# 2020 CALIFORNIA VEGETATION MAP IN SUPPORT OF THE DESERT RENEWABLE ENERGY CONSERVATION PLAN

**Contract L17PD01212**





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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 and Sonoran Deserts 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 1,016,668 acres, spanning the desert portions of Inyo, Kern, and Imperial Counties were mapped between 2018 and 2020 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 2016 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 were 86.23 percent for User's Accuracy, and 87.9 for Producer's Accuracy.

**Keywords:** Bureau of Land Management, vegetation, desert, renewable energy, photointerpretation

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# CHAPTER 1: Introduction

## 1.1 The Mapping Program

The U.S. Bureau of Land Management (BLM) contracted Aerial Information Systems, Inc. (AIS) to continue vegetation classification development and fine-scale vegetation mapping of 1,016,668 acres over four subareas within Inyo, Kern, and Imperial counties of the Desert Renewable Energy Conservation Plan (DRECP) region. The four subareas are designated as Salton Sea South (224,763 acres), Jawbone South (204,133 acres), Owens Valley (392,906 acres), and Picacho (194,866 acres). Work performed is 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). California Native Plant Society (CNPS), as a subcontractor to AIS, conducted any classification development work needed for this project.

The previous 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 six 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 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.

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 only Owens Valley and Jawbone South 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 VegCAMP and CNPS staff. AIS photointerpreters 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. Because the study area fringes on, and includes, non-desert areas, the MMU transitions to the non-desert MMU of 1 acre for upland vegetation, and 1/4 acre for special types such as wetlands, water bodies, etc.

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.

Even though covering two separate contracts, because of the proximity of 2017-19 mapping areas to the current mapping effort, the geodatabases for Jawbone North and South subareas were attached as one final delivery area. In addition, Salton Sea South and the Salton Sea North/Flat-Tailed Horned Lizard subarea geodatabases were also attached for a combined accuracy assessment effort, as well as for geodatabase final delivery. As a result, this report will include some aspects of the Jawbone North, Salton Sea North, and Flat-Tailed Horned Lizard subareas in the discussion.

## 1.2 General Study Area

**Figure 1** below shows the current mapping area; the Jawbone North, Salton Sea North, and the Flat-Tailed Horned Lizard subareas (mapped under separate contract); and the previously mapped areas within the DRECP region.

The current mapping subareas are described below.

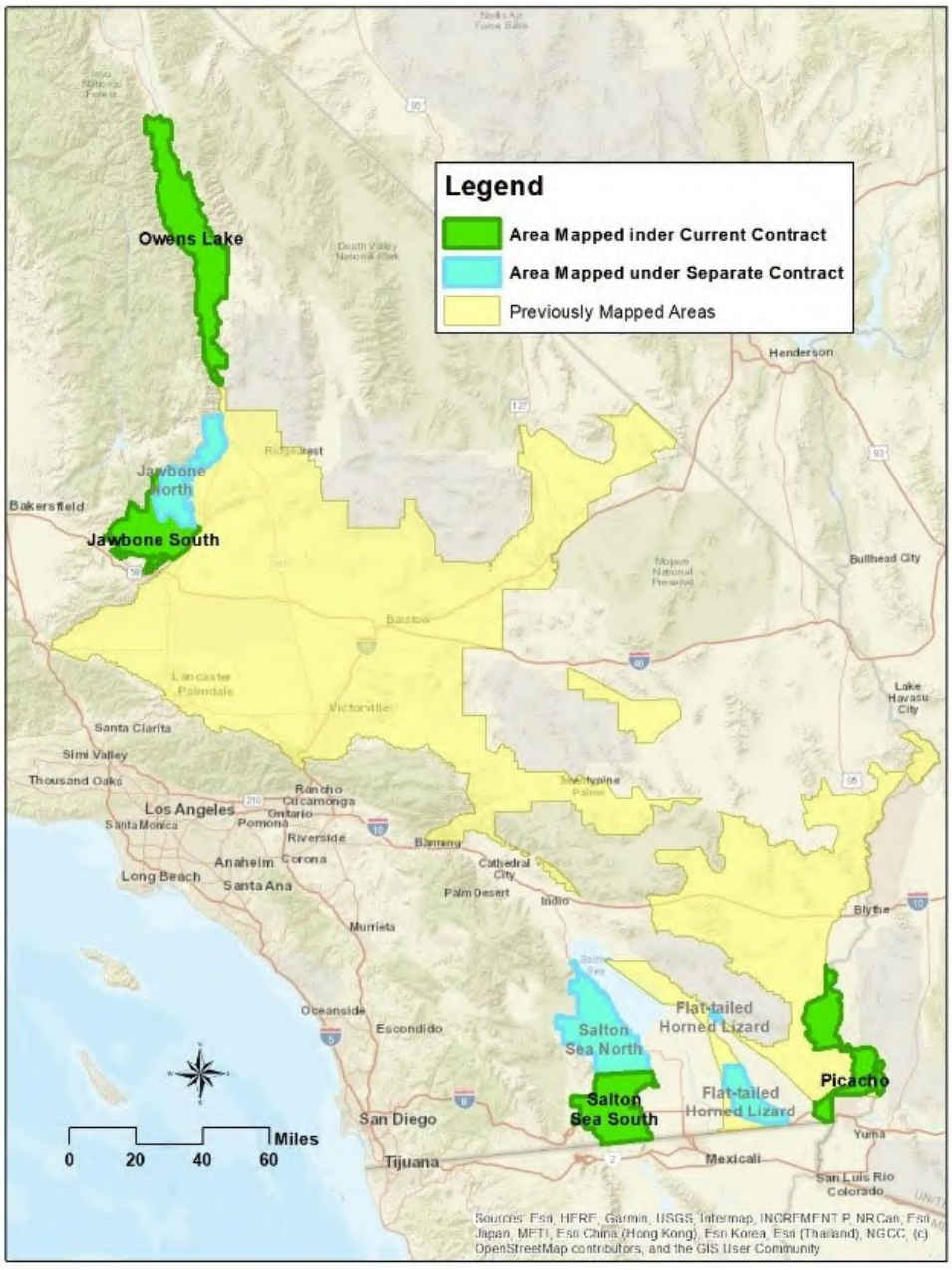
- **Owens Valley** – This subarea falls within the Mojave Desert-Great Basin transition. It is composed of a long north-south trending valley, actually made up of the Owen Valley to the north, that includes the Owens River and Owens Lake; the short Haiwee Reservoir corridor to the south; and the Rose Valley at the southernmost end of the subarea.

  The southern edge of the study area follows the existing DRECP vegetation mapping boundary just north of Wickline Canyon and just south of Little Lake. The western boundary roughly follows the toe of the Sierra Nevada or Inyo National Forest boundary on the upper bajadas northward to the toe of Crater Mountain just south of McMurry Meadows Road. The northern boundary skirts the bottom of Crater Mountain and Fish Springs Hill, heading eastward toward the Fish Springs State Fish Hatchery, then southeast to Tinemaha Reservoir, then east again to the Inyo National Forest boundary. The eastern edge of the study area follows the national forest boundary south to Crystal Ridge, where it then generally follows the upper bajada-toe of the Inyo Mountains southward to just east of Swansea, where it then follows the east edge of the Township-Range line south to just east of Sugar Loaf. At that point, the boundary

follows the upper bajada-toe of the Coso Range southward to the northern Rose Valley cinder cones, where it turns west to go around Red Hill, southward to Little Lake before joining the existing DRECP boundary.

The Owens Valley subarea basically straddles U.S. Highway 395 and includes the towns of Independence, Lone Pine, Olancha, and Little Lake, as well as the Alabama Hills National Scenic Area.

**Figure 1: Location of the Study Area**



- **Jawbone South** – This subarea is in the transition area between the desert foothills and cismontane region of the Sierra Nevada. The eastern portion of the subarea is part of the desert foothills of the southern Sierra Nevada that is also part of the Mojave Desert. The western portion is within the non-desert southern Sierra Nevada proper, but does have some desert influence.

  The eastern edge of the subarea follows the existing DRECP vegetation mapping boundary. The southern and southwestern edge follows the Tehachapi Rail Corridor vegetation mapping boundary. The western and northwestern edge follows a general north to northeastward arc from Menagerie Canyon/Beartrap Spring to the southwest corner of Section 1 of Township 30S Range 33E. It then follows the west edge of Section 1 northward and arcing to the southeast corner of Section 18 of Township 29S Range 33E. From there the boundary turns north to the Sequoia National Forest boundary. The edge of the subarea follows the national forest boundary to the east and north to the bottom of Section 31 of Township 16N Range 35E. The northern edge of the subarea follows the bottom of Section 31 east, then turns north to generally follow the toe of the mountain slope in a north-northeastward arc to Kelso Creek. The boundary follows Kelso Creek southeastward to the edge of the Jawbone North vegetation mapping study area. The subarea edge continues to follow the Jawbone North boundary southward then eastward to the existing DRECP study area boundary.

  The Jawbone South subarea contains the southern end of the Piute Mountains, the upper Jawbone Canyon watershed that flows east to the Mojave Desert, the upper Caliente Creek watershed that eventually flows westward to the Central Valley, and the upper Sand Canyon-Cache Creek watershed that flows south to the Tehachapi Valley.

- **Picacho** – This subarea is located in the southeastern part of California in the Colorado Desert, adjacent to the Colorado River. It includes a piece of the Palo Verde Mountains and Palo Verde Valley at the north end. The main body of the subarea is within the Chocolate Mountains. The southern part includes portions of Pilot Knob Mesa and the Cargo Muchacho Mountains.

  The eastern boundary of the subarea is the California-Arizona state line on the Colorado River. At Fort Yuma Indian Reservation, just north of Laguna Dam it turns northward to the bottom of Section 30 of Township 15S Range 24E, where it turns west to the edge of the Bard subunit of the existing DRECP vegetation mapping boundary. The subarea edge turns north, west, and south around the Bard subunit, then follows the Fort Yuma Indian Reservation boundary to the west and then to the south to the U.S.-Mexico international boundary. There it follows the international boundary west to the Algodones Dunes, where it follows the dune edge northwestward about three miles, then turns northward on Pilot Knob Mesa to the existing DRECP vegetation mapping boundary just southwest of Ogilby Hills at the railroad tracks. The western edge of the subarea follows the existing DRECP boundary northward to the edge of the Palo Verde Valley, where it then stair-steps southeastward roughly along the edge of the Colorado

River floodplain before heading eastward to the Colorado River/state line at the top of Section 36 of Township 9S Range 21E.

The study area includes the Picacho Recreation Lands, and the Picacho State Recreation Area.

- **Salton Sea South** – The subarea is located on the western edge of the Salton Sea Trough, in the Colorado Desert, west of the agricultural lands of the Imperial Valley. It includes the Yuha Basin of the Yuha Desert, the west end of the Coyote Mountains, and West Mesa.

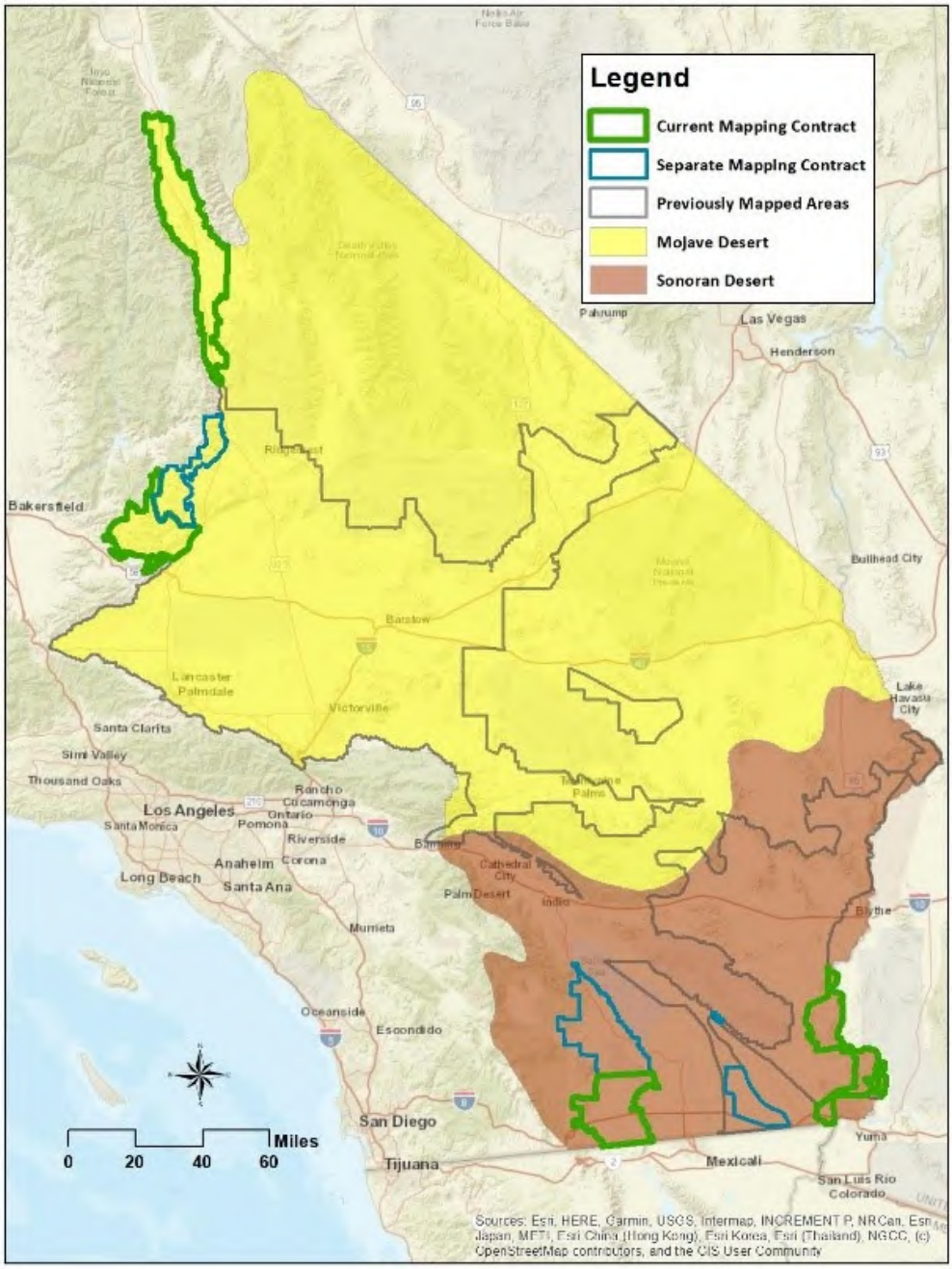
  The southern edge of the subarea follows the U.S.-Mexico international boundary from the Westside Main Canal, westward to the eastern edge of the Jacumba Mountains. The western boundary follows the toe of the Jacumba Mountains north to just west of Ocotillo near Sugarloaf Mountain, where it forms an outward peninsula shape around Sugarloaf Mountain before heading north again to the Coyote Mountains. The boundary forms another peninsula west and north and east around Carrizo Mountain before heading north over the western side of West Mesa to the northern part of Section 21 of Township 14S Range 10E. The northern subarea boundary trends to the east until it reaches the Thistle Canal at the edge of the agricultural lands of the Imperial Valley. It follows the canal south to the New River, where the boundary heads west to the Westside Main Canal, then north and west along the Filaree Canal, then west on an unnamed access road, and south to Filaree Canal. The boundary follows Filaree Canal south to the Westside Main Canal, where it then follows that canal south to West Evans Hughes Highway (Route S80), where it heads eastward on the highway to Jessup Road south to Diehl Road east, to Diehl Drain south, to Wixom Road east, to Drew Road south to the Westside Main Canal. It follows the Westside Main Canal south to the U.S.-Mexico international boundary.

  The Yuha Desert Recreation Lands, and the U.S. Naval Recovery Parachute Test Range are within the study area.

## 1.3 Ecological Regions in the Study Area

The study area covers portions of the Mojave and the Sonoran Deserts, which are shown in **Figure 2.** The following sections describe the different deserts and their ecological regions found within the study area. Finer distinctions of the ecological zones occurring within the two deserts have been defined by AIS photointerpreters based on biogeographical distinctions, which often influence vegetation patterns. This enables the photointerpreter to better understand how vegetation correlates to these variables within each zone.

**Figure 2: The Mojave and Sonoran Deserts within the DRECP Study Area in Southern California**




The Mojave Desert is represented by the yellow shading and the Colorado portion of the Sonoran Desert is in brown shading. The current study area is outlined with the green boundary, the areas mapped under separate contract are displayed with the blue boundary, and the previously mapped DRECP project areas are displayed with the black boundary.

### 1.3.1 The Mojave Desert

***Photo Credit:*** **John Fulton**

The Mojave Desert is the smallest of the four major North American deserts, occupying approximately 16 million acres, mainly in southeastern California. Its boundaries are defined in the west by the southern Sierra Nevada, to the south by the east-west trending Transverse Ranges of coastal southern California, to the east by the Colorado River, and to the north by the basin and range complexes of Nevada and eastern California. It is one of California's largest ecoregions, encompassing approximately 15 percent of the entire state. Portions of the Western Mojave Desert are mapped in the current study area and are described in greater detail later in the report in section 1.3.3 (Defined Regions within the Study Area).

The Mojave is unique in that it is the only desert receiving most of its precipitation in the cooler winter months, where winter cold is severe enough to produce a short dormant season for the natural vegetation. This pattern of precipitation occurring when plants need it least goes into creating a flora unique to the Mojave Desert where Joshua tree *(Yucca brevifolia)* is the characteristic plant of much of the mid- and higher elevations.

### 1.3.2 The Sonoran Desert

The Sonoran Desert is the third largest of the four major North American deserts, occupying approximately 64 million acres, in Arizona, southeastern California, and northwestern Mexico. Its western boundary is defined by the Peninsular Ranges of the Pacific Coast Ranges region. To the north, it is bordered by the Mojave Desert. The portion of the Sonoran Desert in the mapping effort is bounded by the Colorado River to the east and southeast, and by the U.S.-Mexico international border to the south.

The westernmost portion of the Sonoran Desert, falling within the DRECP mapping study, is known more locally as the Colorado Desert or Colorado portions of the Sonora Desert. This region overall receives less precipitation than areas east of the Colorado River, where summer thunderstorms are more frequent. Weather stations located in Indio, Brawley, and Blythe reflect these hyper-arid conditions where precipitation totals range from only 2.8 to 4 inches annually. Contrast this with cities further east, such as Phoenix and Tucson, which receive between 8 and 12 inches yearly.

Several significant vegetation types mapped for this project occur only in the Sonoran Desert portion of the study area. Some of the most representative examples include the extensive stands of blue palo verde (*Parkinsonia florida*) and ironwood (*Olneya tesota*) that occur throughout the region in medium to large washes and as emergent trees to creosote bush (*Larrea tridentata*) scrub. In California's easternmost section, vegetation common to areas in southwestern Arizona reach their westernmost extent in the Whipple and eastern Chocolate Mountains. Stands of foothill palo verde (*Parkinsonia microphylla*) drape the lower foothill slopes east of these mountain ranges as an emergent tall shrub to creosote bush and brittle bush (*Encelia farinosa*). Percent cover of this tall shrub in some areas reach 5-10 percent locally. In addition, individuals of giant saguaro cactus (*Carnegiea gigantea*) occur over widely scattered locations.

***Photo Credit:*** **John Fulton**

The Sonoran Desert can be divided into seven subdivisions, one of which occur within the current mapping area: the Lower Colorado River Valley - *This is also referred to as the Colorado Desert Subdivision in this report.*

Within this subdivision, three zones are defined and described in this report:

- Colorado River Floodplain Zone
- Chuckwalla and Chocolate Mountains Zone
- Salton Sea Trough Zone
    - East Mesa and Sand Hills Subzone
    - Borrego Valley and West Mesa Subzone

### 1.3.3 Defined Regions within the Study Area

The study includes a number of areas with similar environmental characteristics, which AIS refers to as "zones." These zones support different types of vegetation due to a variety of factors including, but not limited to, elevation, topographical characteristics, surface geology and parent material, soil texture and chemistry, and regional and microclimatic patterns. All of these enable the photointerpreters to attain a better understanding of how vegetation reacts under like conditions. The descriptions below are based on areas in the recent mapping efforts. For locational descriptions of previously mapped portions of these subregions, refer to *2013 California Vegetation Map in Support of the Desert Renewable Energy Conservation Plan. Final Report.* (Menke et al., 2013) and *California Vegetation Map in Support of the Desert Renewable Energy Conservation Plan (2014-2016 Additions). Final Report.* (Menke et al., 2016)

### *1.3.3.1 The Western Mojave Desert*

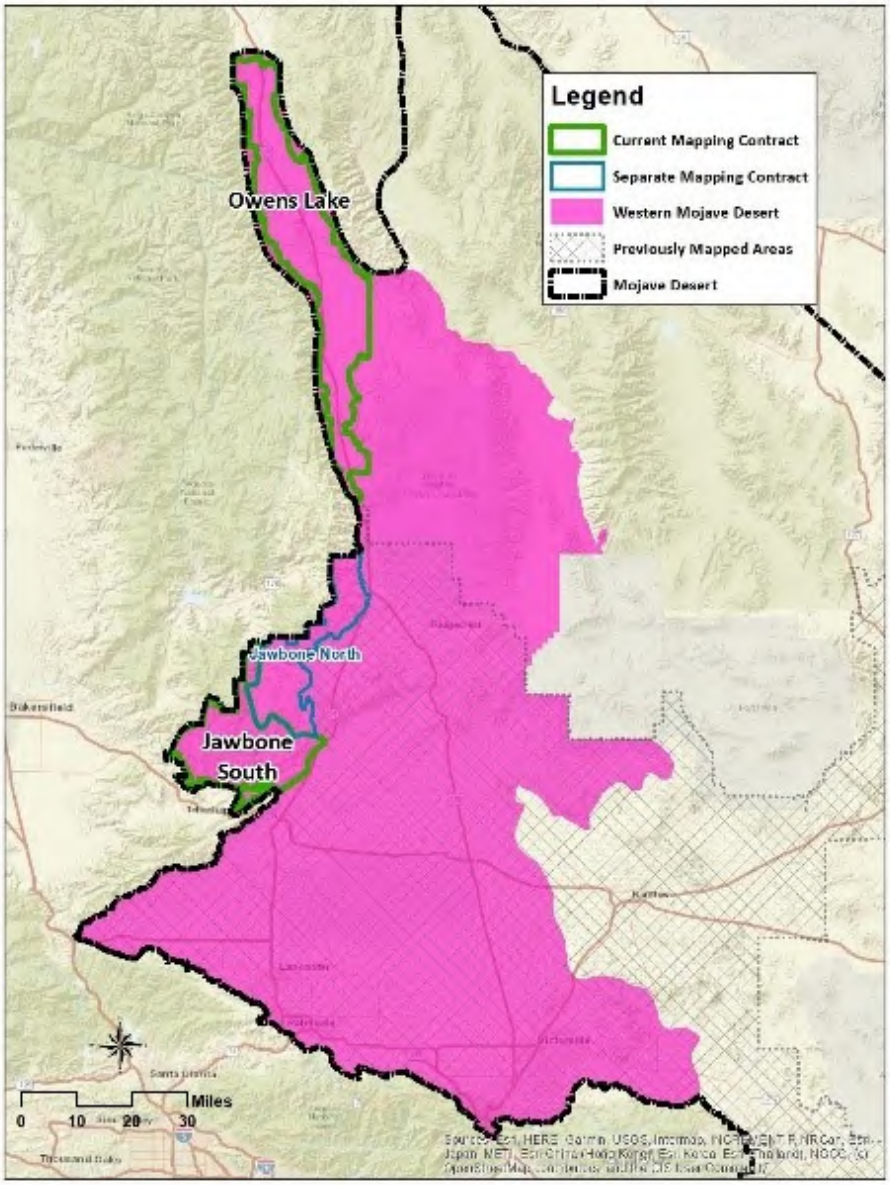
The western portion of the Mojave Desert encompasses over 3.5 million acres of land, (**Figure 3**). In the north, its western margins conform with those of the greater Mojave Desert where the Owens, Rose, and northern Indian Wells Valleys are bounded along the eastern foothills of the southern Sierra Nevada at roughly the 3000-foot to 4500-foot elevation level, about a thousand feet below the tree line. The western margins of the Mojave Desert then bend southwestward along and including the southern foothills of the Sierra Nevada and Tehachapi Mountains just upslope from the Indian Wells and Fremont Valleys where the town of Mojave is located about 20 miles east of Tehachapi Pass. (Although the southern Sierra Nevada is technically in an adjacent Sierra Nevada Ecoregion, for the sake of simplicity, the southern Sierra foothills, acting as a transition from desert to coastal environs, are included in the Western Mojave Desert for this report). The westernmost margins of the Mojave ecoregion converge with four other major ecoregion zones within the state: the Sierra Nevada, Central Coastal Ranges, Central Valley, and the Southern California Transverse Ranges. To the south of the western portions of the Antelope Valley, the region's southern boundary gradually transitions into the low undulating Sierra Pelona along the western edge of the San Gabriel Mountains. To the east, the San Gabriel Mountains, which continue to form the southern boundary, increase in elevation and attain heights over 10,000 feet along the Mt. San Antonio crest. The eastern edges of the Western Mojave Desert are rather indistinct, initially trending northwestward, corresponding roughly with the eastern extent of the Lucerne and North Lucerne Valleys, and the southern base of Stoddard Ridge and Stoddard Mountain. The boundary then runs north, crossing the Mojave River near the town of Helendale and then extends northwest just east of the Iron Mountains and Harper Dry Lake where it again bends eastward to include the Gravel Hills and the Superior Valley in the northern section of the region.

Within the region, precipitation generally decreases from west to east and to a lesser degree from south to north. The region experiences a strong winter rainfall maximum with most areas receiving over 80 percent of their annual precipitation during the winter period from December through March. There is little or no precipitation during the hot summer months, making this area emulate the seasonality of the adjoining non-desert Mediterranean climates.

Elevations average at least a thousand feet higher than the adjoining Central Mojave Region, resulting in at least some seasonal snowfall in much of the region. Record minimum temperatures at or near zero have occurred in most of the cities within the Western Mojave Region and may in part be the cause of southward extensions of such species as big sagebrush *(Artemisia tridentata),* rabbit brush (*Ericameria nauseosa*), shadscale *(Atriplex confertifolia),* and spiny hop sage (*Grayia spinosa*). Growing seasons are reduced in the highest elevations to less than 200 days in some areas.

The Western Mojave contains two zones for the current mapping, which are described below.

**Figure 3: Location of the Western Mojave Desert within the Study Area**



1.3.3.1.1 The Southern Sierra Nevada Transition Zone

***Photo Credit:*** **Edward Reyes**

The Southern Sierra Nevada Transition Zone **(Figure 4)** consists of two subzones, the southern Sierra Nevada desert foothills and the interior southern Sierra Nevada. The southern Sierra Nevada desert foothills subzone includes the eastern slopes of the Piute Mountains, the Kelso Valley, the Jawbone Canyon watershed, and the upper slopes of the Sand Canyon watershed above the Tehachapi Valley. The interior southern Sierra Nevada consists of the upper Caliente Creek watershed, including the Piute Mountains. The Jawbone North and South subareas are part of the Southern Sierra Nevada Transition Zone.

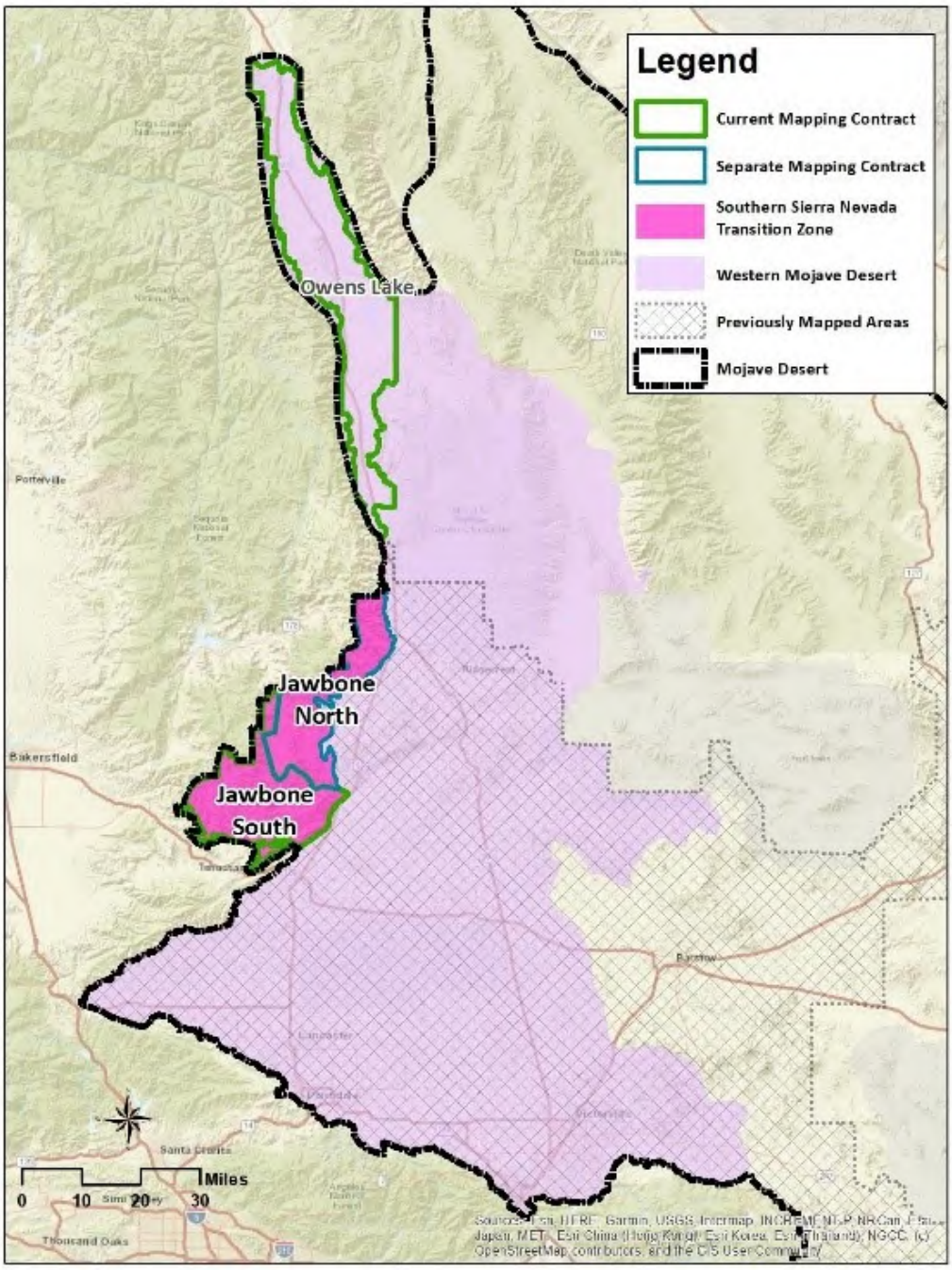
The Southern Sierra Nevada Transition Zone encompasses over 350,000 acres of land **(Figure 4)** ranging in elevation from just over 2000 feet to approximately 7500 feet. The highest and lowest portions of the study area are less than 18 miles from one another. About 1/3 of the subareas lie in cismontane California, mainly south and west of Sorrel Peak. The study encompasses some of the only true stands of montane woodland in the entire DRECP region, characterized by *Pinus jeffreyi* and *Quercus kelloggii* on the higher slopes of the Piute Mountains.

As in most of the DRECP lands, varying degrees of aridity dominate the landscape of this zone, with areas over 10 inches of precipitation limited to the most southwestern portions west of the Scotia Mountains. Over 2/3 of the region is classified as Köppen BWk (cool desert). The driest portions occur in the most northeastern portions, where precipitation falls below 4 inches annually, in the rain shadow of the 8400-foot Owens Peak in the southern Sierra Nevada. Further south, precipitation increases along the desert fringe to 5-8 inches due to the lower elevations and lessening effects of the rain shadow east of the Scotia Mountains. As with much of the Mojave and Colorado Deserts, *Larrea tridentata* and *Ambrosia dumosa* dominate these hyperarid conditions. Increasing elevations on the leeward side of the Sierra Nevada & Scotia Mountains give way to extensive stands of *Coleogyne ramosissima,* where winter precipitation occasionally falls in the form of light snow.

West of the summits of these ranges, plants reflect a Köppen Csa climate, defined by a short winter rainy season and long hot, dry summers. Traveling west over the cismontane divide, stands of *Quercus john-tuckeri* begin to occur on gentle to moderately-steep northwest-trending

slopes. Stands of *Juniperus californica* intermix and also occur in pure stands in slightly steeper settings. Much of this portion of the study area falls within the Desert – Mediterranean winter rainy season transition as exemplified by plants such as *Yucca brevifolia*, *Pinus sabiniana*, *Artemisia tridentata,* and *Eriogonum fasciculatum* occurring within eyesight of one another, often in the same stand.

**Figure 4: Location of the Southern Sierra Nevada Transition Zone within the Study Area**



1.3.3.1.2 The Mojave Desert - Basin and Range Fringe Zone

***Photo Credit:*** **John Fulton**

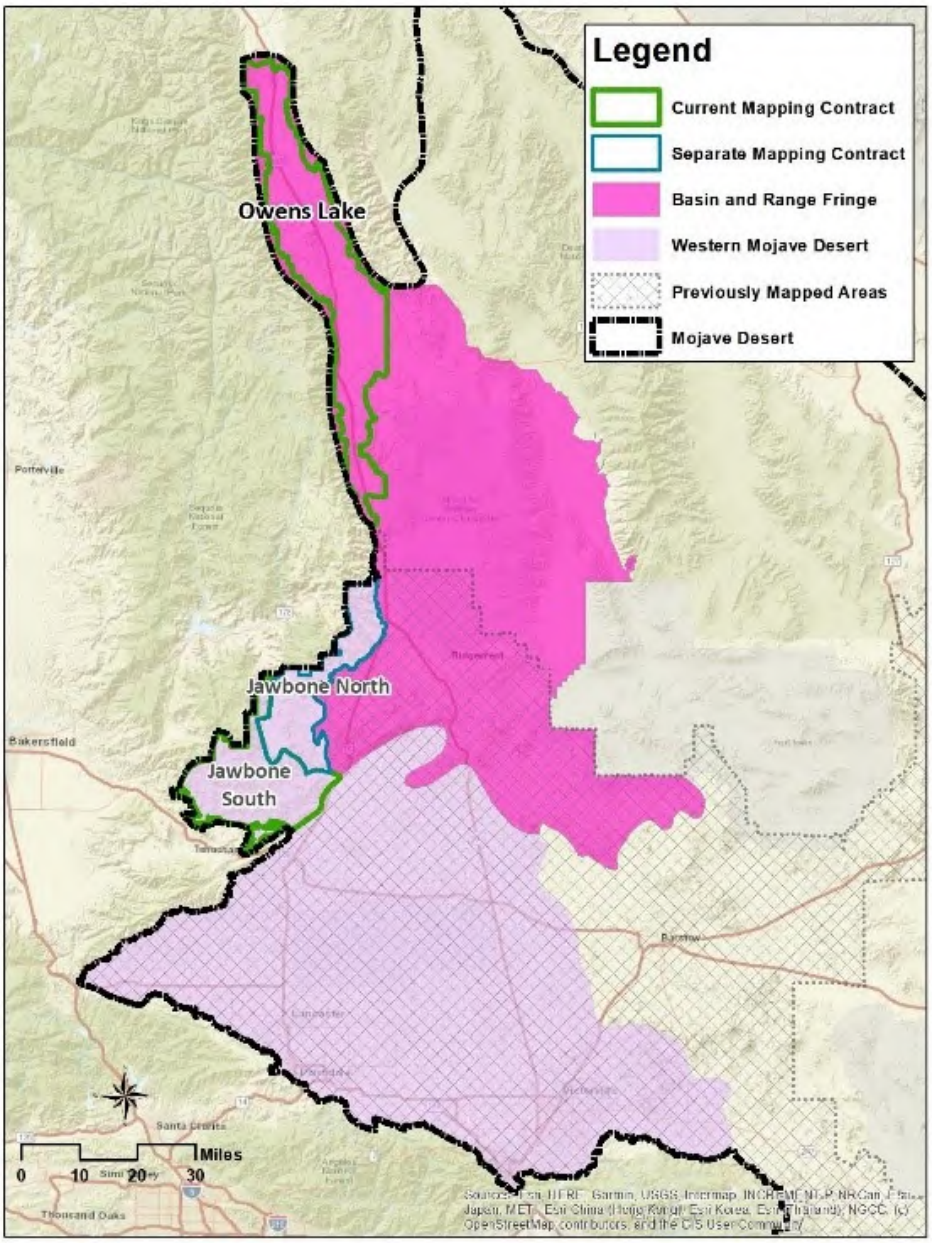
As its name implies, the Mojave Desert - Basin and Range Fringe Zone (**Figure 5**) is a transition between two major ecoregions. The zone is defined based on its physical proximity to the north-south trending ranges immediately adjacent to the north. As in much of the western Mojave, winter cold is an important factor in the presence of cooler climate alliances more commonly found in the Great Basin. The Mojave Desert - Basin and Range Fringe typifies the species composition found further south in the Antelope Valley. However, rain shadow effects along the Sierra Nevada crest are more severe, precluding the development of any extensive stands of California juniper or dense Joshua tree woodlands, commonly found along the foothill desert edges of the San Gabriel Mountains further south. The boundaries of this portion of the Western Mojave are indistinct in places since they include mountains that share structural characteristics of both the Mojave Desert and the Great Basin. These ranges include the El Paso, Rand, Lava, Coso, and Summit Mountains, all of which trend southwest to northeast, eventually tying into the north-south running Inyo Mountains, Argus Range, Owens Valley, and adjacent Searles and Panamint Valleys to the north. The most prominent features within this portion of the Western Mojave are the El Paso Mountains, attaining elevations over 5000 feet, and the adjacent Indian Wells and Owens Valleys to the north, just east of southern Sierra Nevada.

Vegetation within the Owens Valley exemplifies a transition between two desert climates, one defined by summer heat and one by winter cold. Species common to the Mojave Desert such as *Yucca brevifolia, Ambrosia dumosa, A. salsola,* intermingle or are adjacent in close proximity to species more frequently found in the cooler Great Basin, including *Betula occidentalis, Artemisia tridentata, Atriplex confertifolia, Sarcobatus vermiculatus*, and *Purshia tridentata.* The region includes some of the northernmost stands of *Larrea tridentata* just east of the town of Independence on the fans adjacent to the Inyo Mountains. Conversely, some of the southernmost stands of *Sarcobatus vermiculatus* were identified south of Owens Lake near the town of Olancha.

Extensive stands of creosote bush occur within the Indian Wells Valley just west of the Naval Air Weapons Station China Lake. The China Lake vicinity contains an extensive area of alkaline types including allscale *(Atriplex polycarpa)*, shadscale, iodine bush *(Allenrolfea occidentalis)*, and bush seepweed *(Suaeda moquinii)*. Upslope along the margins and lower slopes of the El Paso Mountains, spiny hop sage becomes a dominant understory species to a sparse overstory of

Joshua tree. Further west, on moderately sloping pediment surfaces extending below the eastern Sierra foothills, black brush *(Coleogyne ramosissima)* dominates the shrub layer in cover ranging upwards of 25 to 30 percent. A small gap in the massive Sierra Nevada crest just outside the region along the Walker Pass allows for an unusual combination of foothill pine (a species of the western Sierra Nevada Foothills and California Coastal Ranges) and Joshua tree to co-occur in small stands. The elevation of a small portion of this zone drops below 2000 feet near the Trona Pinnacles, where shadscale, desert holly *(Atriplex hymenelytra)* and bush seepweed are found on alkali settings of the southern Searles Valley.

**Figure 5: Location of the Mojave Desert – Basin and Range Fringe Zone within the Study Area**



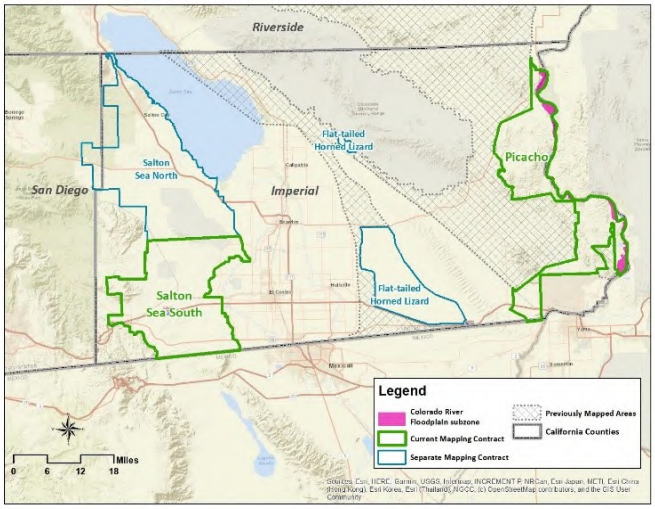
*1.3.3.2 The Colorado River Floodplain Zone of the Lower Colorado River Valley Subdivision of the Sonoran Desert*

***Photo Credit:*** **John Fulton**

This zone occurs within the Lower Colorado River Valley subdivision of the Sonoran Desert portion of the study area. For the current mapping effort (**Figure 6**) this zone is limited primarily to a narrow corridor along the Colorado River east of the Chocolate Mountains. It is found in the Picacho subarea. For the most part, the zone averages significantly less than a mile in width. Nearly all the zone's vegetation is determined by its proximity to the Colorado River rather than by the scant rainfall that is characteristic of the entire region's climate.

Some of the desert's mesquite (*Prosopis glandulosa*) bosques occur within this region, occupying extremely narrow stands along the breakpoint between the active floodplain and adjacent bluff. Stands of tamarisk (*Tamarix* spp.) thickets have replaced native riparian vegetation throughout the active floodplain. However, tamarisk is also often a significant component of mappable stands of naturally occurring riparian vegetation, including arrow weed *(Pluchea sericea)* thickets along with mesquite and various chenopod scrub stands. Much of the vegetation on the active floodplain has undergone multiple disturbances where early replacement stands include species such as bush seepweed, quail bush (*Atriplex lentiformis),* and arrow weed. On some of the hypersaline sites, iodine bush occurs in patches.

**Figure 6: Location of the Colorado River Floodplain Zone within the Study Area**



### *1.3.3.3 The Salton Sea Trough Zone of the Lower Colorado River Valley Subdivision of the Sonoran Desert*

This zone **(Figure 7)** is the only area in the mapping effort where significant portions fall below sea level. The zone experiences fewer days below freezing than any other region within the DRECP mapping area. Precipitation is extremely low with all three nearby weather stations (Brawley, El Centro, and Indio) averaging less than 3 ½ inches annually. The zone corresponds to the greater Imperial Valley, which includes the agricultural region surrounding and south of the Salton Sea, as well as the eastern and western mesas. For this mapping effort, there are two subzones, the East Mesa-Sand Hills Subzone, and the Little Borrego Valley-West Mesa Subzone.

***Photo Credit:*** **John Fulton**

The East Mesa and Sand Hills Zone consists of the sandy areas southwest of Pilot Knob Mesa in what is known as the Sand Hills and Algondones Dunes. Is also includes the sandy East Mesa region just east and adjacent to the agricultural Imperial Valley of the Salton Sea Trough. The zone borders the U.S.-Mexico international boundary on the south. The southern unit of the Flat-Tailed Horned Lizard subarea (completed under separate contract) occupies the southern three-quarters of the East Mesa portion of the zone.

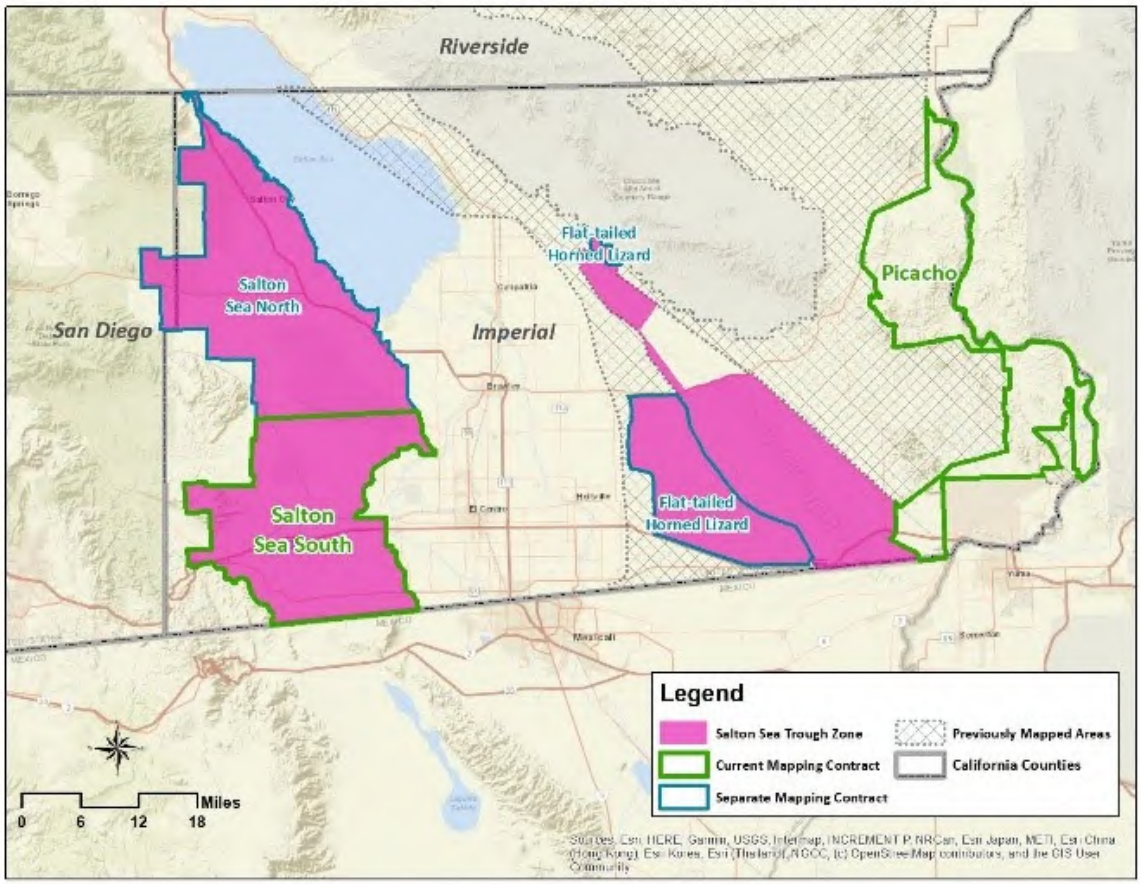
The Little Borrego Valley and West Mesa Zone is located west of the Salton Sea and the agricultural Imperial Valley of the Salton Sea Trough. It is bounded on the west by the Jacumba, Coyote, Santa Rosa, and Fish Creek Mountains. The zone consists of geomorphic units of West Mesa, Little Borrego Valley, Superstition Hills, Superstition Mountain, Yuha Basin, and the Yuha Desert. The zone is bounded on the south by the U.S.-Mexico international boundary, and on the north by the Coachella Valley. The Salton Sea North (completed under separate contract) and Salton Sea South subareas area located in this subzone.

Vegetation occurring upslope on the bajadas reflects this hyperarid setting, resulting in woody plant cover averaging less than 5 percent, especially in the alkaline “mud hills” in the both the East Mesa and West Mesa subzones. On gently sloping bajadas above the ancient lake bed, the landscape is dominated by large areas of continuous sandy substrate. In these highly permeable settings, stands of creosote bush are frequently lacking the typical understory low shrub

component of white bursage. Species better adapted to this setting, such as longleaf joint-fir (*Ephedra trifurca*), frequently co-dominate, and at times, form stands on their own.

The eastern edge of the West Mesa subzone and the west edge of the East Mesa subzones is dominated by riparian and wetland vegetation associated with the higher water table and numerous canals that cross the landscape. In these areas, nonnative species such as *Tamarix* (*ramosissima* or *chinensis*) and ravennagrass (*Saccharum ravennae*) occur in close proximity to native vegetation composed of arrow weed scrub and common reed (*Phragmites australis*) in narrow bands often following the margins of the canals.

**Figure 7: Location of the Salton Sea Trough Zone within the Study Area**



### *1.3.3.4 The Chuckwalla and Chocolate Mountains Zone of the Lower Colorado River Valley Subdivision of the Sonoran Desert*

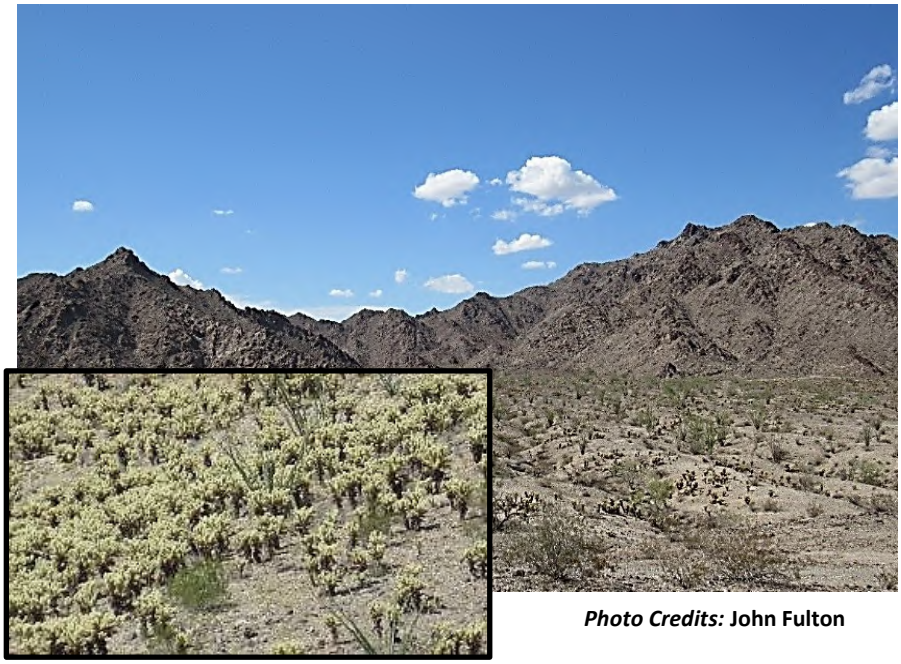


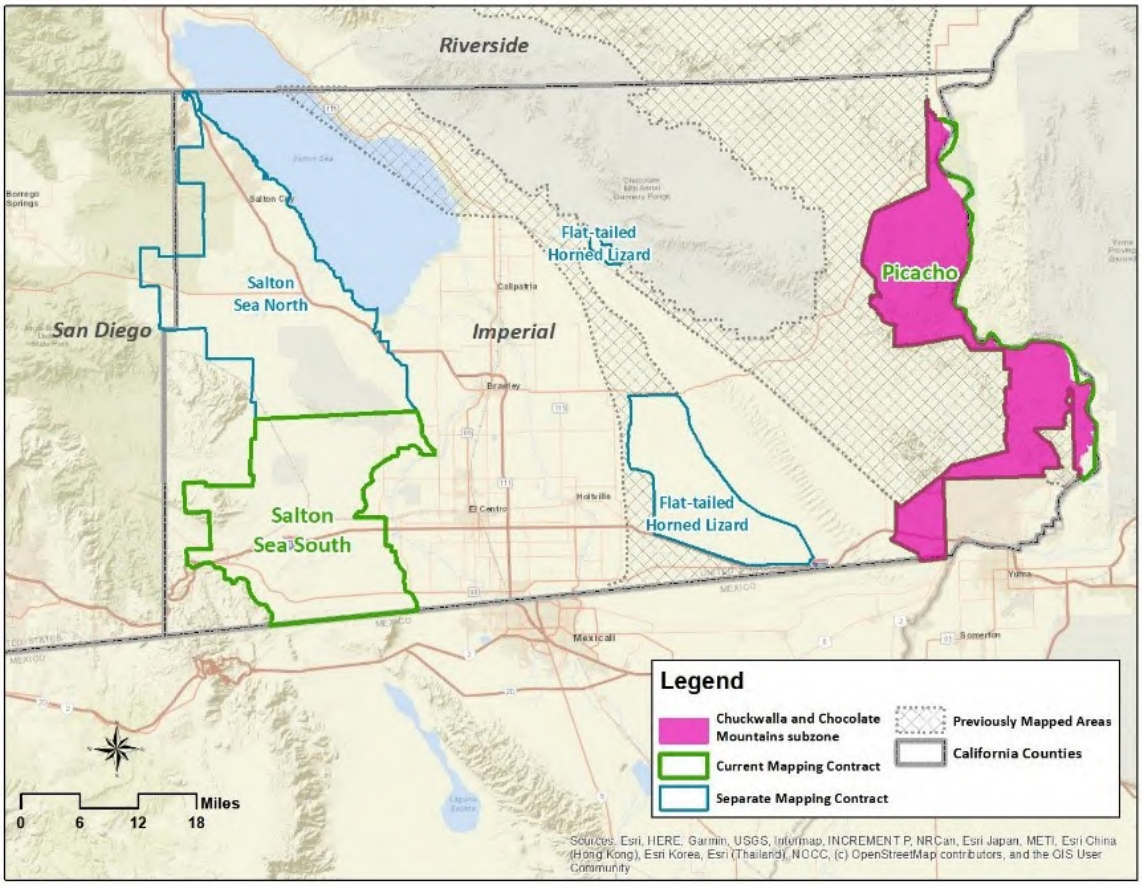
***Photo Credits:*** **John Fulton**

The Chuckwalla and Chocolate Mountains Zone **(Figure 8)** encompasses the entire Chuckwalla Range southeastward to include the Palo Verde Mountains and the Chocolate Mountains, as well as the bajadas of the Chuckwalla Bench and Pilot Knob Mesa. The Picacho subarea encompasses land stretching across the eastern Chocolate Mountains south of and including the easternmost part of the Palo Verde Mountains, the Cargo Muchacho Mountains, and Pilot Knob Mesa. Elevations range from below 100 feet on Pilot Knob Mesa, to over 2000 feet at Peter Kane Mountain in the north.

On the mid and upper fans and adjacent low toe slopes of the Chuckwalla Range, in settings above 2500 feet (760 meters), conditions are favorable for mid-elevation desert species such as Mojave yucca (*Yucca schidigera*) to attain a cover density greater than 1-2 percent, and thus be mappable. In this same general area, along drier margins of Milpitas Wash, small patches of the rare Munz's cholla (*Cylindropuntia munzii*), in stands well under an acre, were observed during field reconnaissance.

Further south, on cobble-strewn upper fans and toe slopes of the Chocolate Mountains, vast stands strongly dominated by teddy bear cholla (*Cylindropuntia bigelovii*) stretch across the landscape in continuous stands, several of which are nearly 1000 acres in size. Within the numerous washes bisecting the lower bajadas of this zone, extensive stands dominated by blue palo verde and ironwood continue uninterrupted in bands frequently stretching over 5 miles long. This zone contains more than 75,000 acres mapped to this dual-species wash Alliance.

**Figure 8: Location of the Chuckwalla and Chocolate Mountains Zone within the Study Area**



# 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. Then the project staff of experienced photointerpreters conducted field reconnaissance visits to prepare for the photointerpretation effort. Using geographic information system (GIS) technology, they 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 accuracy assessment (AA) procedures were implemented prior to finalizing the geodatabase. A more detailed discussion of these methodology components follows.

Note that the mapping of the Salton Sea South subarea immediately followed the mapping of the Salton Sea North and the Flat-Tailed Horned Lizard subareas, which were mapped under a separate contract. Since the two project areas contain similar vegetation types and are adjacent or in close proximity of one another, it was decided that, for efficiency sake, that the three subareas should be combined as one large mapped area for Accuracy Assessment (sample allocation and data collection).

## 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 10.6 file geodatabase format.

### 2.2.2 Imagery

The digital orthophoto base for the mapping project was 1-meter NAIP imagery (true-color and color-infrared). For the Owens Valley, Salton Sea South, and Picacho subareas, the imagery date was 2016, and 2018 for the Jawbone South subarea. Another set of true-color digital imagery available through ArcGIS online (variable dates depending on scale viewed) was used as supplemental imagery to aid in the vegetation mapping effort. The vegetation mappers were able to bring this georeferenced imagery set directly into their ArcMap sessions.

The photointerpreters 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, which was helpful in assessing long-term trends and varying phenological appearances of the vegetation. The Google Maps and Bing Maps street view option was sometimes used where available. Although these supplemental sources were used,

all delineations, in addition to all floristic and structural attributes, were based on the 2016 or 2018 NAIP base imagery as previously stated.

However, in some instances, photointerpreters 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. Polygon 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 photointerpreters 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 CDFW or partnering agencies, were used regularly throughout the mapping effort:

1. Anza Borrego Vegetation Map – downloaded from data.gov
2. BLM Travel Routes – Images (jpgs) provided by El Centro BLM
    - North Central Imperial County
    - Western Imperial County
    - Eastern Imperial County
3. Botanical Survey Onyx Ranch – provided by CDFW
4. CalFIRE – downloaded from http://frap.cdf.ca.gov/data/frapgisdata-subset.php
5. CA State Geology Maps – downloaded from http://datagateway.nrcs.usda.gov
6. Digital Elevation Models – via ArcGIS Online
7. DRECP Vegetation Map (Menke et al., 2013; and Menke et al., 2016) – received from CDFW
8. Federal Lands – downloaded from http://www.nationalatlas.gov/atlasftp.html
9. Geology_USGS – downloaded from http://ngmdb.usgs.gov
10. Indian Lands – downloaded from  for http://www.nationalatlas.gov/atlasftp.html
11. Jawbone_Onyx Ranch Botanical Survey 2101211112 – provided by CDFW
12. Kiavah Wlderness Specimens 2017-11-30 – provided by Naomi Fraga (California Botanic Garden)

13. Microphyll Map (2012) – received from CDFW
14. Owens Peak Specimens 2017-11-30 – provided by Naomi Fraga (California Botanic Garden)
15. Owens Valley
    - Owens Valley Vegetation parcels 84-87 – provided by Zach Nelson (Inyo County)
    - Line-Point Data - provided by Zach Nelson (Inyo County)
    - Lower Owens Valley Floodplain Map – provided by Zach Nelson (Inyo County)
    - Tributaries - provided by Zach Nelson (Inyo County)
    - Owens Valley Solar Energy Study (OVSES) - provided by Zach Nelson (Inyo County)
    - Soils - provided by Zach Nelson (Inyo County)
    - Manzanar National Historic Site Vegetation Mapping Inventory – downloaded from https://irma.nps.gov/DataStore/Reference/Profile/2177195
16. Roads
    - Owlshead GPS Routing – downloaded from owlsheadgps.com
    - WECO – provided by BLM
    - GTLF – provided by CDFW and BLM
    - OHV Routes – provided by CNPS
17. Surface Management Area – provided by BLM
18. Tehachapi Rail Corridor Vegetation Map – provided by CDFW
19. Tehachapi Rail Corridor Survey Points – provided by CDFW
20. Topographic map Digital Raster Graphics – via ArcGIS Online
21. Wetlands – downloaded from http://www.fws.gov/wetlands/Data/State-Downloads.html
22. 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 System (NVCS).

### 2.3.1 Data Collection for Classification

CNPS collected classification samples in two of the project's study areas, i.e., Jawbone South and Owens Valley, 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 proximate 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 between May and July 2018. However, new data collection was limited in funding to one week in Owens Valley and four weeks in the Jawbone South area.

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, we supplemented 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 2018, CNPS compiled other available vegetation sampling data from the region upon contacting partners for information. We selected data found within the ecological subsections that overlap with the Jawbone South and Owens Valley study areas. This included data from the USGS Mojave Desert Ecosystem project (Thomas et al. 2004), groundwater-monitoring transect data from Los Angeles Department of Water and Power (LADWP) and Inyo County, 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 Jawbone South and Owens Valley 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 |
| Central Mojave | US Geological Survey | Plots, Fixed area (0.1 ha) | 514 |
| Chimney and Erskine Fire Areas | CNPS and BLM | Transects, AIM method (3-50 m and subplots) | 30 |
| Death Valley | National Park Service | Plots, Fixed area (0.1 ha) and Invasive plant area assessments | 719 |
| Eastern California | Michelé Slaton (US Forest Service) | Plots, Fixed area (800 $m^2$ tree, 400$m^2$ shrub, 100 $m^2$ herb) | 800 |
| Fish Slough | Dept. of Fish & Wildlife | Rapid assessments, Relevés, and Map verifications | 110 |
| Jawbone South | **CNPS** | Rapid assessments and Relevés | 84 |
| Owens Valley | **CNPS** | Rapid assessments and Relevés | 32 |
| Owens Valley | LADWP and Inyo County | Transects, Monitoring (averaged per area) | 208 |
| Owens Valley | So. CA Edison Contractors | Rapid assessments | 8 |
| Tehachapi Corridor | Dept. of Fish & Wildlife | Rapid assessments | 57 |

### 2.3.2 Data Analysis for Classification & Vegetation Key, Descriptions

Upon compiling data in related projects, CNPS co-analyzed the various datasets to classify vegetation from Jawbone South, Owens Valley, 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 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 photointerpreting and delineating polygons. Field testing of the vegetation key was performed during the field reconnaissance for the mapping stage of the Jawbone South and Owens Valley subareas in 2019. 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 non-vegetated mappable units that are not included in the floristic vegetation classification, such as sand, rock, mud, etc., or individual classes that are not mappable due to MMU constraints but consistently occur together on the ground as ecologically related complexes. 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 only for the Jawbone South and Owens Valley subareas. It was determined that the Salton Sea South and Picacho subareas were similar enough to the existing DRECP classification that no additional floristic classification work was needed. The map classification was based on the original DRECP mapping project (Menke et al., 2013, and Menke et al., 2016), which 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 (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 VegCAMP staff for possible floristic classification revision.

## 2.5 Field Reconnaissance

Field reconnaissance/verification visits serve two major functions. First, they enable photointerpreters 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 accuracy assessment. In addition, with guidance from ecologists in the field, the photointerpreters become familiar with the flora, vegetation assemblages, and local ecology of the study area. At the same time, ecologists gain understanding from the photointerpreters' perspective about assessing vegetation through the framework of map creation.

Between January 2018 and August 2019, AIS conducted eleven field reconnaissance trips dispersed throughout the mapping area with one crew per trip. The trips are summarized in **Table 2**.

**Table 2: Summary of Field Reconnaissance Trips**

| Trip No. | Dates | Staff from: | Location |
|---|---|---|---|
| 1 | January 15-18, 2018 | AIS | Salton Sea South |
| 2 | March 5-9, 2018 | AIS/CNPS | Owens Valley - Uplands |
| 3 | April 30-May 4, 2018 | AIS/VegCAMP | Owens Valley - Wetlands |
| 4 | May 21-23, 2018 | AIS | Salton Sea South |
| 5 | October 8-11, 2018 | AIS/CNPS/VegCAMP | Jawbone South |
| 6 | November 7-9, 2018 | AIS | Picacho |
| 7 | March 4-7, 2019 | AIS | Picacho |

| Trip No | Dates | Staff from: | Location |
|---|---|---|---|
| 8 | April 22-25, 2019 | AIS | Jawbone South – Desert Foothills |
| 9 | May 20-24, 2019 | AIS | Owens Valley |
| 10 | June 17-20, 2019 | AIS | Jawbone South |
| 11 | August 5-8, 2019 | AIS | Owens Valley |

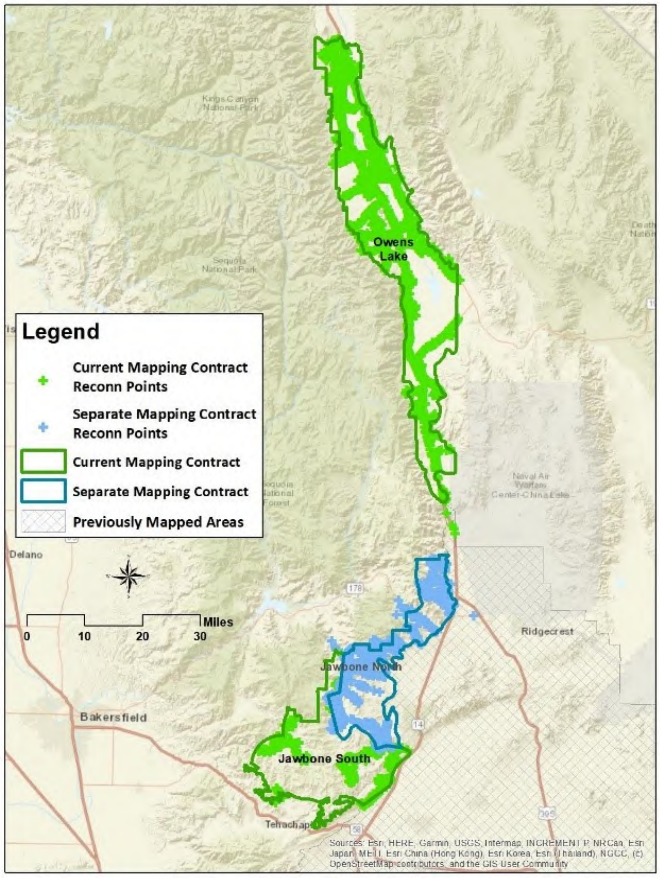
Prior to each trip, AIS staff reviewed imagery on-screen to identify and select potential reconnaissance sites in close proximity to roads. Sites were selected to represent different vegetation types and percent cover, as well as variations in geography, landform, and abiotic factors such as percent slope, aspect, shape of the slope, and elevation. Multiple sites were chosen to provide alternatives in case one or more sites were to prove inaccessible. Project staff created hardcopy plots of the base imagery and annotated them with road information to help with navigation in the field. The plots were usually generated at a scale of 1:26,000, with a few areas also plotted at 1:12,000 to provide more detail. AIS staff planned field routes to maximize the number of vegetation types and ecological regions visited while taking into consideration time constraints and accessibility. In addition to the hardcopy plots, the field crew also 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 4WD vehicles 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 photointerpreters 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 determined using a compass and laser rangefinder. Field crew members recorded each location visited on a GPS unit and logged pertinent information in the Collector app on the tablet.

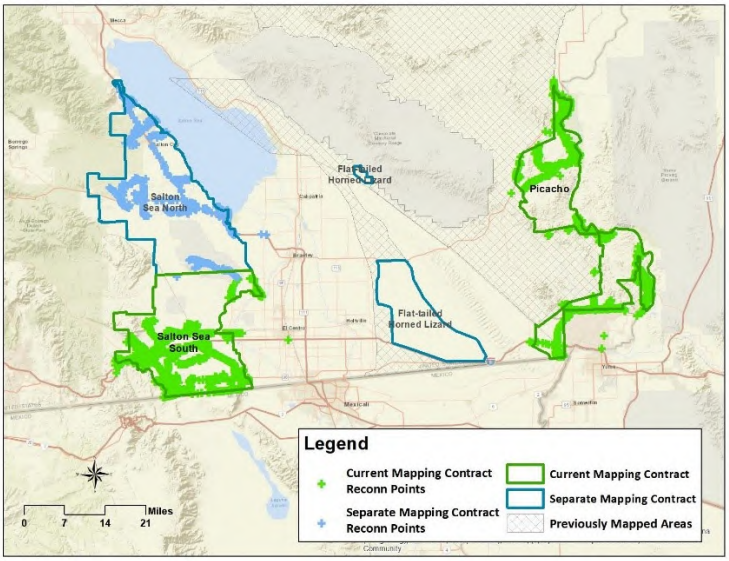
At many observation points, the crew took digital color ground photos. The photo number, photo direction, corresponding field point, and other pertinent information were recorded and available for reference during the mapping effort. The field data and ground photos were essential for correlating conditions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

Field crews from AIS collected over 10,200 reconnaissance observations as shown in **Figure 9**.

**Figure 9: Location of Reconnaissance Observation Points**




North Subareas




South Subareas

## 2.6 Photointerpretation Mapping Procedures

There are two distinct aspects of the photointerpretation mapping process. In what can be called the "photointerpretation process," the photointerpreter 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 photointerpreter 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 photointerpreted. 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 photointerpreter 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.

The detailed descriptions of each vegetation type found in Appendix B include numerous examples of the types of information the photointerpreters 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 photointerpreters 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 modules that corresponded to USGS 1:24,000 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 photointerpreters had at their disposal a suite of standard and custom ArcMap tools to facilitate the creation of polygons. The photointerpreters generally viewed the imagery at scales ranging from 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, photointerpreters 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.

Photointerpreters 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 menu enabled code 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 Alliances are found in a particular hierarchical grouping. Once the geodatabase neared completion, the numeric code values were replaced with the actual vegetation type names.

The modules were edge-matched and checked for invalid codes and topology errors. As mapping progressed, 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 accuracy assessment 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 be riddled with discrepancies, as different staff members 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 photointerpreters 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 126 types that were mapped, composed of 93 Alliances and Alliance-level types such as Provisional Alliances, Semi-natural Stands, and Mapping Units; 7 Sub-alliance-level types, such as Associations, Sub-alliance, and Sub-alliance Mapping Units; and 14 miscellaneous classes relating to features such as agriculture, water, and urban disturbance; and 12 Macrogroup and Group level types. When the photointerpreter 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 Vegetation Mapping 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, 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 acres, 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 criteria applies to the Jawbone South and Owens Valley subareas. Jawbone South transitions from the desert foothills to the interior southern Sierra Nevada with watersheds draining westward to the Central Valley. In Owens Valley there is a transition from the valley desert vegetation to the higher elevation Sierra Nevada vegetation. In addition the Owens River floodplain was mapped to the 1/4 acre criteria due to its setting being more non-desert-like.

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. AIS made exceptions to map wetland types below the MMW in order to capture the vegetation along the Colorado River and the canals in the Imperial Valley area. The appropriate MMUs were still observed. As an example, because of the highly fractured and disturbed characteristics of the wetland and riparian vegetation associated with (nearby and adjacent to) canals, the vegetation there was mapped to a 15 meter MMW, which is half the DRECP project standard width for riparian and wetland vegetation. 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.

2.6.3.1.2 Miscellaneous Classes

The relationship between vegetation and land use is sometimes complicated. 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 the housing as well as showing the continuity of a natural vegetation community. 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 photointerpreter 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 layer within a stand. Cover is the primary metric used to quantify the importance or abundance of a life form and/or species.

Photointerpreters 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 *2012 Vegetation Map in Support of the Desert Renewable Energy Conservation Plan, Interim Report 1.1* (VegCAMP, 2012).

To determine the vegetative cover, photointerpreters 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.

Photointerpreters 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 photointerpreters 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.

#### 2.6.3.2.1 Percent Cover Mapping Considerations

It is important to note that the photointerpreters 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 layers which were obscured by overstory layers 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 trees, 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 photointerpreters 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 aerial photography mission is flown influences the percent cover assigned to vegetation types. Subsequent field verification and accuracy assessments 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*

Photointerpreters 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 *2012 Vegetation Map in Support of the Desert Renewable Energy Conservation Plan, Interim Report 1.1* (VegCAMP, 2012), presents the map classes for Exotics.

**Table 4: Map Classes for Exotics**

| Code | Range | Discussion |
|---|---|---|
| 0 | None visible | 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. |
| 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. |

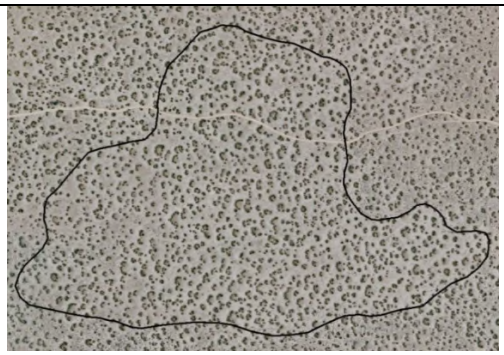
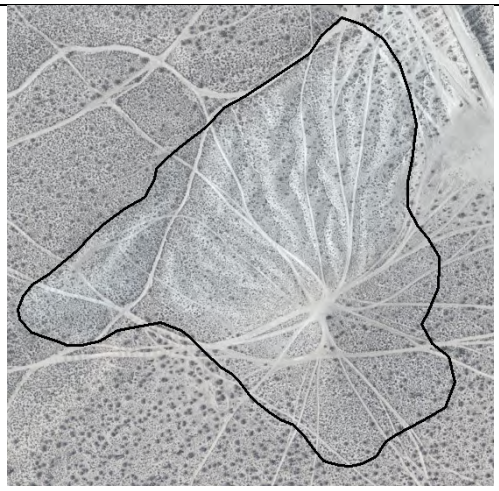
#### *2.6.3.4 Roadedness Disturbance*

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 aqueduct. 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 (2012). 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.

The Roadedness Disturbance code reflects the combination of the amount 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.

**Table 5: Map Classes for Roadedness Disturbance**

| Code | Range | Example |
|---|---|---|
| 0 | None visible | |
| 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. |

### *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 Appendix F of *2013 California Desert Vegetation Map and Accuracy Assessment in Support of the Desert Renewable Energy Conservation Plan* (VegCAMP, 2013), presents the map classes for Development Disturbance.

**Table 6: Map Classes for Development Disturbance**

| Code | Range | Discussion |
|---|---|---|
| 0 | None visible | 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, grazing, 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 Appendix F of VegCAMP (2013).

**Table 7: Map Classes for Anthropogenically Altered Disturbance**

| Code | Range | Discussion |
|---|---|---|
| 0 | None visible | 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, shrub cover, tree 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.

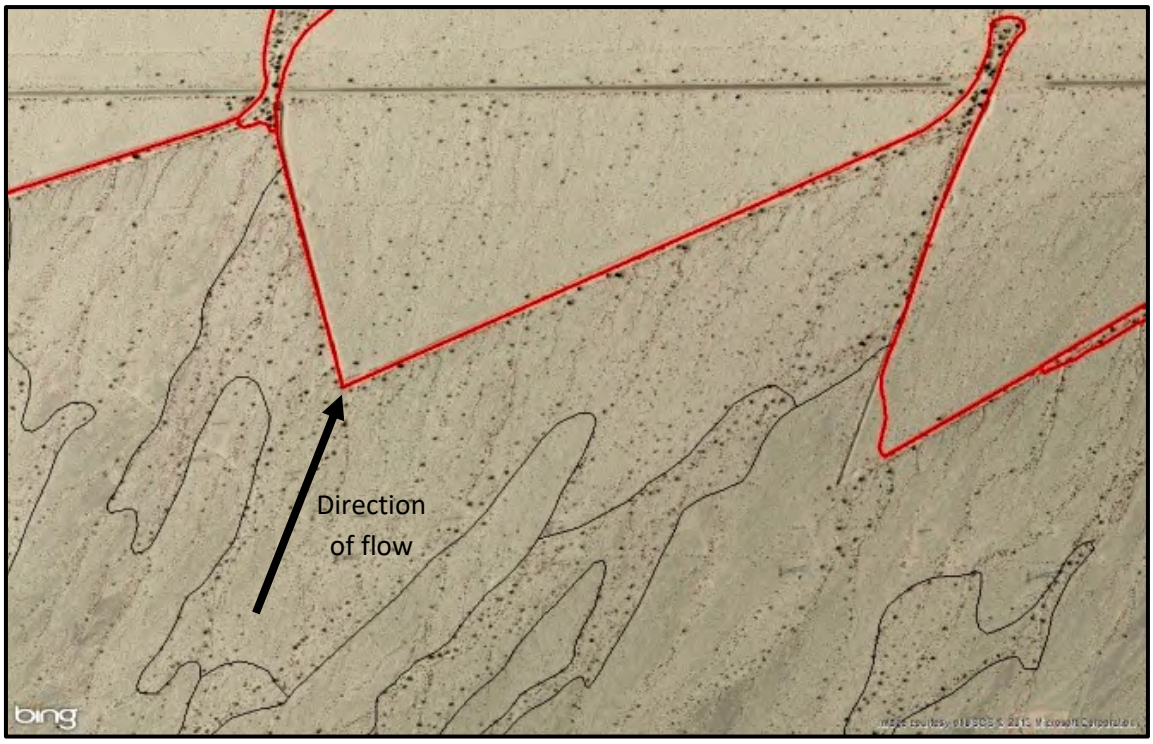
Since the Altered Hydrologic Regime Modifier was applied only where mappable changes in vegetation type or cover were observed across an impediment, an existing polygon was not split solely because part of it was subject to a diversion of surface flow. The map classes for Altered Hydrologic Regime Modifier 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 10** presents an example of polygons coded with the Altered Hydrologic Regime Modifier.

**Figure 10: Example of Polygons 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).

### *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 photointerpreters 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 11** presents an example where the modifier was applied, and **Table 9** summarizes the map classes.

**Figure11: 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 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 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 Impoundment 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).

The Wildlife Preserves and Sanctuaries (1850) land use code denotes managed wetlands.

#### *2.6.3.10 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 accuracy assessment 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
3 - Field Verification
4 - Photo Interpretation
5 - Adjacent Stand: Information or Ground Photo
6 - Reconnaissance (current project)
7 - Other Information
8 - Older Plot Data
9 - Older Recon Data
10 - Accuracy Assessment
60 - Additional Recon Information

### 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, photointerpreters 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 photointerpreter. 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, each photointerpreter reviewed 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. The same held true for edge-matching to the area previously mapped for DRECP.

When all the modules in a subarea unit were joined together, a senior photointerpreter reviewed the data for registration of linework to the base imagery and for code accuracy and consistency. Automated final checks were again conducted for invalid codes and code field 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 in each subarea. 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% of its area has to be viewed, however, usually >50% of area is viewed. For each AA survey, the location of the survey was marked using a GPS device (i.e. iPad, Trimble, 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 & AIS 2013). 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 photointerpreters. Two forms of accuracy (users' and producers') can be

estimated from the data (Story and Congalton 1986). Users' 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). Producers' 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. Producers' accuracy may inform the mappers how well a mapping class can be detected by the photointerpreters (Story and Congalton 1986, Lea and Curtis 2010). Both users' and producers' accuracy were calculated. Once a subarea had been scored, the accuracy assessment results were reviewed by senior photointerpreters. In some cases, the photointerpreter 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 photointerpreters then revised the polygons based on the AA results.

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.

**Table 10. Accuracy Assessment (AA) 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 |
| 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 |

| Code | Reason for Score | Score |
|---|---|---|
| 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 |

# CHAPTER 3: Results

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

## 3.1 Floristic Classification

For two of the four subareas, CNPS staff collected 84 new surveys in the Jawbone South area and 33 new surveys in the Owens Valley area in the spring–summer of 2018. Staff then compiled over 2,700 other samples along these new surveys to develop a comprehensive classification for the region. The classification analysis resulted in recognizing 72 Alliances and 135 associations within the Jawbone South and Owens Valley 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 photointerpreters to map at that finer scale, sometimes higher-level groups or macrogroups were mapped instead of Alliances (e.g., California annual & perennial grassland Macrogroup, or California annual forb/grass vegetation Group instead of *Monolopia (lanceolata) – Coreopsis (calliopsidea)* 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, 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: *Atriplex parryi* Association was combined into the *Sarcobatus vermiculatus* Alliance, *Isocoma acradenia* Association was combined into the *Suaeda moquinii – Isocoma acradenia* 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, three wash scrub Alliances were merged into the *Acacia greggii – Hyptis emoryi – Justicia californica* Alliance, two other wash scrub Alliances that also occur in post-burn sites were merged into the *Prunus fasciculata – Salazaria mexicana* Alliance, two riparian scrub Alliances were merged into the *Baccharis emoryi – Baccharis sergiloides* Alliance, and two riparian wooded-scrub Alliances were merged into the *Prosopis glandulosa – Prosopis velutina – Prosopis pubescens* Alliance. The classification also resulted in redefining of Alliance concepts, including a post-burn type of *Ceanothus greggii – Fremontodendron californicum* Alliance.

## Table 11. Vegetation Classification (at the Alliance Level) in the Jawbone South and Owens Valley Subareas, Organized by Lifeform

| Life-form | Map Unit | Vegetation Type | OWVA | JAWB | Classif. Descrip. |
|---|---|---|---|---|---|
| **Woodland & Forest Types** | | | | | |
| | 1212 | *Abies concolor* Alliance | | x | |
| | 1116 | *Aesculus californica* Alliance | | x | x |
| | 1511 | *Alnus rhombifolia* Forest Alliance | | x | |
| | 1611 | *Eucalyptus* spp.– *Ailanthus altissima*– *Robinia pseudoacacia* Semi-natural Alliance | x | x | x |
| | 1122 | *Juniperus californica* Alliance | | x | x |
| | 1213 | *Pinus jeffreyi* Alliance | x | x | x |
| | 1311 | *Pinus monophylla* Alliance | x | x | x |
| | 1121 | *Pinus sabiniana* Alliance | | x | x |
| | 1414 | *Platanus racemosa* Alliance | | x | |
| | 1411 | *Populus fremontii – Fraxinus velutina – Salix gooddingii* Alliance | x | x | x |
| | 1512 | *Populus trichocarpa* Alliance | x | | x |
| | 4222 | *Prosopis glandulosa – Prosopis velutina – Prosopis pubescens* Alliance | | x | x |
| | 1113 | *Quercus chrysolepis* (tree) Alliance | x | x | x |
| | 1111 | *Quercus douglasii* Alliance | | x | x |
| | 1118 | *Quercus kelloggii* Alliance | | x | x |
| | 1112 | *Quercus lobata* Alliance | | x | |
| | 1114 | *Quercus wislizeni* Alliance | x | x | x |
| | 1416 | *Salix gooddingii – Salix laevigata* Alliance | x | x | x |
| | 5423 | *Yucca brevifolia* Alliance | x | x | x |
| **Shrubland Types** | | | | | |
| | 4111 | *Ambrosia dumosa* Alliance | x | x | x |
| | 7211 | *Ambrosia salsola – Bebbia juncea* Alliance | x | x | x |
| | 2111 | *Arctostaphylos glauca* Alliance | | x | |
| | 2117 | *Arctostaphylos viscida* Alliance | | x | x |
| | 5311 | *Artemisia tridentata* Alliance | x | x | x |
| | 5111 | *Atriplex canescens* Alliance | x | x | x |
| | 5112 | *Atriplex confertifolia* Alliance | x | | x |
| | 3722 | *Atriplex lentiformis* Alliance | x | | x |
| | 4113 | *Atriplex polycarpa* Alliance | x | x | x |
| | 1423 | *Baccharis emoryi – Baccharis sergiloides* Alliance | x | x | x |
| | 1422 | *Baccharis salicifolia* Alliance | | x | x |
| | 1521 | *Betula occidentalis* Alliance | x | | x |
| | 3212 | *Ceanothus cordulatus – Ceanothus integerrimus* Alliance | | x | |
| | 2116 | *Ceanothus cuneatus* Alliance | | x | x |
| | 3316 | *Ceanothus greggii – Fremontodendron californicum* Alliance | x | x | x |
| | 2123 | *Ceanothus oliganthus – Ceanothus leucodermis* Alliance | | x | |
| | 5441 | *Cercocarpus ledifolius* Alliance | | x | |

| Life-form | Map Unit | Vegetation Type | OWVA | JAWB | Classif. Descrip. |
|---|---|---|---|---|---|
| | 2131 | *Cercocarpus montanus* Alliance | | x | x |
| | 5421 | *Coleogyne ramosissima* Alliance | x | x | x |
| | 1522 | *Cornus sericea – Rosa woodsii – Ribes* spp. Alliance | x | | x |
| | 5211 | *Encelia (actoni, virginensis) – Viguiera reticulata* Alliance | x | x | x |
| | 4211 | *Ephedra californica – Ephedra trifurca* Alliance | | x | |
| | 5419 | *Ephedra nevadensis - Lycium andersonii - Grayia spinosa* Alliance | x | x | x |
| | 5417 | *Ephedra viridis* Alliance | | x | x |
| | 2214 | *Ericameria linearifolia – Cleome isomeris* Alliance | | x | x |
| | 5217 | *Ericameria nauseosa – Atriplex lentiformis* Mapping Unit | x | | x |
| | 5212 | *Ericameria nauseosa* Alliance | x | x | x |
| | 4213 | *Ericameria paniculata* Alliance | x | x | |
| | 5416 | *Ericameria teretifolia* Alliance | x | x | x |
| | 2221 | *Eriogonum fasciculatum – (Viguiera parishii)* Alliance | x | x | x |
| | 2226 | *Eriogonum fasciculatum* Alliance | | x | x |
| | 2222 | *Eriogonum wrightii–Eriogonum heermannii–Buddleja utahensis* Alliance | | x | x |
| | 1425 | *Rhus trilobata – Crataegus rivularis – Forestiera pubescens* Alliance | x | x | x |
| | 3811 | *Frangula californica* Alliance | | x | |
| | 4115 | *Larrea tridentata - Ambrosia dumosa* Alliance | x | x | x |
| | 4119 | *Larrea tridentata* Alliance | x | x | |
| | 4212 | *Lepidospartum squamatum* Alliance | | x | x |
| | 7212 | *Prunus fasciculata – Salazaria mexicana* Alliance | x | x | x |
| | 4219 | *Psorothamnus fremontii – Psorothamnus polydenius* Alliance | x | | x |
| | 5422 | *Purshia tridentata – Artemisia tridentata* Alliance | x | x | x |
| | 3312 | *Quercus john-tuckeri* Alliance | | x | x |
| | | *Quercus wislizeni* (shrub) Alliance | | | x |
| | 3313 | *Quercus palmeri* Alliance (now Association of *Quercus cornelius-mulleri*) | | x | |
| | 3211 | *Ribes quercetorum* Provisional Alliance | | x | x |
| | 1424 | *Salix exigua* Alliance | x | | x |
| | 1427 | *Salix lasiolepis* Alliance | x | x | x |
| | 5511 | *Sarcobatus vermiculatus* Alliance | x | | x |
| | 7411 | *Suaeda moquinii – Isocoma acradenia* Alliance | x | | x |
| | 1432 | *Tamarix* spp. Semi-natural Stands | x | | |
| | 1428 | *Vitis arizonica – Vitis girdiana* Alliance | | x | x |
| | 2210 | Central and south coastal California seral scrub Group | | x | |
| | 4110 | Lower bajada & fan Mojavean-Sonoran desert scrub Group | x | | |
| | 1420 | Southwestern North American riparian/wash scrub Group | x | | |
| **Herbaceous Types** | | | | | |
| | 5431 | *Achnatherum speciosum* Alliance | | x | |
| | 3713 | *Anemopsis californica–Helianthus nuttallii–Solidago spectabilis* Alliance | x | x | x |
| | 3122 | *Aristida purpurea – Elymus elymoides – Poa secunda* Alliance | | | x |

| Life-form | Map Unit | Vegetation Type | OWVA | JAWB | Classif. Descrip. |
|---|---|---|---|---|---|
| | 3715 | *Bolboschoenus maritimus, Schoenoplectus americanus* Mapping Unit | x | | x |
| | 2331 | *Brassica tournefortii – Malcolmia africana* Semi-natural Stands | | x | |
| | 3111 | *Bromus tectorum – Taeniatherum caput-medusae* Semi-natural Stands | | | x |
| | 2217 | *Corethrogyne filaginifolia – Eriogonum (elongatum, nudum)* Alliance | | x | x |
| | 3512 | *Cressa truxillensis – Distichlis spicata* Alliance | | | x |
| | 6121 | *Dicoria canescens - Abronia villosa – Panicum urvilleanum* Alliance | x | | |
| | 3726 | *Distichlis spicata* Alliance | x | x | x |
| | 3119 | *Eleocharis (palustris, rostellata)* Alkaline-Saline Alliance | | | x |
| | 3611 | *Juncus arcticus (var. balticus, mexicanus)* Alliance | x | x | x |
| | 3614 | *Mimulus (guttatus)* Alliance | | | x |
| | 2314 | *Monolopia (lanceolata) – Coreopsis (calliopsidea)* Alliance | x | | x |
| | 3718 | *Schoenoplectus americanus* Alliance | | | x |
| | 3412 | *Schoenoplectus (acutus, californicus)* Alliance | x | | x |
| | 3712 | *Sporobolus airoides–Muhlenbergia asperifolia–Spartina gracilis* Alliance | x | | x |
| | 3416 | *Typha (angustifolia, domingensis, latifolia)* Alliance | x | x | x |
| | 3410 | Arid West freshwater emergent marsh Group | x | | |
| | 2305 | California annual & perennial grassland (Native component) Mapping Unit | | x | |
| | 2310 | California annual forb/grass vegetation Group | x | | |
| | 3510 | Californian mixed vernal pool/swale/plain bottomland Group | | x | |
| | 3610 | Californian warm temperate marsh/seep Group | | x | |
| | 3110 | Vancouverian and Rocky Mountain naturalized annual grassland Group | x | | |
| | 3700 | Warm Semi-Desert/Mediterranean Alkali-Saline Wetland Macrogroup | x | | |
| | 3600 | Western North America Wet Meadow & Low Shrub Carr Macrogroup | | x | |
| | 5430 | Southern Great Basin semi-desert grassland Group | | x | |
| **Sparsely Vegetated Types** | | | | | |
| | 6111 | *Atriplex hymenelytra* Alliance | x | | |
| | 6117 | *Chorizanthe rigida - Geraea canescens* Desert Pavement Alliance | x | | x |
| | 7111 | *Ephedra viridis – Chrysothamnus viscidiflorus – Rhus trilobata* Alliance | | | x |
| | 6113 | Mud Hills sparsely vegetated ephemeral herbs Mapping Unit | x | | |
| | 6110 | North American warm desert bedrock cliff and outcrop Group | x | | |
| | 6116 | Sparsely vegetated playa (Ephemeral annuals) | x | | |
| | 6120 | North American warm desert dunes and sand flats Group | x | | |

## 3.2 Mapping

For acreage counts by vegetation type for each subarea, refer to Appendix C.

## 3.3 Accuracy Assessment

The accuracy of mapped polygons for the subareas was assessed at different times by CNPS staff, based on when AIS produced the draft vegetation maps. Due to the timing of the Salton

Sea North and Flat-Tailed Horned Lizard subarea mapping (under separate contract) with the completion of Salton Sea South subarea (current contract), it was determined that the three areas would be combined into one area for AA purposes, and sample allocation, AA data collection, and AA scoring would be conducted together. The locations, timing, and number of AA field surveys are summarized below in **Table 12**. 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 the **Figures 12 – 15** 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 |
|---|---|---|---|---|
| Salton Sea & Flat-Tailed Horned Lizard Habitat | November 2018 | 130 | 122 | 118 |
| Picacho | November 2019 | 125 | 114 | 110 |
| Owens Valley | October 2019 | 156 | 152 | 148 |
| Jawbone South | October 2019 to May 2020 | 167 | 147 | 145 |

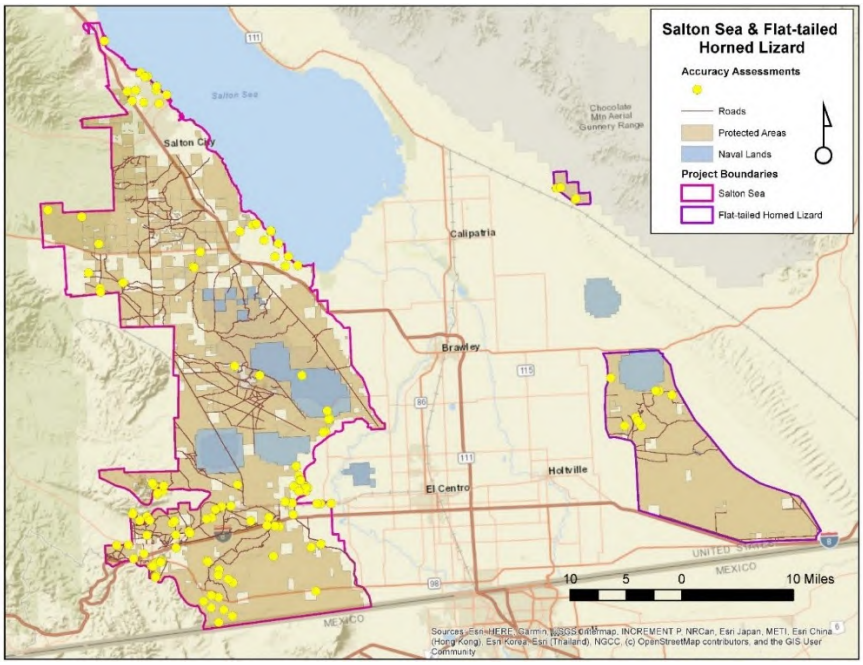



**Figure 12: Map of the AA Survey Locations for Salton Sea & Flat-tailed Horned Lizard Areas**

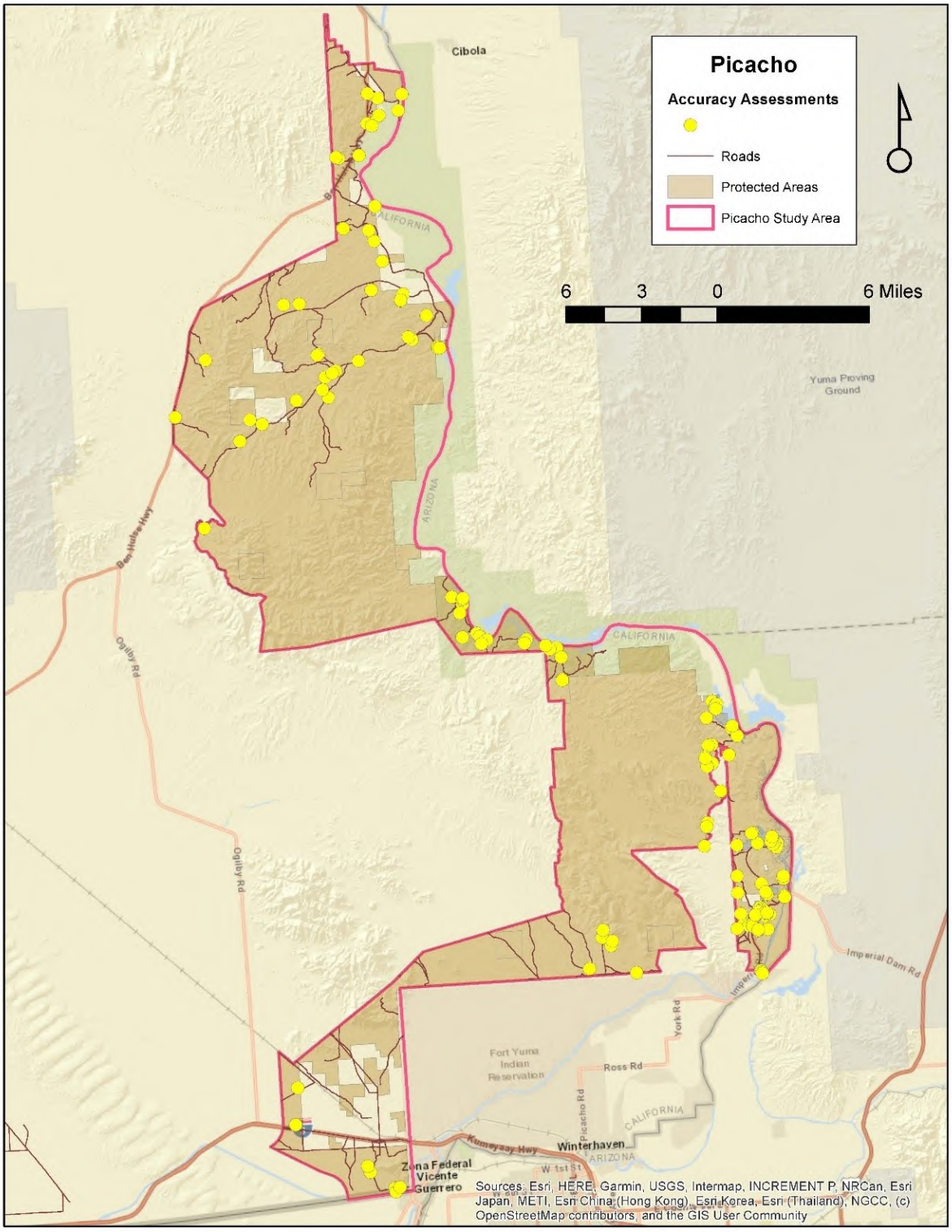



**Figure 13: Map of the AA Survey Locations for Picacho Subarea**

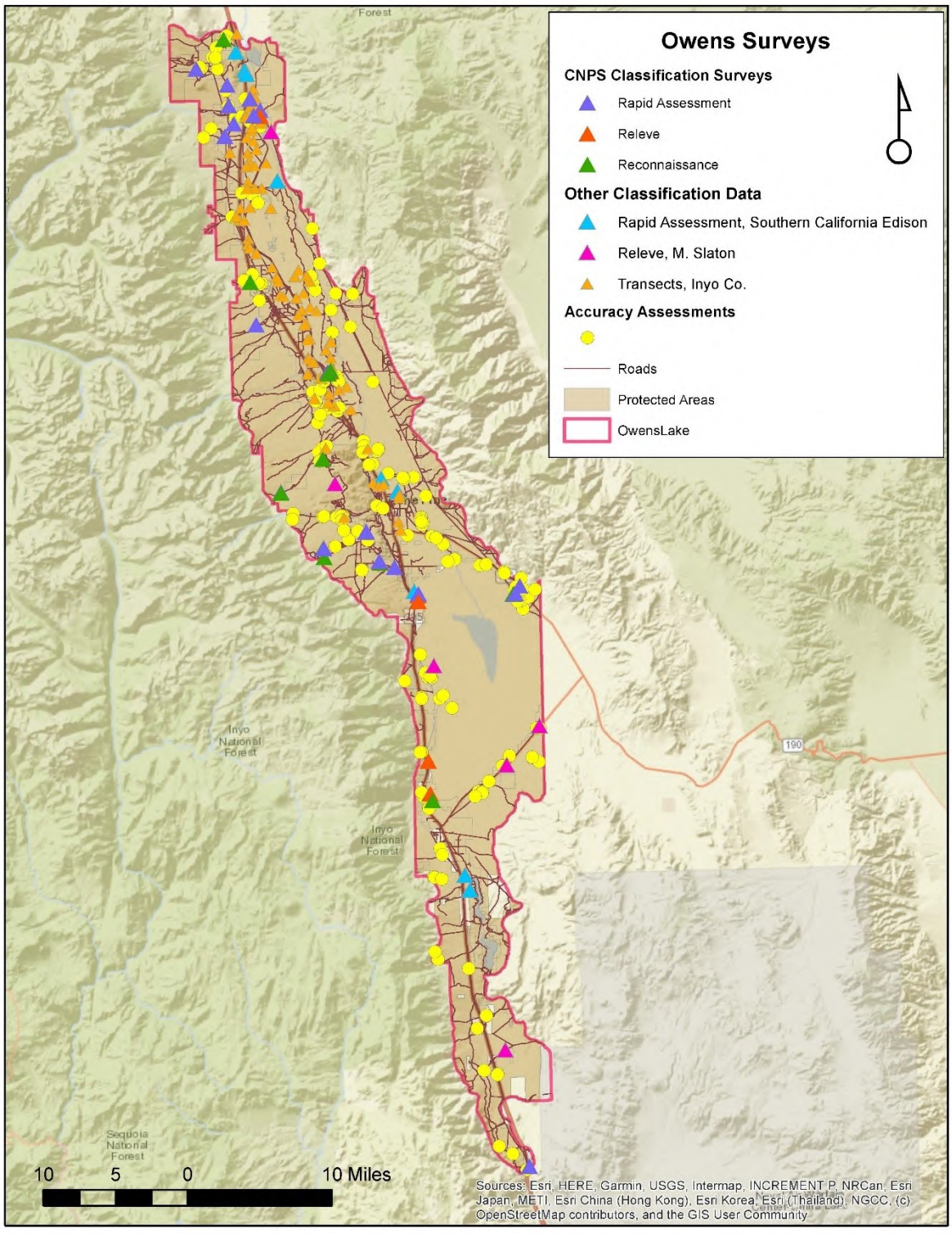



**Figure 14: Map of the AA Survey Locations for Owens Valley Subarea**

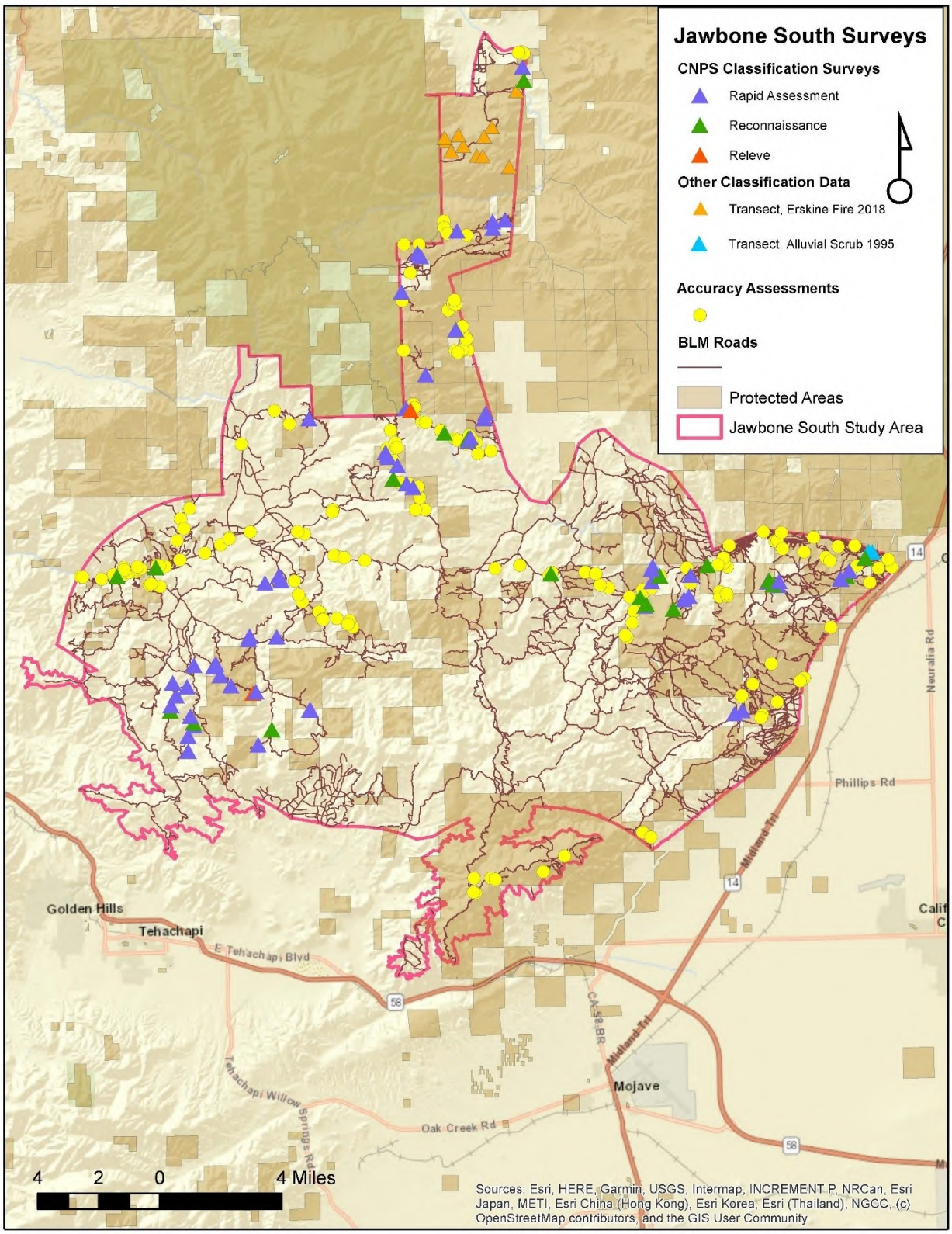



**Figure 15: Map of the AA Survey Locations for Jawbone South Subarea**

The AA field data were analyzed by CDFW-VegCAMP staff to verify accuracy of the vegetation maps. The resulting calculated percent accuracy for each area was greater than 80% overall. Tables with AA scores for each area are provided the **Tables 13 – 16** below.

Also, contingency tables displaying assessed types by users (Field assessed types) and producers (PI types) for this accuracy assessment are included in Appendix J. 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 photointerpreters (producers). Numbers on the diagonal are correct calls by the photointerpreters. These contingency tables display the numbers of assessed polygons by type, and does not include fuzzy scores.

**Table 13. Accuracy Assessment Scores for the Salton Sea North, Salton Sea South, and Flat-Tailed Horned Lizard Subareas**

| Map Unit | Map_Class | Users' Count | Users' Accuracy | Producers' Count | Producers' Accuracy |
|---|---|---|---|---|---|
| 4226 | Acacia greggii – Hyptis emoryi – Justicia californica Alliance | 4 | 90 | 3 | 93.3 |
| 3721 | Allenrolfea occidentalis Alliance | 7 | 94.3 | 7 | 97.1 |
| 4111 | Ambrosia dumosa Alliance | 1 | 100 | 6 | 80 |
| 7211 | Ambrosia salsola – Bebbia juncea Alliance | 3 | 93.3 | 5 | 84 |
| 5111 | Atriplex canescens Alliance | 3 | 73.3 | 1 | 80 |
| 6111 | Atriplex hymenelytra Alliance | 1 | 80 | 0 | - |
| 3722 | Atriplex lentiformis Alliance | 3 | 100 | 5 | 88 |
| 4224 | Chilopsis linearis Sub-alliance | 1 | 100 | 1 | 100 |
| 6117 | Chorizanthe rigida – Geraea canescens Desert Pavement Alliance | 15 | 85.3 | 7 | 94.3 |
| 6121 | Dicoria canescens – Abronia villosa – Panicum urvilleanum Alliance | 4 | 100 | 5 | 96 |
| 4114 | Encelia farinosa Alliance | 1 | 80 | 2 | 80 |
| 3728 | Isocoma acradenia Association | 5 | 100 | 8 | 92.5 |
| 4119 | Larrea tridentata Alliance | 3 | 93.3 | 4 | 90 |
| 4115 | Larrea tridentata – Ambrosia dumosa Alliance | 6 | 93.3 | 6 | 93.3 |
| 4118 | Larrea tridentata – Encelia farinosa Alliance | 5 | 96 | 6 | 93.3 |
| 4110 | Lower bajada & fan Mojave–Sonoran desert scrub Group | 1 | 80 | 0 | - |
| 2330 | Medit. California naturalized annual & perennial grassland Group | 1 | 40 | 0 | - |
| 6113 | Mud Hills sparsely vegetated ephemeral herbs Mapping Unit | 7 | 94.3 | 6 | 96.7 |
| 6110 | North American warm desert bedrock cliff and outcrop Group | 2 | 100 | 4 | 90 |
| 6120 | North American warm desert dunes and sand flats Group | 1 | 60 | 0 | - |
| 4227 | Parkinsonia florida – Olneya tesota Alliance | 5 | 100 | 8 | 90 |
| 3411 | Phragmites australis Association | 1 | 80 | 0 | - |
| 4122 | Pleuraphis rigida Alliance | 5 | 88 | 3 | 100 |
| 4221 | Pluchea sericea Alliance | 6 | 86.7 | 4 | 90 |
| 4222 | Prosopis glandulosa – P. velutina – P. pubescens Alliance | 4 | 100 | 4 | 100 |
| 4225 | Psorothamnus spinosus Sub-alliance | 10 | 98 | 9 | 100 |
| 6116 | Sparsely vegetated playa (Ephemeral annuals) Mapping Unit | 4 | 100 | 6 | 90 |
| 3725 | Suaeda moquinii Alliance | 5 | 84 | 3 | 80 |
| 1432 | Tamarix spp. Semi-natural Stands | 6 | 86.7 | 7 | 85.7 |
| 3416 | Typha (angustifolia, domingensis, latifolia) Alliance | 1 | 100 | 2 | 70 |
| 6114 | Unvegetated wash and river bottom Mapping Unit | 1 | 60 | 0 | - |
| | **Overall Percent Accuracy** | | **88.3** | | **90.2** |

## Table 14. Accuracy Assessment Scores for the Picacho Subarea

| Map Unit | Map Type | Users' count | Users' Accuracy | Producers' count | Producers' Accuracy |
|---|---|---|---|---|---|
| 3410 | Arid West freshwater emergent marsh Group | 2 | 100 | 4 | 95 |
| 5111 | Atriplex canescens Alliance | 1 | 60 | 0 | - |
| 6111 | Atriplex hymenelytra Alliance | 1 | 80 | 0 | - |
| 3722 | Atriplex lentiformis Alliance | 2 | 100 | 3 | 86.7 |
| 4113 | Atriplex polycarpa Alliance | 4 | 90 | 6 | 80 |
| 7222 | Chilopsis linearis – Psorothamnus spinosus Alliance | 9 | 91.1 | 9 | 95.6 |
| 6117 | Chorizanthe rigida – Geraea canescens Desert Pavement Alliance | 8 | 97.5 | 7 | 100 |
| 4114 | Encelia farinosa Alliance | 3 | 100 | 3 | 100 |
| 4119 | Larrea tridentata Alliance | 10 | 92 | 8 | 87.5 |
| 4115 | Larrea tridentata – Ambrosia dumosa Alliance | 6 | 100 | 9 | 91.1 |
| 4118 | Larrea tridentata – Encelia farinosa Alliance | 4 | 95 | 5 | 96 |
| 6110 | North American warm desert bedrock cliff and outcrop Group | 5 | 100 | 6 | 96.7 |
| 4227 | Parkinsonia florida – Olneya tesota Alliance | 13 | 87.7 | 8 | 100 |
| 1431 | Phragmites australis – Arundo donax Semi-natural Stands | 6 | 100 | 7 | 94.3 |
| 4221 | Pluchea sericea Alliance | 6 | 100 | 7 | 91.4 |
| 1411 | Populus fremontii – Fraxinus velutina – Salix gooddingii Alliance | 0 | - | 4 | 65 |
| 4222 | Prosopis glandulosa – Prosopis velutina – Prosopis pubescens Alliance | 7 | 82.9 | 6 | 90 |
| 1416 | Salix gooddingii – Salix laevigata Alliance | 4 | 90 | 2 | 100 |
| 3412 | Schoenoplectus (acutus, californicus) Alliance | 1 | 60 | 0 | - |
| 3718 | Schoenoplectus americanus Alliance | 1 | 80 | 0 | - |
| 1432 | Tamarix spp. Semi-natural Stands | 8 | 70 | 6 | 86.7 |
| 3416 | Typha (angustifolia, domingensis, latifolia) Alliance | 8 | 100 | 7 | 100 |
| 6114 | Unvegetated wash and river bottom Mapping Unit | 5 | 100 | 7 | 85.7 |
| | **Overall Percent Accuracy** | | **89.8** | | **91.7** |

## Table 15. Accuracy Assessment Scores for the Owens Valley Subarea

| Map Unit | Mapping Unit | Users' count | Users' Accuracy | Producers' count | Producers' Accuracy |
|---|---|---|---|---|---|
| 4111 | Ambrosia dumosa Alliance | 2 | 80 | 4 | 85 |
| 7211 | Ambrosia salsola – Bebbia juncea Alliance | 3 | 93.3 | 4 | 70 |
| 3713 | Anemopsis californica–Helianthus nuttallii–Solidago spectabilis Alliance | 3 | 86.7 | 1 | 100 |
| 3410 | Arid West freshwater emergent marsh Group | 1 | 100 | 2 | 100 |
| 5311 | Artemisia tridentata Alliance | 5 | 56 | 4 | 75 |
| 5111 | Atriplex canescens Alliance | 6 | 63.3 | 5 | 64 |
| 5112 | Atriplex confertifolia Alliance | 4 | 75 | 4 | 85 |
| 6111 | Atriplex hymenelytra Alliance | 4 | 80 | 0 | - |
| 3722 | Atriplex lentiformis Alliance | 2 | 80 | 3 | 86.7 |
| 4113 | Atriplex polycarpa Alliance | 7 | 80 | 7 | 65.7 |
| 1423 | Baccharis emoryi – Baccharis sergiloides Alliance | 1 | 80 | 0 | - |
| 1521 | Betula occidentalis Alliance | 3 | 73.3 | 3 | 60 |
| 3715 | Bolboschoenus maritimus, Schoenoplectus americanus Mapping Unit | 0 | - | 1 | 80 |
| 6117 | Chorizanthe rigida – Geraea canescens Desert Pavement Alliance | 0 | - | 6 | 73.3 |
| 5421 | Coleogyne ramosissima Alliance | 2 | 80 | 3 | 66.7 |
| 1522 | Cornus sericea – Rosa woodsii – Ribes spp. Alliance | 4 | 100 | 4 | 100 |
| 6121 | Dicoria canescens – Abronia villosa – Panicum urvilleanum Alliance | 8 | 85 | 0 | - |
| 3726 | Distichlis spicata Alliance | 7 | 74.3 | 5 | 88 |
| 5419 | Ephedra nevadensis - Lycium andersonii - Grayia spinosa Alliance | 3 | 100 | 4 | 85 |
| 5217 | Ericameria nauseosa – Atriplex lentiformis Mapping Unit | 2 | 90 | 3 | 73.3 |
| 5212 | Ericameria nauseosa Alliance | 3 | 100 | 7 | 65.7 |
| 2221 | Eriogonum fasciculatum – Viguiera parishii Alliance | 6 | 66.7 | 5 | 80 |
| 2226 | Eriogonum fasciculatum Alliance | 1 | 20 | 0 | - |
| 1611 | Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia Alliance | 5 | 100 | 5 | 100 |
| 1425 | Rhus trilobata – Crataegus rivularis – Forestiera pubescens Alliance | 3 | 93.3 | 4 | 90 |
| 3611 | Juncus arcticus (var. balticus, mexicanus) Alliance | 1 | 100 | 5 | 56 |
| 4115 | Larrea tridentata – Ambrosia dumosa Alliance | 4 | 95 | 5 | 92 |
| 4119 | Larrea tridentata Alliance | 5 | 96 | 5 | 96 |
| 6115 | Massive sparsely vegetated rock outcrop Mapping Unit | 1 | 80 | 0 | - |
| 6120 | North American warm desert dunes and sand flats Group | 1 | 100 | 6 | 93.3 |
| 1411 | Populus fremontii – Fraxinus velutina – Salix gooddingii Alliance | 2 | 100 | 5 | 88 |
| 7212 | Prunus fasciculata – Salazaria mexicana Alliance | 1 | 40 | 0 | - |
| 4219 | Psorothamnus fremontii – Psorothamnus polydenius Alliance | 6 | 76.7 | 5 | 88 |
| 1424 | Salix exigua Alliance | 6 | 90 | 4 | 85 |
| 1416 | Salix gooddingii – Salix laevigata Alliance | 3 | 93.3 | 2 | 100 |
| 1427 | Salix lasiolepis Alliance | 5 | 76 | 4 | 95 |
| 5511 | Sarcobatus vermiculatus Alliance | 7 | 80 | 6 | 80 |
| 3412 | Schoenoplectus (acutus, californicus) Alliance | 5 | 88 | 3 | 100 |
| 3712 | Sporobolus airoides – Muhlenbergia asperifolia – Spartina gracilis Alliance | 3 | 86.7 | 2 | 100 |
| 7411 | Suaeda moquinii – Isocoma acradenia Alliance | 6 | 86.7 | 5 | 96 |
| 1432 | Tamarix spp. Semi-natural Stands | 4 | 100 | 5 | 96 |
| 3416 | Typha (angustifolia, domingensis, latifolia) Alliance | 2 | 100 | 2 | 100 |
| 3110 | Vancouverian & Rocky Mountain naturalized grassland Group | 4 | 100 | 4 | 100 |
| 5423 | Yucca brevifolia Alliance | 1 | 80 | 0 | - |
| | **Overall Percent Accuracy** | | **83.9** | | **85.4** |

## Table 16. Accuracy Assessment Scores for the Jawbone South Subarea

| Map Unit | Mapping Unit | Users' count | Users' Accuracy | Producers' count | Producers' Accuracy |
|---|---|---|---|---|---|
| 1111 | Quercus douglasii Alliance | 8 | 92.5 | 7 | 94.3 |
| 1112 | Quercus lobata Alliance | 1 | 100 | 1 | 100 |
| 1113 | Quercus chrysolepis Alliance | 5 | 92 | 4 | 95 |
| 1114 | Quercus wislizeni Alliance | 4 | 95 | 7 | 77.1 |
| 1118 | Quercus kelloggii Alliance | 4 | 100 | 4 | 100 |
| 1121 | Pinus sabiniana Alliance | 2 | 100 | 3 | 86.7 |
| 1122 | Juniperus californica Alliance | 6 | 86.7 | 4 | 100 |
| 1213 | Pinus jeffreyi Alliance | 4 | 100 | 6 | 93.3 |
| 1311 | Pinus monophylla Alliance | 8 | 87.5 | 5 | 100 |
| 1411 | Populus fremontii – Fraxinus velutina – Salix gooddingii Alliance | 4 | 100 | 5 | 96 |
| 1416 | Salix gooddingii – Salix laevigata Alliance | 2 | 60 | 0 | - |
| 1422 | Baccharis salicifolia Alliance | 7 | 94.3 | 5 | 100 |
| 1423 | Baccharis emoryi – Baccharis sergiloides Alliance | 0 | - | 2 | 40 |
| 1425 | Rhus trilobata – Crataegus rivularis – Forestiera pubescens Alliance | 5 | 96 | 4 | 100 |
| 1427 | Salix lasiolepis Alliance | 1 | 100 | 5 | 76 |
| 2111 | Arctostaphylos glauca Alliance | 1 | 80 | 0 | - |
| 2116 | Ceanothus cuneatus Alliance | 3 | 93.3 | 5 | 60 |
| 2117 | Arctostaphylos viscida Alliance | 0 | - | 1 | 80 |
| 2123 | Ceanothus oliganthus – Ceanothus leucodermis Alliance | 0 | - | 1 | 80 |
| 2217 | Corethrogyne filaginifolia – Eriogonum (elongatum, nudum) Alliance | 1 | 80 | 0 | - |
| 2221 | Eriogonum fasciculatum – Viguiera parishii Alliance | 2 | 80 | 3 | 73.3 |
| 2222 | Eriogonum wrightii–Eriogonum heermannii–Buddleja utahensis Alliance | 4 | 100 | 6 | 93.3 |
| 2226 | Eriogonum fasciculatum Alliance | 3 | 73.3 | 1 | 100 |
| 2305 | California annual and perennial grassland (native comp.) Mapping Unit | 0 | - | 3 | 80 |
| 2330 | Mediterranean California naturalized annual & perennial grassland Group | 1 | 80 | 0 | - |
| 2331 | Brassica tournefortii – Malcolmia arabicus Semi-natural Stands | 1 | 80 | 0 | - |
| 3312 | Quercus john-tuckeri Alliance | 0 | - | 3 | 60 |
| 3316 | Ceanothus greggii – Fremontodendron californicum Alliance | 5 | 68 | 2 | 100 |
| 4111 | Ambrosia dumosa Alliance | 4 | 55 | 3 | 60 |
| 4113 | Atriplex polycarpa Alliance | 4 | 80 | 6 | 76.7 |
| 4115 | Larrea tridentata – Ambrosia dumosa Alliance | 8 | 97.5 | 8 | 97.5 |
| 4119 | Larrea tridentata Alliance | 1 | 80 | 0 | - |
| 4212 | Lepidospartum squamatum Alliance | 9 | 91.1 | 8 | 97.5 |
| 5211 | Encelia (actoni, virginensis) – Viguiera reticulata Alliance | 2 | 40 | 0 | - |
| 5212 | Ericameria nauseosa Alliance | 7 | 94.3 | 7 | 85.7 |
| 5311 | Artemisia tridentata Alliance | 4 | 90 | 5 | 80 |
| 5419 | Ephedra nevadensis - Lycium andersonii - Grayia spinosa Alliance | 0 | - | 5 | 44 |
| 5421 | Coleogyne ramosissima Alliance | 6 | 76.7 | 3 | 73.3 |
| 5423 | Yucca brevifolia Alliance | 1 | 100 | 2 | 90 |
| 5441 | Cercocarpus ledifolius Alliance | 1 | 20 | 0 | - |
| 6110 | North American warm desert bedrock cliff and outcrop Group | 0 | - | 2 | 100 |
| 6115 | Massive sparsely vegetated rock outcrop Mapping Unit | 3 | 66.7 | 0 | - |
| 7211 | Ambrosia salsola – Bebbia juncea Alliance | 5 | 84 | 7 | 74.3 |
| 7212 | Prunus fasciculata – Salazaria mexicana Alliance | 9 | 55.6 | 4 | 85 |
| 9320 | Anthropogenic Areas of Little or No Vegetation Mapping Unit | 1 | 80 | 0 | - |
| | **Overall Percent Accuracy** | | **82.9** | | **84.3** |

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# GLOSSARY

| | |
|---|---|
| **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. |

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|---|---|
| **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). |

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|---|---|
| **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). |
| **Sclerophyllous** | 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**". |

Note: Refer to Appendix G and I for further vegetation terminology.

# List of Acronyms

| | |
|---|---|
| **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, photointerpreter |
| **ROW** | Right-of-way |
| **USGS** | US Geological Survey |
| **VegCAMP** | Vegetation Classification and Mapping Program |

# APPENDIX A-1
## DRECP MAPPING CLASSIFICATION – Hierarchy
## 12/14/2020

## Vegetation Type (Map Unit)

**NOTE:**
^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) Alliance*
*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 (3000)**

**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= Elymus multisetus (Big squirreltail patches) Provisional Alliance <Not in key, Never mapped>*

*3122 = Aristida purpurea – Elymus elymoides – Poa secunda (Purple three-awn – Squirreltail – Curly blue grass grassland) Alliance [name change] <Never mapped>*

**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 [formerly 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)*

*%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*

**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>

**$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
- 9501 = Eucalyptus <Never mapped>

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

## 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 visible
1 = Low
2 = Moderate
3 = High
9 = Not applicable/Not assigned

## Roadedness Disturbance

0 = None visible
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 visible
1 = Low (>0 - 2% of polygon affected)
2 = Moderate (>2% - 5% of polygon affected)
3 = High (>5% of polygon affected)
9 = Not applicable/Not evaluated

## Anthropogenically Altered Disturbance

0 = None visible
1 = Low (>0% – 33% of polygon affected)
2 = Moderate (>33% – 66% of polygon affected)
3 = High (>66% of polygon affected)
9 = Not applicable/Not evaluated

## Altered Hydrologic Regime Modifier

0 = Not affected
1 = Affected
9 = Not applicable/Not assigned

## 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
3 - Field Verification
4 - Photo Interpretation
5 - Adjacent stand information or photo
6 - Reconnaissance (current project)
7 - Other information
8 - Older plot data
9 - Older recon data
10 - Accuracy Assessment

## 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

## Alphabetical List of Alliances in Vegetation Databases by Lifeform

## Trees

*Abies concolor* Alliance (1212)
*Aesculus californica* Alliance (1116)
*Alnus rhombifolia* Alliance (1511)
*Chilopsis linearis – Psorothamnus spinosus* Alliance (7222)
    *Chilopsis linearis* Association (formerly Alliance) (4224) – Salton Sea North
    *Psorothamnus spinosus* Association (formerly Alliance) (4225) – Salton Sea North and South
*Eucalyptus* spp. – *Ailanthus altissima – Robinia pseudoacacia* Semi-natural Alliance (1611)
*Juniperus californica* Alliance (1122)
*Parkinsonia florida – Olneya tesota* Alliance (4227)
*Pinus jeffreyi* Alliance (1213)
*Pinus monophylla* Alliance (1311)
*Pinus sabiniana* Alliance (1121)
*Platanus racemosa* Alliance (1414)
*Populus fremontii – Fraxinus velutina – Salix gooddingii* Alliance (1411)
*Populus trichocarpa* Alliance (1512)
*Prosopis glandulosa – Prosopis velutina – Prosopis pubescens* Alliance (4222)
*Psorothamnus spinosus* Association (formerly Alliance) – See *Chilopsis linearis – Psorothamnus spinosus* Alliance
*Quercus chrysolepis* Alliance (1113)
*Quercus douglasii* Alliance (1111)
*Quercus kelloggii* Alliance (1118)
*Quercus lobata* Alliance (1112)
*Quercus wislizeni* Alliance (1114)
*Salix gooddingii –Salix laevigata* Alliance (1416)
Southwestern North American riparian evergreen and deciduous woodland Group (1410)
*Yucca brevifolia* Alliance (5423)

## Shrubs

*Acacia greggii – Hyptis emoryi – Justicia californica* Alliance (4226)
*Allenrolfea occidentalis* Alliance (3721)
*Ambrosia dumosa* Alliance (4111)
*Ambrosia salsola – Bebbia juncea* Alliance (7211)
    *Ambrosia salsola* Mapping Unit (formerly Alliance) (4216) – Salton Sea North and South
*Arctostaphylos glauca* Alliance (2111)
*Arctostaphylos viscida* Alliance (2117)
*Artemisia tridentata* Alliance (5311)
*Atriplex canescens* Alliance (5111)
*Atriplex confertifolia* Alliance (5112)
*Atriplex lentiformis* Alliance (3722)
*Atriplex polycarpa* Alliance (4113)
*Baccharis emoryi – Baccharis sergiloides* Alliance (1423)
*Baccharis salicifolia* Alliance (1422)
*Betula occidentalis* Alliance (1521)
*Castela emoryi* Special Stands – See *Ephedra californica – Ephedra trifurca* Alliance
*Ceanothus cordulatus – Ceanothus integerrimus* Alliance (3212)
*Ceanothus cuneatus* Alliance (2116)
*Ceanothus greggii – Fremontodendron californicum* Alliance (3316)
*Ceanothus oliganthus – Ceanothus leucodermis* Alliance (2123)
Central and south coastal California seral shrub Group (2210)
*Cercocarpus ledifolius* Alliance (5441)
*Cercocarpus montanus* Alliance (2131)
*Coleogyne ramosissima* Alliance (5421)
*Cornus sericea – Rosa woodsii – Ribes* spp. Alliance (1522)
*Cylindropuntia bigelovii* Alliance (4124)
*Encelia (actoni, virginensis) – Viguiera reticulata)* Alliance (5211)
*Encelia farinosa* Alliance (4114)
*Ephedra californica – Ephedra trifurca* Alliance (4211)
    *Castela emoryi* Special Stands (formerly Alliance) (4229) – Salton Sea South
*Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419)
*Ephedra viridis* Alliance (5417)
*Ericameria linearifolia – Cleome isomeris* Alliance (2214)
*Ericameria nauseosa* Alliance (5212)
*Ericameria nauseosa – Atriplex lentiformis* Mapping Unit (5217)
*Ericameria paniculatum* Alliance (4213)

*Ericameria teretifolia* Alliance (5416)
*Eriogonum fasciculatum* Alliance (cismontane) (2226)
*Eriogonum fasciculatum – Viguiera parishii* Alliance (2221)
*Eriogonum wrightii – Eriogonum heermannii – Buddleja utahensis* Alliance (2222)
*Rhus trilobata – Crataegus rivularis – Forestiera pubescens* Alliance (1425)
*Frangula californica* Alliance (3811)
*Isocoma acradenia* Association (formerly Alliance) – See *Suaeda moquinii – Isocoma acradenia* Alliance
*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)
*Parkinsonia microphylla* Provisional Alliance (4152)
*Pluchea sericea* Alliance (4221)
*Prunus fasciculata – Salazaria mexicana* Alliance (7212)
*Psorothamnus fremontii – Psorothamnus polydenius* Alliance (4219)
*Purshia tridentata – Artemisia tridentata* Alliance (5422)
*Quercus john-tuckeri (3312)*
*Quercus palmeri* Alliance (3313)
*Ribes quercetorum* Provisional Alliance (3211)
*Salix exigua* Alliance (1424)
*Salix lasiolepis* Alliance (1427)
*Sarcobatus vermiculatus* Alliance (5511)
Southwestern North American riparian/wash scrub Group (1420)
*Suaeda moquinii – Isocoma acradenia* Alliance (7411)
*Isocoma acradenia* Association (formerly Alliance) (3728) – Salton Sea North, Salton Sea South, Flat-Tailed Horned Lizard
*Suaeda moquinii* Mapping Unit (formerly Alliance) (3725) – Picacho, Salton Sea North, Salton Sea South
*Tamarix* spp. Semi-natural Stands (1432)
*Vitus arizonica – Vitus girdiana* Alliance (1428)

## Herbaceous

*Achnatherum speciosum* Alliance (5431)
*Anemopsis californica – Helianthus nuttallii – Solidago spectabilis* Alliance (3713)
Arid West freshwater emergent marsh Group (3410)
*Arundo donax* Semi-natural Stands – See *Phragmites australis – Arundo donax* Semi-Natural Stands
*Bolboschoenus maritimus, Schoenoplectus americanus* Mapping Unit (3715)
*Brassica tournefortii – Malcolmia africana* Semi-natural Stands (2331)
California annual and perennial grassland Mapping Unit (Native component) (2305)
California annual forb/grass vegetation Group (2310)
California mixed annual/perennial freshwater vernal pool/swale/plain bottomland Group (3510)
Californian warm temperate marsh/seep Group (3610)
*Corethrogyne filaginifolia – Eriogonum (elongatum, nudum)* Alliance (2217)
*Distichlis spicata* Alliance (3726)
*Juncus arcticus* (var. *balticus, mexicanus*) Alliance (3611)
Mediterranean California naturalized annual and perennial grassland Group (2330)
*Phragmites australis – Arundo donax* Semi-natural Stands (1431)
*Phragmites australis* ssp. *americanus* Association (formerly Alliance) – See *Typha (angustifolia, domingensis, latifolia)* Alliance
*Pleuraphis rigida* Alliance (4122)
*Schoenoplectus (acutus, californicus)* Alliance (3412)
Southern Great Basin semi-desert grass Group (5430)
Southwestern North American alkali marsh/seep vegetation Group (3710)
*Sporobolus airoides – Muhlenbergia asperifolia – Spartina gracilis* Alliance (3712)
*Typha (angustifolia, domingensis, latifolia)* Alliance (3416)
*Phragmites australis* ssp. *americanus* Association (formerly Alliance) (3411) – Salton Sea South subarea
*Typha (angustifolia, domingensis, latifolia)* Mapping Unit (formerly Alliance) (3415) – Salton Sea North
Vancouverian & Rocky Mountain naturalized annual grassland Group (3110)
Warm Semi-Desert/Mediterranean Alkali-Saline Wetland Macrogroup (3700)
Western North American Freshwater Marsh Macrogroup (3400)
Western North American Wet Meadow & Low Shrub Carr Macrogroup (3600)

## Sparse Types

*Atriplex hymenelytra* Alliance (6111)
*Chorizanthe rigida – Geraea canescens* Desert Pavement Sparsely Vegetated Alliance (6117)
*Dicoria canescens – Abronia villosa - Panicum urvilleanum* Alliance (6121)
Massive sparsely vegetated rock outcrop Mapping Unit (6115)
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)
Sparsely vegetated playa (Ephemeral annuals) Mapping Unit (6116)
Unvegetated wash and river bottom Mapping Unit (6114)

## Miscellaneous Classes

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

Built-up & Urban Disturbance (9300)
- Anthropogenic areas of little or no vegetation (9320)

Restoration (9400)

Exotic Trees (9500)

Sparsely vegetated recent burned areas (9701)

Water (9800)
- Perennial Stream Channel (Open Water) (9801)
- Small Earthen-dammed Ponds and Naturally Occurring Lakes (9803)
- Major Canals and Aqueducts (9804)
- Water Impoundment Feature (9805)

## 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 visible
1 = Low
2 = Moderate
3 = High
9 = Not applicable/Not assigned

## Roadedness Disturbance

0 = None visible
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 visible
1 = Low (>0 - 2% of polygon affected)
2 = Moderate (>2% - 5% of polygon affected)
3 = High (>5% of polygon affected)
9 = Not applicable/Not evaluated

## Anthropogenically Altered Disturbance

0 = None visible
1 = Low (>0% – 33% of polygon affected)
2 = Moderate (>33% – 66% of polygon affected)
3 = High (>66% of polygon affected)
9 = Not applicable/Not evaluated

## Altered Hydrologic Regime Modifier

0 = Not affected
1 = Affected
9 = Not applicable/Not assigned

## 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
3 - Field Verification
4 - Photo Interpretation
5 - Adjacent stand information or photo
6 - Reconnaissance (current project)
7 - Other information
8 - Older plot data
9 - Older recon data
10 - Accuracy Assessment

## 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

1111 = *Quercus douglasii* Alliance
1112 = *Quercus lobata* Alliance
1113 = *Quercus chrysolepis* Alliance
1114 = *Quercus wislizeni* Alliance
1116 = *Aesculus californica* Alliance
1118 = *Quercus kelloggii* Alliance
1121 = *Pinus sabiniana* Alliance
1122 = *Juniperus californica* Alliance
1212 = *Abies concolor* Alliance
1213 = *Pinus jeffreyi* Alliance
1311 = *Pinus monophylla* Alliance
1410 = Southwestern North American riparian evergreen deciduous woodland Group
1411 = *Populus fremontii – Fraxinus velutina – Salix gooddingii* Alliance
1414 = *Platanus racemosa* Alliance
1416 = *Salix gooddingii –Salix laevigata* Alliance
1511 = *Alnus rhombifolia* Alliance
1523 = *Populus trichocarpa* Alliance
1611 = *Eucalyptus* spp. – *Ailanthus altissima – Robinia pseudoacacia* Semi-natural Alliance
4222 = *Prosopis glandulosa – Prosopis velutina – Prosopis pubescens* Alliance
4227 = *Parkinsonia florida – Olneya tesota* Alliance
4224 = *Chilopsis linearis Association* (formerly Alliance) - See *Chilopsis linearis – Psorothamnus spinosus* Alliance (7222)
4225 = *Psorothamnus spinosus* Association (formerly Alliance) – See *Chilopsis linearis – Psorothamnus spinosus* Alliance (7222)
5423 = *Yucca brevifolia* Alliance
7222 = *Chilopsis linearis – Psorothamnus spinosus* Alliance
*Chilopsis linearis* Association (formerly Alliance) (4224) – Salton Sea North
*Psorothamnus spinosus* Association (formerly Alliance) (4225) – Salton Sea North and South

## Shrubs

1420 = Southwestern North American riparian/wash scrub Group
1422 = *Baccharis salicifolia* Alliance
1423 = *Baccharis emoryi – Baccharis sergiloides* Alliance
1424 = *Salix exigua* Alliance
1425 =*Rhus trilobata – Crataegus rivularis – Forestiera pubescens* Alliance
1427 = *Salix lasiolepis* Alliance
1432 = *Tamarix* spp. Semi-natural Stands
1521 = *Betula occidentalis* Alliance
1522 = *Cornus sericea – Rosa woodsii – Ribes* spp. Alliance
2111 = *Arctostaphylos glauca* Alliance
2116 = *Ceanothus cuneatus* Alliance
2117 = *Arctostaphylos viscida* Alliance
2123 = *Ceanothus oliganthus – Ceanothus leucodermis* Alliance
2131 = *Cercocarpus montanus* Alliance
2210 = Central and south coastal California seral shrub Group
2214 = *Ericameria linearifolia – Cleome isomeris* Alliance
2221 = *Eriogonum fasciculatum – Viguiera parishii* Alliance
2222 = *Eriogonum wrightii – Eriogonum heermannii – Buddleja utahensis* Alliance
2226 = *Eriogonum fasciculatum* Alliance (cismontane)
3211 = *Ribes quercetorum* Provisional Alliance
3212 = *Ceanothus cordulatus – Ceanothus integerrimus* Alliance
3312 = *Quercus john-tuckeri* Alliance
3313 = *Quercus palmeri* Alliance
3316 = *Ceanothus greggii – Fremontodendron californicum* Alliance
3721 = *Allenrolfea occidentalis* Alliance
3722 = *Atriplex lentiformis* Alliance
3725 = *Suaeda moquinii* Mapping Unit (formerly Alliance) – See *Suaeda moquinii – Isocoma acradenia* Alliance (7411)
3728 = *Isocoma acradenia* Association (formerly Alliance) – See *Suaeda moquinii – Isocoma acradenia* Alliance (7411)
3811 = *Frangula californica* Alliance
4110 = Lower bajada and fan Mojavean-Sonoran desert scrub Group
4111 = *Ambrosia dumosa* Alliance
4113 = *Atriplex polycarpa* Alliance
4114 = *Encelia farinosa* Alliance (4114)
4115 = *Larrea tridentata – Ambrosia dumosa* Alliance

4118 = *Larrea tridentata – Encelia farinosa* Alliance

4119 = *Larrea tridentata* Alliance

4124 = *Cylindropuntia bigelovii* Alliance

4152 = *Parkinsonia microphylla* Provisional Alliance

4211 = *Ephedra californica – Ephedra trifurca* Alliance

*Castela emoryi* Special Stands (formerly Alliance) (4229) – Salton Sea South

4212 = *Lepidospartum squamatum* Alliance

4213 = *Ericameria paniculatum* Alliance

4216 = *Ambrosia salsola* Mapping Unit (formerly Alliance) – See *Ambrosia salsola – Bebbia juncea* Alliance

4219 = *Psorothamnus fremontii – Psorothamnus polydenius* Alliance

4221 = *Pluchea sericea* Alliance

4226 = *Acacia greggii – Hyptis emoryi – Justicia californica* Alliance

4229 = *Castela emoryi* Special Stands – See *Ephedra californica – Ephedra trifurca* Alliance (4211)

5111 = *Atriplex canescens* Alliance

5112 = *Atriplex confertifolia* Alliance

5211 = *Encelia (actoni, virginensis) – Viguiera reticulata)* Alliance

5212 = *Ericameria nauseosa* Alliance

5217 = *Ericameria nauseosa – Atriplex lentiformis* Mapping Unit

5311 = *Artemisia tridentata* Alliance

5416 = *Ericameria teretifolia* Alliance

5417 = *Ephedra viridis* Alliance

5419 = *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance

5421 = *Coleogyne ramosissima* Alliance

5441 = *Cercocarpus ledifolius* Alliance

5422 = *Purshia tridentata – Artemisia tridentata* Alliance

5511 = *Sarcobatus vermiculatus* Alliance

7211 = *Ambrosia salsola – Bebbia juncea* Alliance

*Ambrosia salsola* Mapping Unit (formerly Alliance) (4216) – Salton Sea North and South

7212 = *Prunus fasciculata – Salazaria mexicana* Alliance

7411 = *Suaeda moquinii – Isocoma acradenia* Alliance

*Isocoma acradenia* Association (formerly Alliance) (3728) – Salton Sea North, Salton Sea South, Flat-Tailed Horned Lizard

*Suaeda moquinii* Mapping Unit (formerly Alliance) (3725) – Picacho, Salton Sea North, Salton Sea South

## Herbaceous

1431 = *Phragmites australis – Arundo donax* Semi-natural Stands

1431 = *Arundo donax* Semi-natural Stands – See *Phragmites australis – Arundo donax* Semi-Natural Stands (1431)

2217 = *Corethrogyne filaginifolia – Eriogonum (elongatum, nudum)* Alliance

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

2310 = California annual forb/grass vegetation Group

2330 = Mediterranean California naturalized annual and perennial grassland Group

2331 = *Brassica tournefortii – Malcolmia africana* Semi-natural Stands

3110 = Vancouverian & Rocky Mountain naturalized annual grassland Group

3400 = Western North American Freshwater Marsh Macrogroup

3410 = Arid West freshwater emergent marsh Group

3411 = *Phragmites australis* ssp. *americanus* Association (formerly Alliance) – See *Typha (angustifolia, domingensis, latifolia)* Alliance (3416)

3412 = *Schoenoplectus (acutus, californicus)* Alliance

3415= *Typha (angustifolia, domingensis, latifolia)* Mapping Unit (formerly Alliance) – See *Typha (angustifolia, domingensis, latifolia)* Alliance (3416)

3416 = *Typha (angustifolia, domingensis, latifolia)* Alliance

*Phragmites australis* ssp. *americanus* Association (formerly Alliance) (3411) – Salton Sea South subarea

*Typha (angustifolia, domingensis, latifolia)* Mapping Unit (formerly Alliance) (3415)

3510 = California mixed annual/perennial freshwater vernal pool/swale/plain bottomland Group

3600 = Western North American Wet Meadow & Low Shrub Carr Macrogroup

3610 = Californian warm temperate marsh/seep Group

3611 = *Juncus arcticus* (var. *balticus, mexicanus*) Alliance

3700 = Warm Semi-Desert/Mediterranean Alkali-Saline Wetland Macrogroup

3710 = Southwestern North American alkali marsh/seep vegetation Group

3712 = *Sporobolus airoides – Muhlenbergia asperifolia – Spartina gracilis* Alliance

3713 = *Anemopsis californica – Helianthus nuttallii – Solidago spectabilis* Alliance

3715 = *Bolboschoenus maritimus, Schoenoplectus americanus* Mapping Unit

3726 = *Distichlis spicata* Alliance

4122 = *Pleuraphis rigida* Alliance

5430 = Southern Great Basin semi-desert grass Group

5431 = *Achnatherum speciosum* 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
6115 = Massive sparsely vegetated rock outcrop Mapping Unit
6116 = Sparsely vegetated playa (Ephemeral annuals) Mapping Unit
6117 = *Chorizanthe rigida – Geraea canescens* Desert Pavement Sparsely Vegetated Alliance
6120 = North American warm desert dunes and sand flats Group
6121 = *Dicoria canescens – Abronia villosa - Panicum urvilleanum* Alliance

## Miscellaneous Classes

9200 = Agriculture

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

9300 = Built-up & Urban Disturbance

- Anthropogenic areas of little or no vegetation

9400 = Restoration

9500 = Exotic Trees

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

## 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 visible
1 = Low
2 = Moderate
3 = High
9 = Not applicable/Not assigned

## Roadedness Disturbance

0 = None visible
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 visible
1 = Low (>0 - 2% of polygon affected)
2 = Moderate (>2% - 5% of polygon affected)
3 = High (>5% of polygon affected)
9 = Not applicable/Not evaluated

## Anthropogenically Altered Disturbance

0 = None visible
1 = Low (>0% – 33% of polygon affected)
2 = Moderate (>33% – 66% of polygon affected)
3 = High (>66% of polygon affected)
9 = Not applicable/Not evaluated

## Altered Hydrologic Regime Modifier

0 = Not affected
1 = Affected
9 = Not applicable/Not assigned

## 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
3 - Field Verification
4 - Photo Interpretation
5 - Adjacent stand information or photo
6 - Reconnaissance (current project)
7 - Other information
8 - Older plot data
9 - Older recon data
10 - Accuracy Assessment

## 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

## 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 additional mapping of lands within the DRECP region. Please refer to Chapter 3 of Menke et al. (2013) and Menke et al. (2016) 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 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 in the current mapping effort, however, also shown are Jawbone North, Salton Sea North, and Flat-Tailed Horned Lizard subareas, which were mapped under a separate contract, but delivered joined to the current project areas.

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, as well as the Jawbone North, Salton Sea North, and Flat-Tailed Horned Lizard subareas, which were mapped under a separate contract, but delivered joined to the current project areas.

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.

Some vegetation types have a very limited presence in the study area at sizes above MMU. For these types it was not possible to formulate the standard in-depth descriptions. Instead, they are represented only with a distribution map (with enhanced polygons) and a brief discussion.

Note 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 South and Owens Valley 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.

## Trees

*Abies concolor* Alliance (1212)
*Aesculus californica* Alliance (1116)
*Alnus rhombifolia* Alliance (1511)
*Chilopsis linearis – Psorothamnus spinosus* Alliance (7222)
    *Chilopsis linearis* Association (formerly Alliance) (4224) – Salton Sea North
    *Psorothamnus spinosus* Association (formerly Alliance) (4225) – Salton Sea North and South
*Eucalyptus* spp. – *Ailanthus altissima – Robinia pseudoacacia* Semi-natural Alliance (1611)
*Juniperus californica* Alliance (1122)
*Parkinsonia florida – Olneya tesota* Alliance (4227)
*Pinus jeffreyi* Alliance (1213)
*Pinus monophylla* Alliance (1311)
*Pinus sabiniana* Alliance (1121)
*Platanus racemosa* Alliance (1414)
*Populus fremontii – Fraxinus velutina – Salix gooddingii* Alliance (1411)
*Populus trichocarpa* Alliance (1512)
*Prosopis glandulosa – Prosopis velutina – Prosopis pubescens* Alliance (4222)
*Psorothamnus spinosus* Association (formerly Alliance) – See *Chilopsis linearis – Psorothamnus spinosus* Alliance
*Quercus chrysolepis* Alliance (1113)
*Quercus douglasii* Alliance (1111)
*Quercus kelloggii* Alliance (1118)
*Quercus lobata* Alliance (1112)
*Quercus wislizeni* Alliance (1114)
*Salix gooddingii –Salix laevigata* Alliance (1416)
Southwestern North American riparian evergreen and deciduous woodland Group (1410)
*Yucca brevifolia* Alliance (5423)

## Abies concolor Alliance (1212)

White fir forest Alliance

In this screen shot, *Abies concolor* occurs in a dense cover stand with a minor component of *Quercus chrysolepis*. Dead conifer snags appear light brown in color compared to the gray green seen in healthy individuals.

*Abies concolor* locally dominates and mixes in the overstory with *Quercus kelloggii* and *Quercus chrysolepis.*

***Abies concolor* Alliance (1212)**

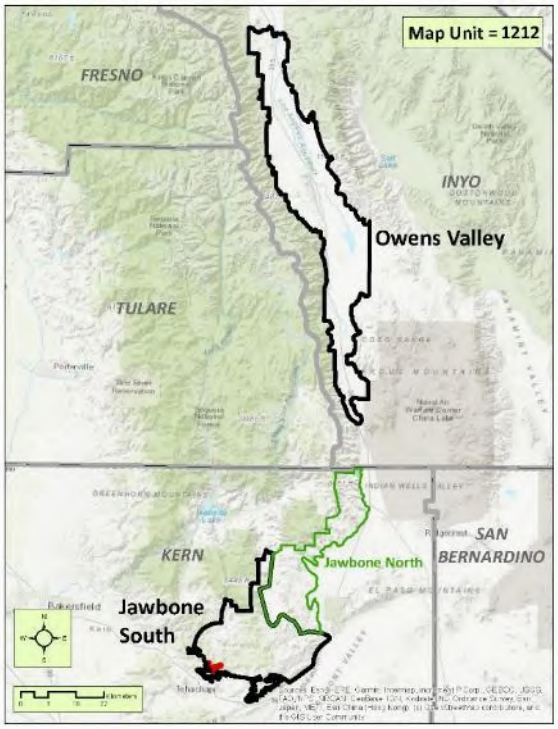
**DESCRIPTION:** Stands characterized by *Abies concolor* and are evenly distributed in canopy, usually with *Quercus chrysolepis* and/or *Q. kelloggii* co-dominant, which may be up to 3 times the cover (*e.g., Q. chrysolepis* 30%, while *Pseudotsuga macrocarpa* or *P. jeffreyi* 10%). *Abies concolor* stands (California race) restricted to highest elevation ridges of the study area (e.g., ridgeline above the Lehigh quarry) in the southern Sierra Nevada typically with *Quercus kelloggii.*

**PHOTOINTERPRETATION SIGNATURE:** *Abies concolor* individuals appear as tall narrow blue-gray to gray-green crowns that crest to a point. This Alliance is restricted to the highest elevations of the study and are commonly mixed with the broader, greener crowns of *Quercus chrysolepis* and *Quercus kelloggii*. In many stands, light brown snags are apparent in portions of the canopy where the conifers have died.

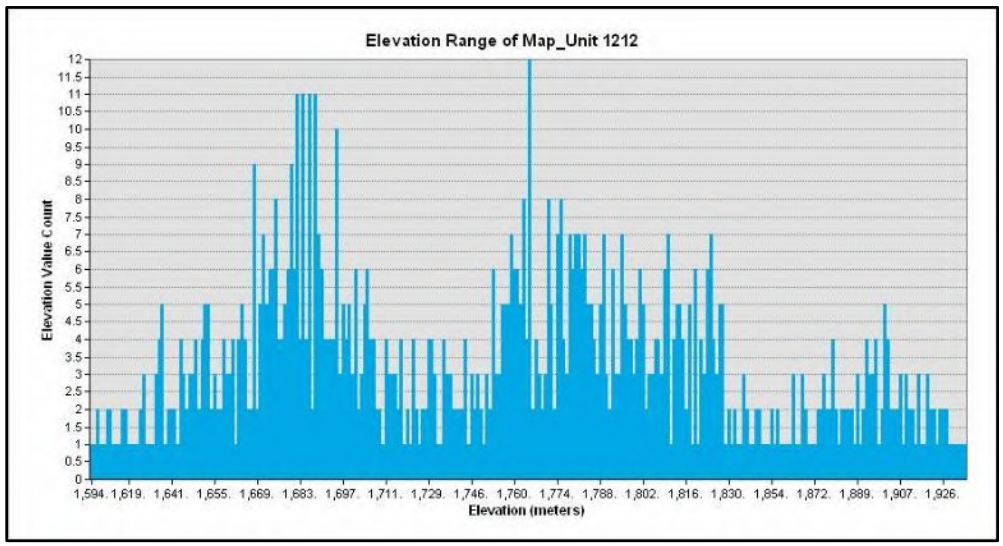
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Pinus jeffreyi* Alliance (1213) – This species also occurs at the highest elevations of the study area and has a similar blue-green to gray-green color. Mature *P. jeffreyi* individuals may be distinguished from *Abies concolor* on the imagery by a slightly broader, more irregularly shaped crown. However, younger individuals of both species are very difficult to differentiate and ground observations are needed to distinguish them from one another.

***Abies concolor* Alliance (1212)**

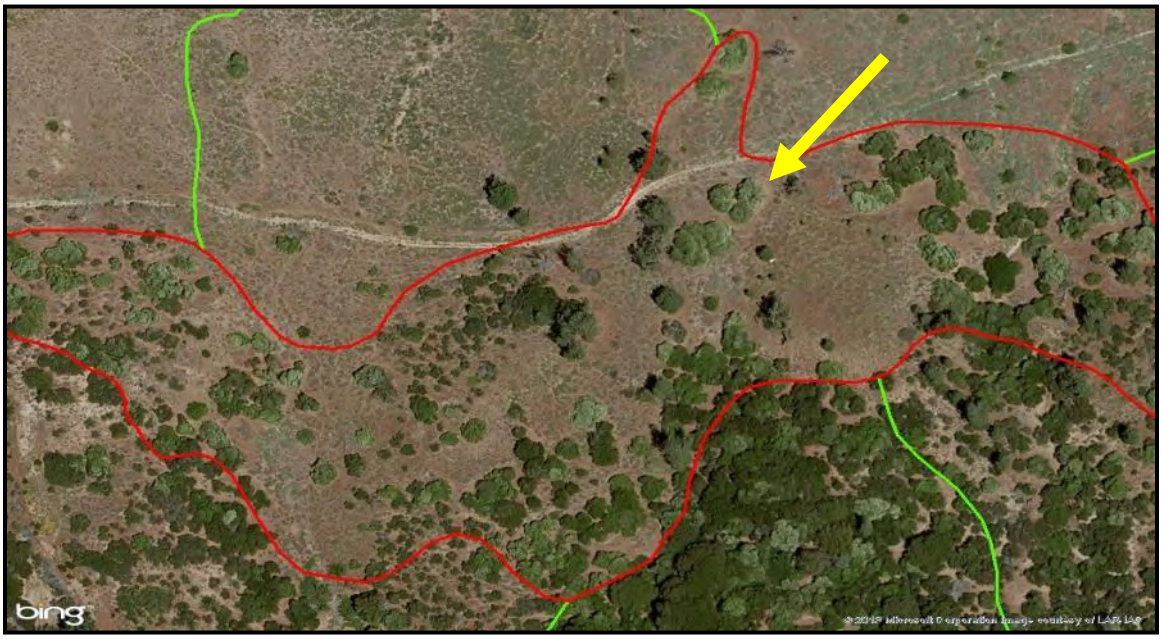



**DISTRIBUTION:** The *Abies concolor* Alliance is found at the western edge of the DRECP area. In the current study area, it is mapped in the southern Piute Mountain foothills of the interior southern Sierra Nevada just west of Sugarloaf Mountain, of the Jawbone South subarea.



## *Aesculus californica* Alliance (1116)

California buckeye groves Alliance



This example depicts gray-green *Aesculus californica* dominating the stand with scattered *Pinus sabiniana* in an open setting with a rather dense understory cover of *Eriogonum fasciculatum.*

The above photo shows a small patch of *Aesculus californica* in an open grassy setting.

***Aesculus californica* Alliance (1116)**

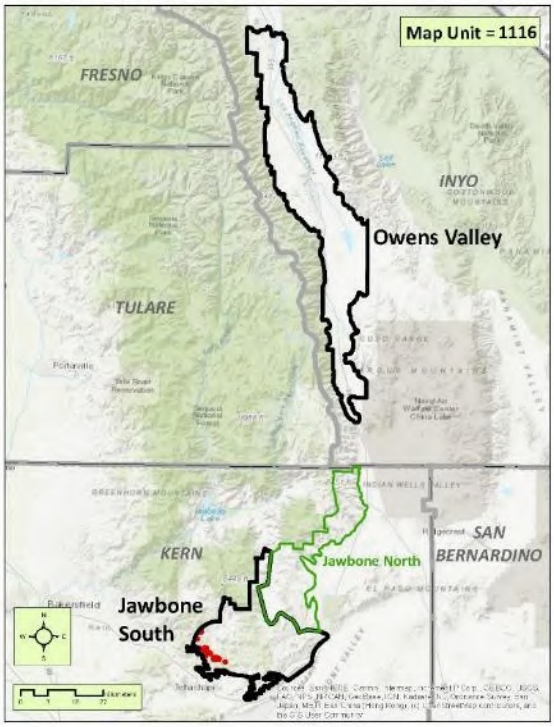
**DESCRIPTION:** In this Alliance *Aesculus californica* is strongly dominant (more than 60 percent relative cover) as a tree or tall shrub in the overstory. If *Aesculus* is co-dominant with an oak species, the Alliance is generally mapped to the oak type. Several polygons mapped as other Alliances have *Aesculus* co-dominating the stand on north-facing or concave slopes north of Liebre Mountain, adjacent to stands of chaparral or *Quercus wislizeni*. *Aesculus californica* Alliance is found in the extreme western portion of the DRECP in the Liebre Mountains and the southern Sierra Nevada.

**PHOTOINTERPRETATION SIGNATURE:** Stands are easily recognizable due to early leaf loss in the late spring and early summer months as a result of the early onset of the dry season. With leaf-on imagery *A. californica* appears bright green to yellow-green. As the leaves senesce the color lightens to light green or yellow-green, then turns to light yellowish-brown to brown. Leaf-off imagery exposes light-colored branches. *Aesculus californica* is generally found as a co-dominant, usually with *Quercus chrysolepis*, or *Quercus wislizeni* in which case it is mapped to those Alliance.

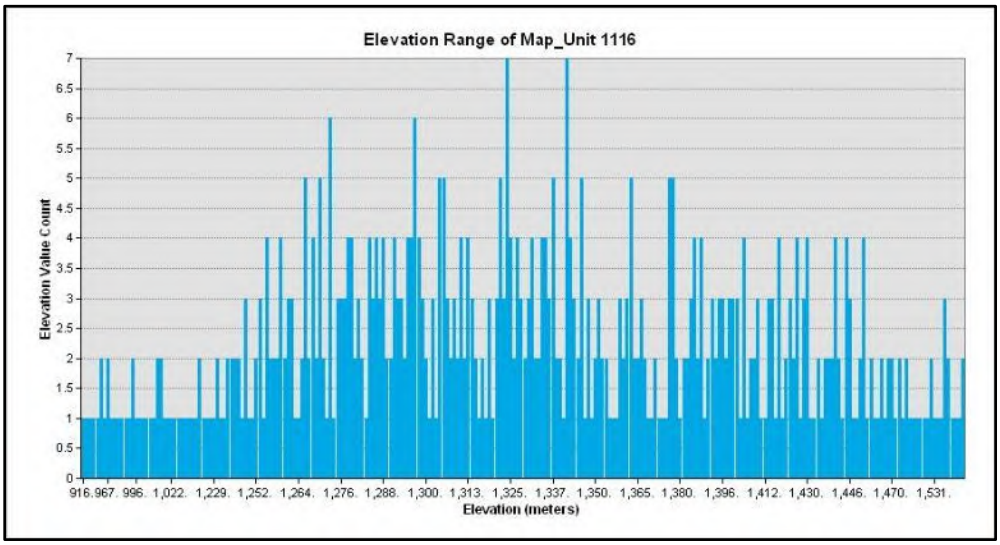
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Quercus chrysolepis* Alliance (1113) – This species is easily distinguishable as a large evergreen oak co-dominating the stand with the summer leaf-off *Aesculus californica.* In settings where the two co-dominate, the stand is classified to the *Quercus chrysolepis* Alliance.
- *Quercus wislizeni* Alliance (1114) – This species is easily distinguishable as a large evergreen oak co-dominating the stand with the summer leaf-off *Aesculus californica.* In settings where the two co-dominate, the stand is classified to the *Quercus wislizeni* Alliance.

***Aesculus californica* Alliance (1116)**




**DISTRIBUTION:** *Aesculus californica* is found at the western edge of the DRECP area. In the current study area, *Aesculus californica* is mapped in the interior southern Sierra Nevada of the Jawbone South subarea.



## *Alnus rhombifolia* Forest Alliance (1511)

White alder groves Forest Alliance

The bright green linear stand of *Alnus rhombifolia* in this image occurs along the margins of this active perennially flowing stream channel.

This photo depicts a small perennial channel with a dense canopy dominated by *Alnus rhombifolia.*

***Alnus rhombifolia* Forest Alliance (1511)**

**DESCRIPTION:** In this Alliance, *Alnus rhombifolia* is present and evenly distributed in the riparian tree layer. Stands of *A. rhombifolia* are found only in the non-desert margins of the study area along perennial steam channels. Where *Platanus racemosa* is consistently present at greater than 1% absolute cover then the stand is mapped to the *Platanus racemosa* Alliance.

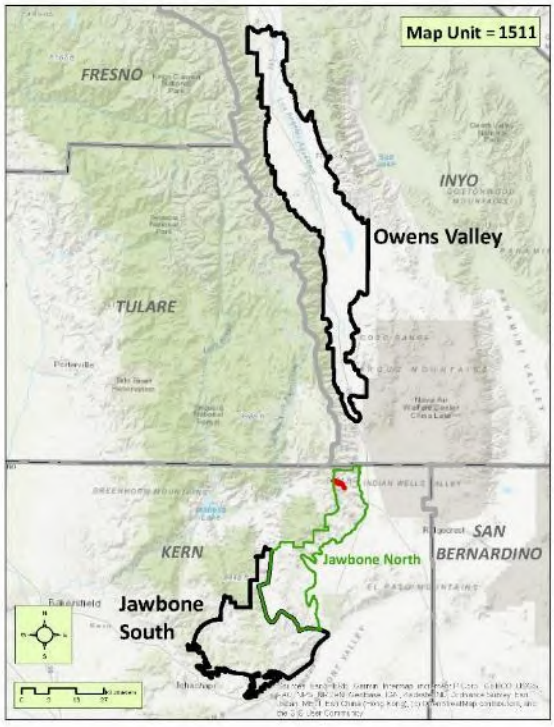
Note: There is a criteria change from previous DRECP mapping where *Alnus* is defined as strongly dominant and evenly distributed in the tree layer (Menke et al., 2013).

**PHOTOINTERPRETATION SIGNATURE:** Stands are narrow, and cover is uniformly high. Individual crowns more or less tend to occur in a neat row of evenly spaced trees. Crown shapes are variable and their color is usually a fairly bright green.

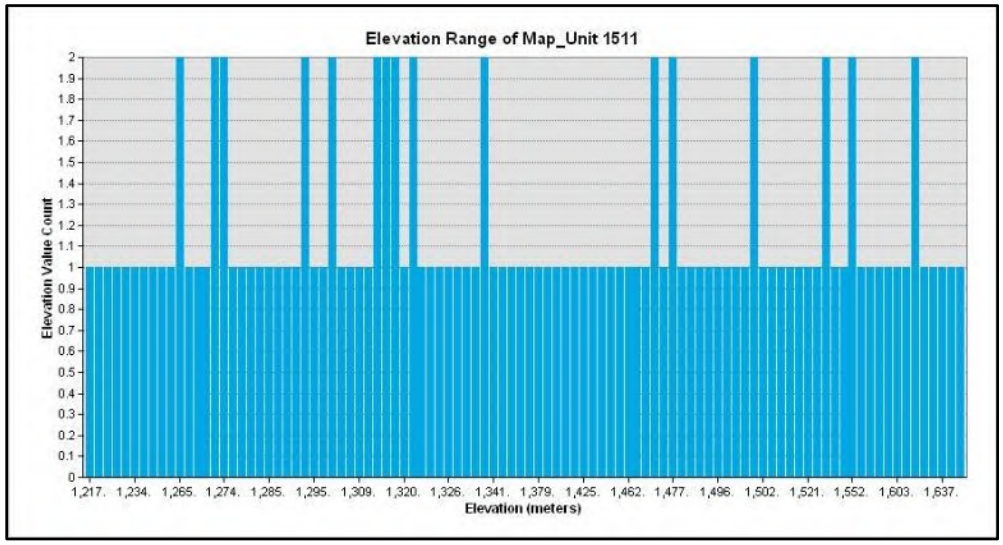
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Platanus racemosa* Alliance (1414) – Stands containing *Platanus racemosa* have more open crowns with a less-defined edge. Signature color tends to be a lighter green, with variable amounts of brown reflecting midseason leaf stress on individual trees. *Platanus racemosa* tends to occur on drier, rockier substrate, usually only in temporarily flooded settings. Overall cover of the stand is typically significantly lower. Unlike *Alnus rhombifolia, P. racemosa* rarely follows the margins of perennial streams.

***Alnus rhombifolia* Forest Alliance (1511)**




**DISTRIBUTION:** Very few stands are noted in the DRECP, mostly on the western edge of the ecoregion. In the current study area, seven stands of *Alnus rhombifolia* were mapped along Grapevine Canyon in the Jawbone North subarea.



## *Chilopsis linearis – Psorothamnus spinosus* Alliance (7222)

Desert willow – Smoke tree woodland Alliance

The dull grayish crowns of *Psorothamnus spinosus* are seen scattered in this aerial photo along the active wash and next to a *Parkinsonia florida* and *Olneya tesota* stand to the north.

The sprawling pastel gray to tawny short tree in the foreground is *Psorothamnus spinosus* occurring in a gravelly wash.

***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. The Alliance is composed of two Associations, The *Chilopsis linearis* Association and the *Psorothamnus spinosus* Association.

*Chilopsis* is usually higher cover than any other tree, although stands may contain similar cover of *Acacia greggii* and/or *Prunus fasciculata.* The Association 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 the Association 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. The Association 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* more likely 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 and analysis were performed for the Jawbone South and Owens Valley subareas. Florisitic 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). The Salton Sea region, which includes Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.

**PHOTOINTERPRETATION SIGNATURE:** 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 scattered apart and follow the edges of large high-energy washes, creating stands that are linear in shape with a white sandy substrate.

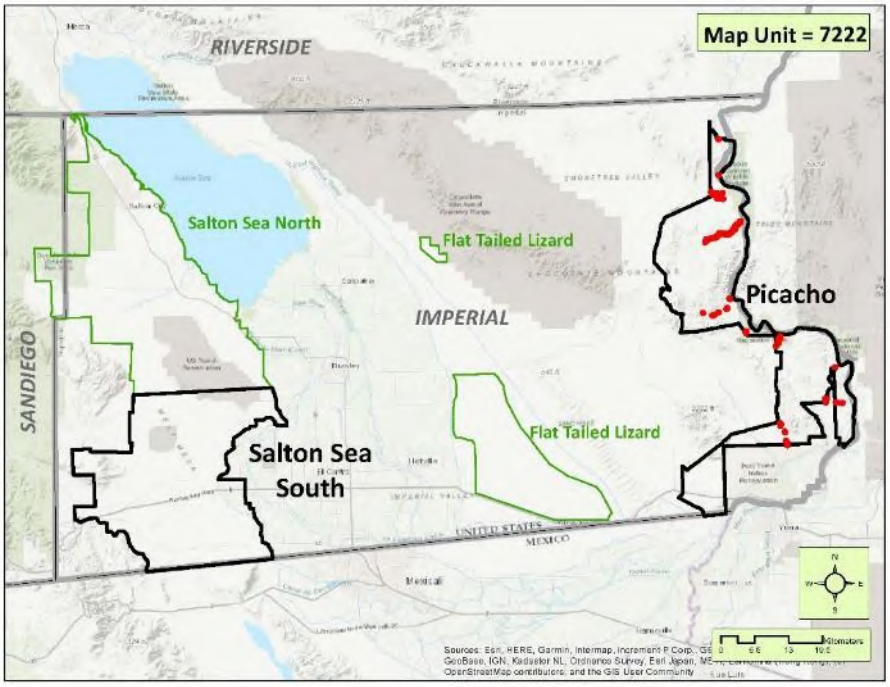
***Chilopsis linearis – Psorothamnus spinosus* Alliance (7222)**

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.

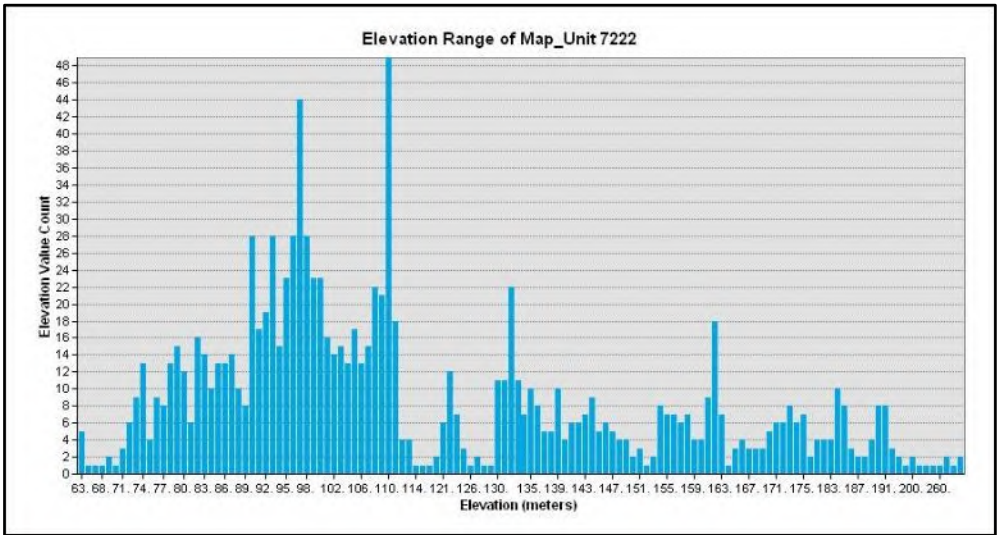
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Acacia greggii – Hyptis emoryi* Alliance (4226) – *Acacia greggii* shrubs typically have a smaller crown and tend to occur higher upstream into mountain valleys and narrow arroyos.
- *Ericameria paniculata* Alliance (4213) – Shrubs are smaller in size and occupy lower energy, less well-defined wash channels. Shrubs have a green to dark green color with a dense rounded crown.
- *Parkinsonia florida – Olneya tesota* Alliance (4227) – This dual-species Alliance occurs much more frequently in the mapping area and is limited to the Colorado Desert. Where the two Alliances co-occur, *Chilopsis* will occupy the most channelized portion of the largest wash systems, generally over a very small area. *Chilopsis* has a larger, denser and brighter green crown.
- *Prunus fasciculata – Salazaria mexicana* Alliance (7212) – *Prunus fasciculata* plants are rounded with well-defined dark green crowns.
- *Tamarix* spp. Semi-natural Stands (1432) – Typically Tamarix has a darker green color and is not restricted to washes and adjacent terraces.
- 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 mapped on Milpitas Wash, Vinagre Wash, Julian Wash, Carrizo Wash, Little Picacho Wash, Ferguson Wash, Senator Wash, and Unnamed Wash in the Picacho subarea.



## *Chilopsis linearis* Association (Formerly Alliance) (4224)

Desert willow woodland Association


The large grayish-green crowns of *Chilopsis linearis* are seen in a wash in this photo.

The sprawling bright green short tree in the foreground is *Chilopsis linearis* occurring in a gravelly wash.

***Chilopsis linearis* Association (4224)**

**DESCRIPTION:** Stands of this Association are dominated or co-dominated by *Chilopsis linearis,* which comprises at least 1 percent of the cover. *Chilopsis* is usually higher cover than any other tree, although stands may contain similar cover of *Acacia greggii* and/or *Prunus fasciculata.* The Association 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 the Association 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. The Association 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* more likely 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.

Note: As part of this project effort, additional classification data collection and analysis were performed for the Jawbone South and Owens Valley subareas. Florisitic 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). The Salton Sea region, which includes Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.

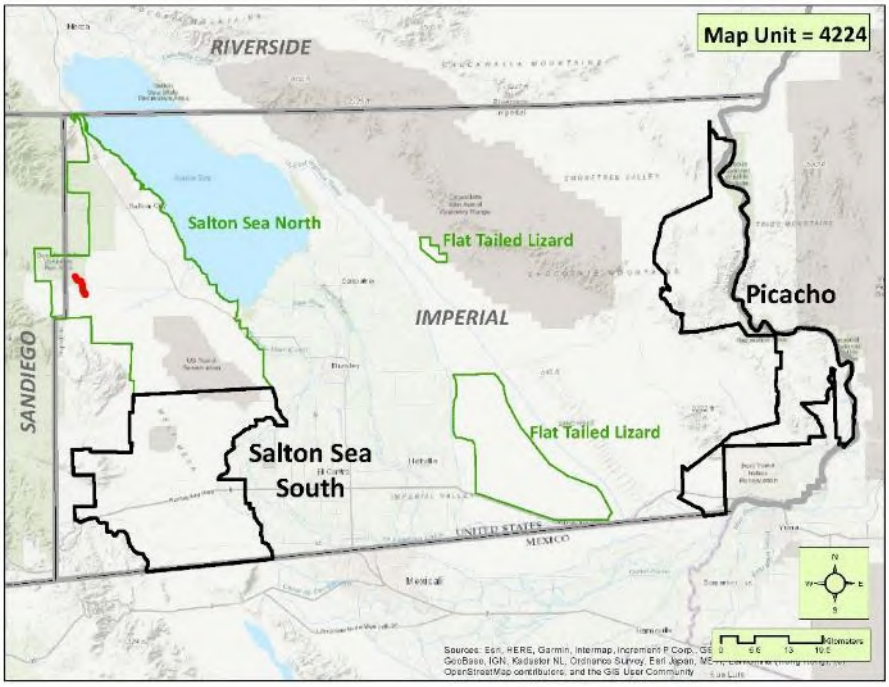
**PHOTOINTERPRETATION SIGNATURE:** Stands may be sparse to moderately dense in cover with individuals exhibiting a gray to grayish green, diffuse, irregularly shaped crown with a coarse texture. Individual plants can be quite large, at times measuring over 5 meters across. Plants appear scattered apart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

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

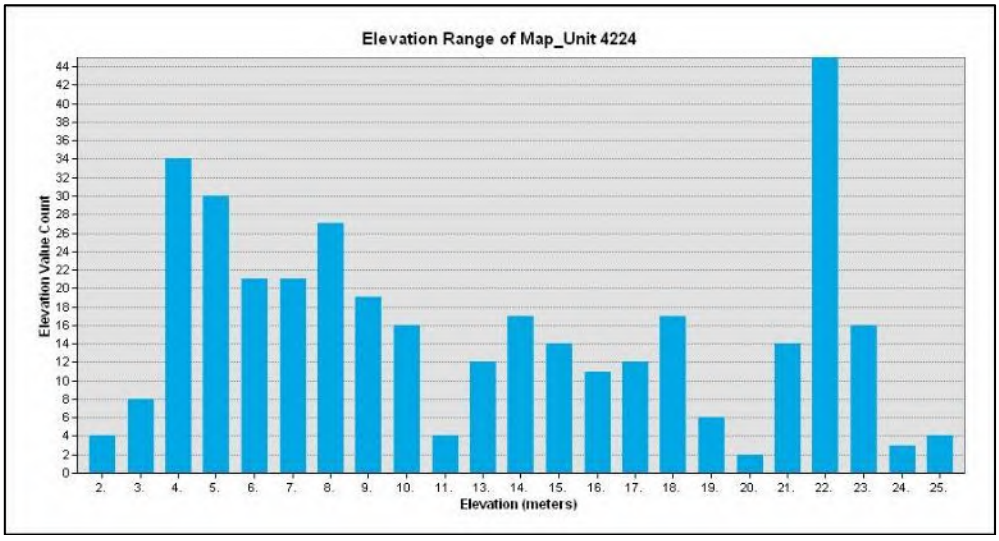
- *Acacia greggii – Hyptis emoryi – Justicia californica* Alliance (4226) – These shrubs typically have a smaller crown and tend to occur higher upstream into mountain valleys and narrow arroyos.
- *Ericameria paniculata* Alliance (4213) – Shrubs are smaller in size and occupy lower energy, less well-defined wash channels.
- *Parkinsonia florida – Olneya tesota* Alliance (4227) – This dual-species Alliance occurs much more frequently in the mapping area and is limited to the Colorado Desert. Where the two Alliances co-occur, *Chilopsis* will occupy the most channelized portion of the largest wash systems, generally over a very small area. *Chilopsis* has a larger, denser and brighter green crown.

- *Psorothamnus spinosus* Association (4225) of the *Chilopsis linearis – Psorothamnus spinosus* Alliance – *P. spinosus* has smaller, lighter-colored crowns are not as dense and also tend to have a poorly defined margin. The irregular branching and upright growth patterns of this species many times displays shadows within or along the edge of the crown. This type is also found more in the center of active high energy channels; however, unlike *C. linearis,* they are not limited to large wash systems.
- *Tamarix* spp. Semi-natural Stands (1432) – Typically this plant has a darker green color and is not restricted to washes and adjacent terraces.

***Chilopsis linearis* Association (4224)**




**DISTRIBUTION:** The highest concentration of stands occurs in the lower washes coming out of the eastern San Bernardino and Bighorn Mountains, and in the Central and Eastern Mojave Desert. Stands are found in large washes draining into the Mojave River, and in drainages on the north side of Joshua Tree National Park. Stands were rarely found in the Colorado Desert portion of the DRECP. In the current study area, eight polygons have been mapped along San Felipe Creek in the Salton Sea North subarea.



## *Psorothamnus spinosus* Association *(formerly* Alliance) (4225)

Smoke tree woodland Alliance

The photo shows the irregularly shaped gray crown of *Psorothamnus spinosus* dominating a wash channel with a few *Parkinsonia florida* seen in the lower end of the stand as the larger, green crown.

In this example *Psorothamnus spinosus* dominates a wash, and displays its characteristic grayish-blue crown and upright sprawling branches.

***Psorothamnus spinosus* Association (4225)**

**DESCRIPTION:** In this Alliance, *Psorothamnus spinosus* is dominant or co-dominant in the tree canopy**.** *Psorothamnus spinosus* is consistently distributed in low-energy washes, normally at greater than 1 percent cover. 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.* It is often associated with *Ericameria paniculata* or *Ambrosia salsola* washes, and occasionally with *Ephedra californica* stands.

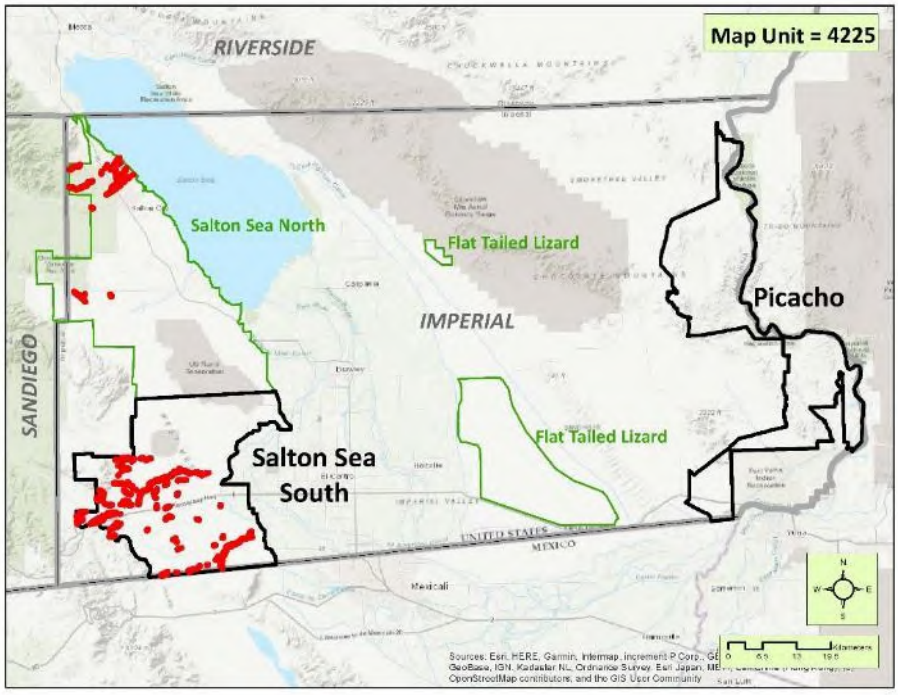
Note: As part of this project effort, additional classification data collection and analysis were performed for the Jawbone South and Owens Valley subareas. Florisitic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Chilopsis linearis* Alliance (4224) and *Psorothamnus spinosus* Alliance (4225) were reassigned as Associations of the new *Chilopsis linearis – Psorothamnus spinosus* Alliance (7222). The Salton Sea region, which includes Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.

**PHOTOINTERPRETATION SIGNATURE:** Stands 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.

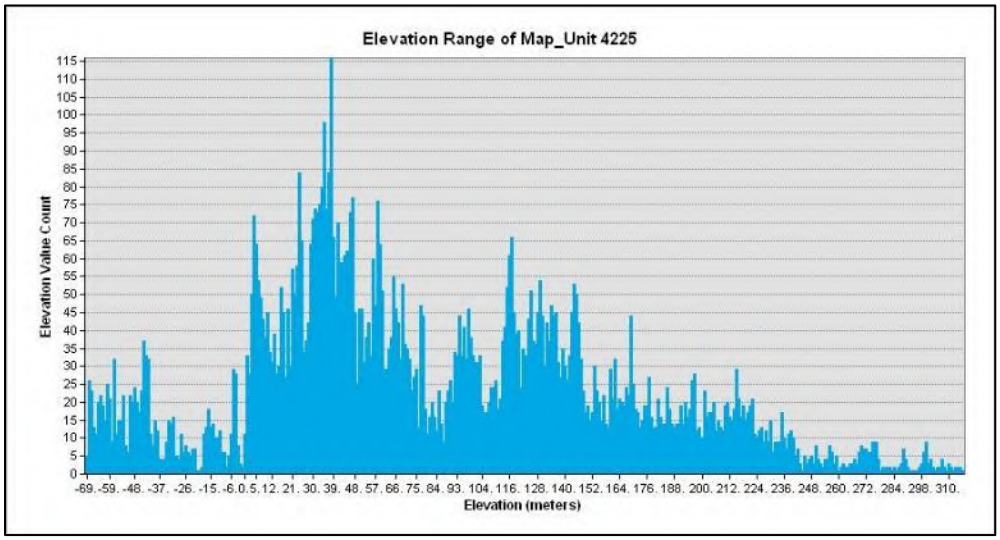
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Chilopsis linearis* Association (4224) of the *Chilopsis linearis – Psorothamnus spinosus* Alliance (7222) – *Chilopsis linearis* trees are typically larger in size and have rounded to irregularly shaped crowns with a coarse texture. Colors range from gray to grayish green.
- *Ericameria paniculata* Alliance (4213) – Shrubs have a green to dark green color with a dense rounded crown.
- *Prunus fasciculata Association (4214) of the Prunus fasciculata – Salazaria mexicana* Alliance (7212) – *Prunus fasciculata* plants are rounded with well-defined dark green crowns.
- 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.

***Psorothamnus spinosus* Association (4225)**




**DISTRIBUTION:** The highest concentration of stands occurs in drainages coming out of the Pinto Mountains between Twentynine Palms and Dale Dry Lake. There are some localized stands in the Central Mojave Desert. Additional stands are found in the Colorado Desert in the Chuckwalla Valley and along the Colorado River floodplain. In the current study area, *Psorothamnus spinosus* is mapped along several drainages in the vicinity of Salton City, and on San Felipe Creek and Fish Creek in the Salton Sea North subarea; and along several drainages out of the Coyote Mountains and on the Yuha Desert in the Salton Sea South subarea.



## *Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia* Semi-natural Alliance (1611)

Eucalyptus – Tree of heaven – Black locust groves Alliance

The image highlights a muted brownish green stand of immature *Ailanthus altissima* situated in a wash adjacent to *Ericameria nauseosa* stand to the north. In this post fire disturbance setting, the rapid growth and recovery of this species is characteristically identified by its dense clonal patches.

This photo displays the clonal suckering of *Ailanthus altissima* in a post fire disturbance stand.

***Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia* Semi-natural Alliance (1611)**

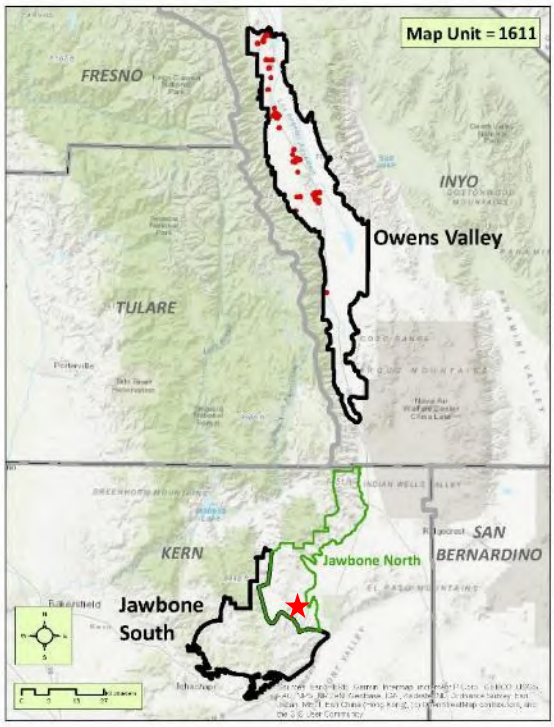
**DESCRIPTION:** *Robinia pseudoacacia* or *Ailanthus altissima* is strongly dominant, occurring in small to medium sized densely wooded stands. Stands appear to be invading riparian vegetation, including willow and cottonwood. *R. pseudoacacia* stands occur along the entire length of the Owens Valley. One stand of *Ailanthus altissima* is mapped near Butterbredt Spring.

**PHOTOINTERPRETATION SIGNATURE:** *Robinia pseudoacacia* yields a signature that is dark greenish in color with a grayish hint in the tone. Crown size is rather small for the height of the stand, and crown edges have a somewhat feathery texture. *Ailanthus altissima* appears in dense clonal patches that range from dark green to dull brownish green. Adjacent riparian vegetation is a common occurrence, with the riparian species yielding a brighter green color.

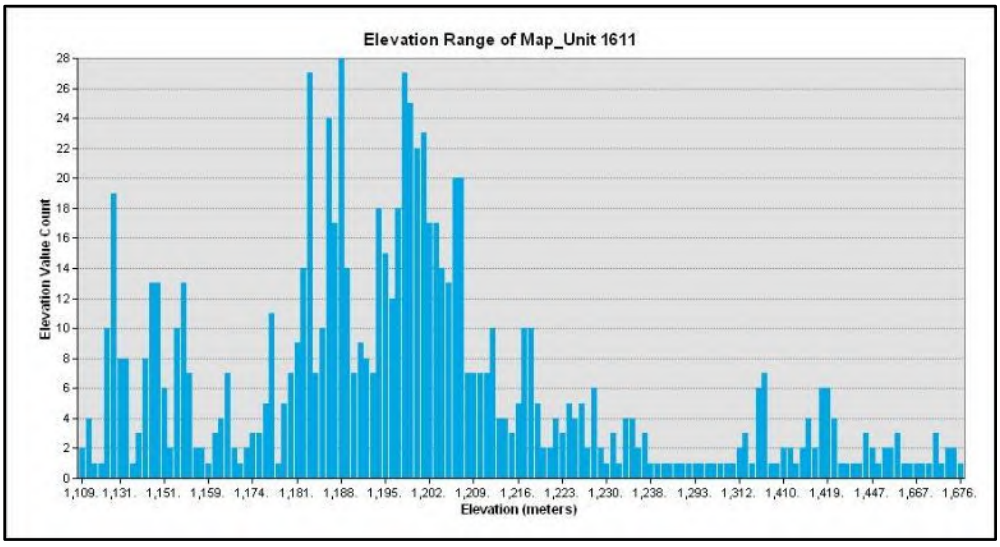
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Populus fremontii – Fraxinus velutina – Salix gooddingii* Alliance (1411) – Stands dominated with cottonwoods tend to have a larger more rounded and well defined crown, yielding a brighter green signature.
- *Salix laevigata – Salix gooddingii* Alliance (1416) – This alliance is defined by the dominance of either tree willow species and tends to yield a more reliable medium-green signature, with a hint of a yellowish cast. Individual sub-crowning can be visible in larger trees and crown edges are more sharply defined. Both riparian tree types are at times invaded by the *Robinia,* in some areas completely taking over the stand.

***Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia* Semi-natural Alliance (1611)**




**DISTRIBUTION:** In the current study area, *Robinia pseudoacacia* invades riparian stands along numerous tributaries of the Owens River, primarily along the interstate 395 corridor. One of the most extensive stands occurs just east of Fish Hatchery Road near the Fort Independence Reservation in the Owens Valley subarea. One stand (represented as a star) of *Ailanthus altissima* occurs near Butterbredt Canyon in the Jawbone North subarea.



## *Juniperus californica* Alliance (1122)

California juniper woodland Alliance

In this example, *Juniperus californica* occurs in cover ranging from less than 3 percent to more than 20 percent over a moderately dense shrub understory of *Eriogonum fasciculatum*. This site is an urban fringe example with severe off-highway vehicle activity.

*Juniperus californica* dominates the overstory on the hills in the background over a fairly dense cover of *Eriogonum fasciculatum.*

***Juniperus californica* Alliance (1122)**

**DESCRIPTION:** In this Alliance *Juniperus californica* is the dominant species in the tree layer. Cover can vary considerably within the stand. Very sparse stands of *Juniperus californica* are mapped as this alliance when *J. californica* is continuous throughout the stand and dominant in the tall shrub layer. Where *J. californica* is less than 5% absolute cover and evenly distributed with tall shrubs, the other shrubs must have strong dominance to be mapped to their own alliances. *Yucca brevifolia* is often a component to the stand, and when relative cover of *Y. brevifolia* reaches approximately a third of the canopy or greater, the Alliance is assigned to *Y. brevifolia* Alliance. Stands at lower elevations away from the mountain foothills tend to have *Yucca brevifolia* in the canopy. Higher elevation stands on slightly steeper slopes often have a component of *Pinus monophylla*. If *J. californica* is present at less than 10% cover and *P. monophylla* is present at greater than 3% absolute cover, then the stand is mapped to the *P. monophylla* Alliance. If *J. californica* is greater than 10% cover, and is co-dominant with *P. monophylla*, then the stand is mapped to *P. monophylla* Alliance. *Quercus john-tuckeri* will often be a component to stands in the southern Sierra Nevada, and in stands closer to Cajon Pass in areas that transition to semi-desert chaparral. Where *Q. john-tuckeri* reaches 30% relative cover, the stand is mapped to the *Q. john-tuckeri* Alliance. Stands mapped as *J. californica* in the far west near Gorman and in the southern Sierra Nevada will occasionally have *Quercus douglasii* as a co-dominant. Where *Quercus douglasii* co-dominates then the stand is mapped as the *Q. douglasii* Alliance.

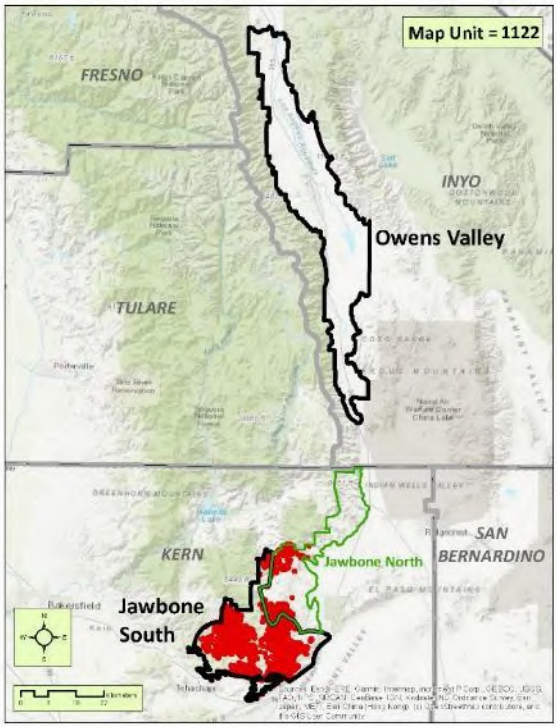
Note: There is a criteria change from previous DRECP mapping where co-dominance of *Q. douglasii* with *P. sabiniana* or *J. californica* were mapped as those Alliances respectively (Menke et al., 2013).

**PHOTOINTERPRETATION SIGNATURE:** One of the more conspicuous features of *Juniperus californica* is the crown shape, which is uniformly rounded regardless of the cover density. *Juniperus californica* is easily recognizable by other crown-related features including the green to dark green color visible on most image sets. (Midwinter imagery will accentuate these colors less, due to the low sun angle.) In the southernmost areas of the southern Sierra Nevada, crown die-back is evident within the canopy as gray patches where portions of the crown has died. Crown margins are very distinct and overall heights are fairly uniform throughout the stand. Cover densities can vary considerably within the stand. *J. californica* can sometimes occur over a grassy herbaceous understory, but more often over a sparse to moderately dense shrub layer. Understory shrubs are for the most part facultative deciduous and significantly smaller than the juniper. Isolated small patches of juniper on desert mountain ranges can be difficult to discern; imagery should be closely reviewed on north-trending slopes above 4500 feet (1370 meters) for these small stands.

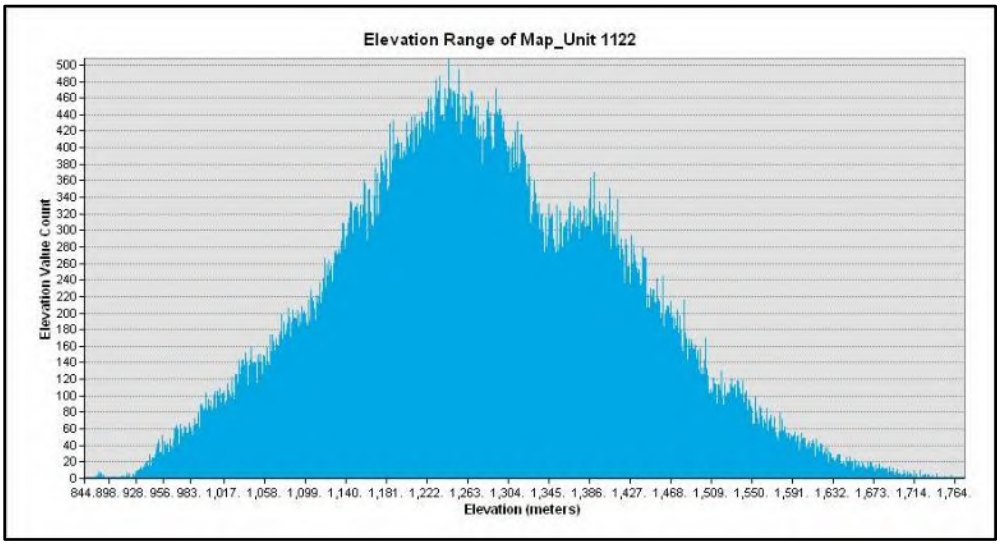
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Pinus monophylla* Alliance (1311) – This tree has a more irregularly shaped crown and displays a more blue-gray color. Higher elevation stands often contain both conifers, but when scattered consistently in the stand, *Pinus monophylla* is generally considered to be the Alliance. Due to their distinct crown characteristics, the two species are easily separable when co-occurring in the stand.
- *Quercus john-tuckeri* Alliance (3312) – This species can occur nearby or as a component to the *Juniperus californica* Alliance and can be distinguished primarily by the crown color, generally trending more toward the brown and gray ranges of the color spectrum. Stands are usually found on somewhat steeper slopes located more within the semi-desert chaparral zone a little further from the desert margins. Stands of *Quercus john-tuckeri* usually contain less of a *Yucca brevifolia* component.

***Juniperus californica* Alliance (1122)**

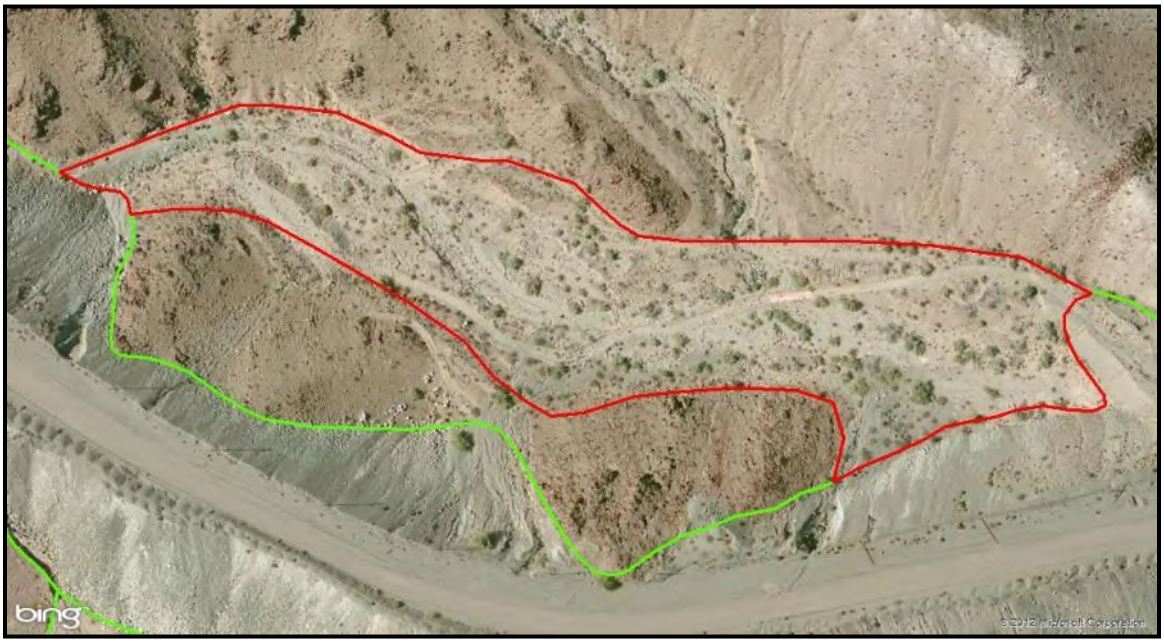



**DISTRIBUTION:** *Juniperus californica* occurs along the foothills and adjacent fans at the westernmost edge of the DRECP. In the current study area, it is found extensively in the interior and desert foothills of the southern Sierra Nevada in the Jawbone North and South subareas.



## *Parkinsonia florida – Olneya tesota* Alliance (4227)

Blue palo verde – ironwood woodland Alliance




This image depicts a *Parkinsonia florida – Olneya tesota* wash. The light green *P. florida* contrasts with the gray crown of the *Olneya* trees.

The photo shows the taller *Olneya tesota* scattered along the gravelly wash. *Larrea tridentata* is scattered along the margins of the wash in the foreground.

***Parkinsonia florida – Olneya tesota* Alliance (4227)**

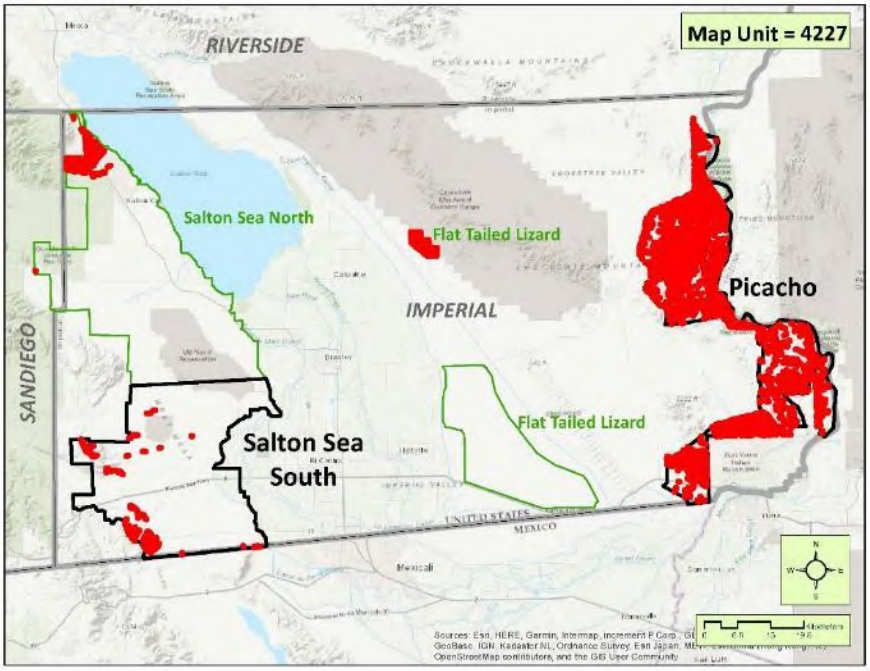
**DESCRIPTION:** In this Alliance, either *Olneya tesota* or *Parkinsonia florida* is dominant, or they co-dominate the tree canopy. They can occur together or on their own at usually greater than 2 percent cover. Associated species may include *Larrea tridentata* and *Ambrosia salsola*, which may be similar in cover to *Olneya tesota* and/or *Parkinsonia florida*. Stands occur east and south of Joshua Tree National Park. They are usually found in washes but occasionally are spread out over the middle portions of large alluvial fan systems.

**PHOTOINTERPRETATION SIGNATURE:** *Parkinsonia florida* has a dense light green crown with a coarse texture and roughly defined crown margin. *Olneya tesota* has a grayish to gray-brown color with an irregularly shaped crown. Individuals of both species vary greatly in size within stands and can range from open to moderately dense in cover.

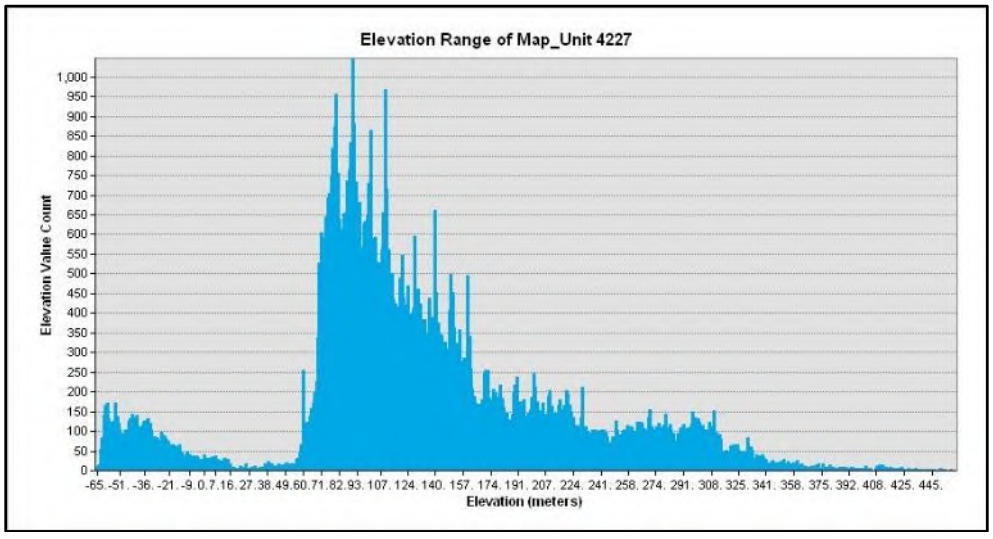
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Chilopsis linearis* Association (4224) of the *Chilopsis linearis – Psorothamnus spinosus* Alliance (7222) – Stands of *Chilopsis linearis* are infrequent within the range of the *Parkinsonia florida – Olneya tesota* Alliance. However, when present, they generally occur only along the margins of very large active wash systems adjacent to *Olneya* or *Parkinsonia*. Crowns are large and tend to be a brighter green. Small clusters of *Chilopsis* are dense and form irregular shapes.
- *Larrea tridentata – Ambrosia dumosa* Alliance (4115) – Stands in the Colorado Desert often contain a small emergent cover of *Olneya tesota* occupying small rivulets incised within broad, extensive alluvial deposits. Determining sparse cover values around the 3 percent threshold, which defines the *Parkinsonia – Olneya* Alliance, is often quite difficult especially when the trees are small.
- *Parkinsonia microphylla* Alliance (4152) – Stands dominated by the appropriately named Foothill palo verde are separated by their setting; they grow in the gentle to moderately sloping foothills of the Whipple and Chocolate Mountains. They generally maintain a consistent cover across the stand, usually in low to moderate cover. Large washes bisecting the foothills containing *Olneya tesota* are mapped to *Parkinsonia florida – Olneya tesota* Alliance.

***Parkinsonia florida-Olneya tesota* Alliance (4227)**




**DISTRIBUTION:** *Parkinsonia florida-Olneya tesota* Alliance occurs exclusively in the Colorado Desert region of the study area. These woodland stands are prevalent in lowland washes, active alluvial fans, and higher gradient canyon washes throughout this region. Almost all stands occur below 800 meters in elevation. In the current study area, stands of this Alliance are prevalent throughout the Chocolate Mountains, Palo Verde Mountains, and alluvial fans of the Picacho subarea. It also is mapped in the on the alluvial fans in the vicinity of Mammoth Wash in the Flat-Tailed Horned Lizard subarea; on the alluvial fans and washes above Salton City in the Salton Sea North subarea; and in selected washes of the Coyote Mountains and alluvial fans of West Mesa and the Yuha Desert in the Salton Sea South subarea.



## Pinus jeffreyi Alliance (1213)

Jeffrey pine forest Alliance

In this screen shot, the taller *Pinus jeffreyi* dominates this dense stand with components of *Quercus kelloggii* and *Q. chrysolepis*.

*Pinus jeffreyi* occurs in a dense stand along the ridgeline in the background of this photo, with a homogenous patch of *Quercus chrysolepis* in the foreground. Also note the standing dead snags of *P. jeffreyi* and *A. concolor* in the area.

***Pinus jeffreyi* Alliance (1213)**

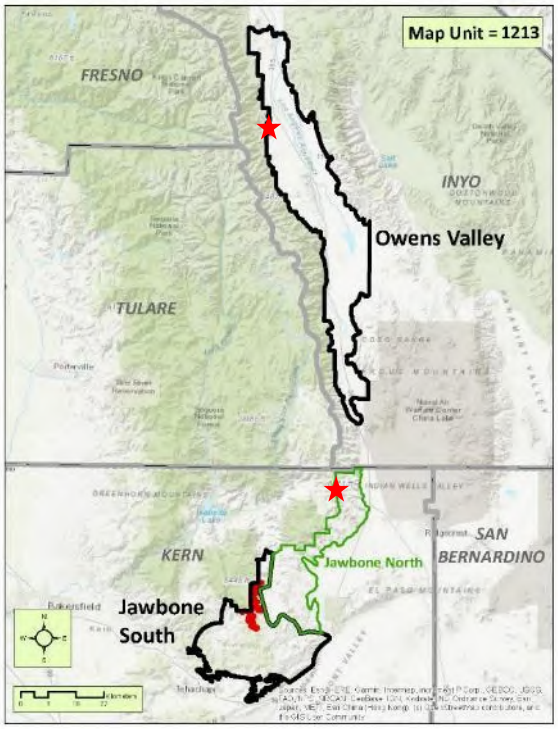
**DESCRIPTION:** In this Alliance *Pinus jeffreyi* is dominant to co-dominant in the tree overstory, many times mixing with *Quercus chrysolepis* or *Quercus kelloggii. Abies concolor* commonly occurs as a minor component with *P. jeffreyi* in the upper canopy. In some areas, stands may have a component of standing dead trees scattered throughout the canopy. In the DRECP, the Pinus jeffreyi Alliance is only found along mid to upper elevations of the southern Sierra Nevada such as the Piute Peak and Owens Peak areas.

**PHOTOINTERPRETATION SIGNATURE:** *Pinus jeffreyi* individuals have a blue-gray or pale green color with mature trees displaying a broader, irregularly branching crown, whereas younger trees appear rounder and more symmetrical. Many times dark green *Q. kelloggii* and lighter green *Q. chrysolepis* are seen in the tree sub-canopy with the taller *P. jeffreyi* casting a small shadow above the oaks. Dead snags appear light brown in color on recent imagery, in obvious contrast to the greener living foliage in the oak sub-canopy and/or chaparral understory.

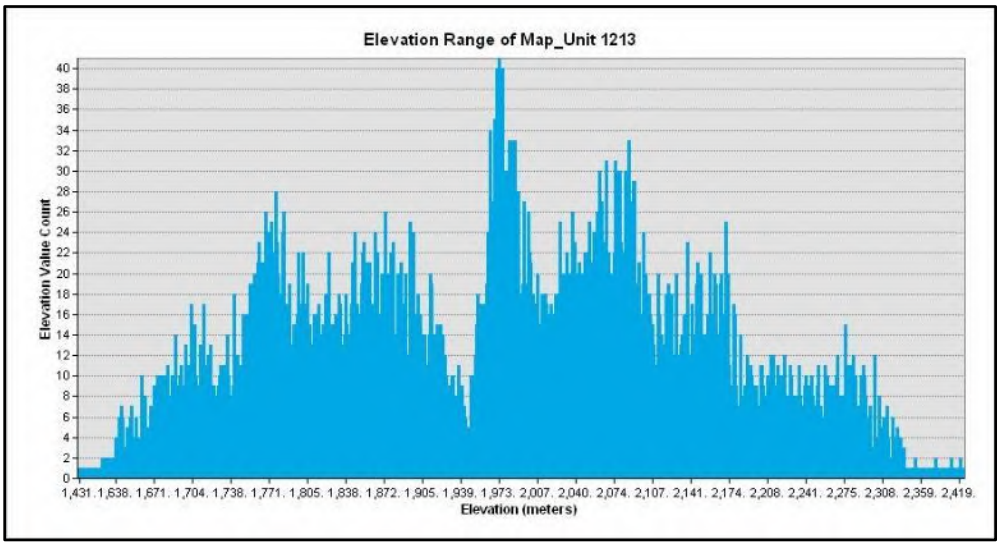
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Quercus chrysolepis* Alliance (1113) – Usually this species is easily distinguishable as a large evergreen oak co-dominating the stand with the taller and paler green-colored *Pinus jeffreyi*. When there are significant standing dead in the area, the sub-canopy and/or understory is obscured by the dead conifers in the upper canopy, limiting the photointerpreter's ability to evaluate relative cover accurately. In settings where the two co-dominate, the stand is classified to the *Pinus jeffreyi* Alliance.
- *Quercus kelloggii* Alliance (1118) – Usually this species is easily distinguishable as a large dark green deciduous oak co-dominating the stand with the taller and paler green-colored *Pinus jeffreyi.* When there are significant standing dead in the area, the sub-canopy and/or understory is obscured by the dead conifers in the upper canopy, limiting the photointerpreter's ability to evaluate relative cover accurately. In settings where the two co-dominate, the stand is classified to the *Pinus jeffreyi* Alliance.

***Pinus jeffreyi* Alliance (1213)**

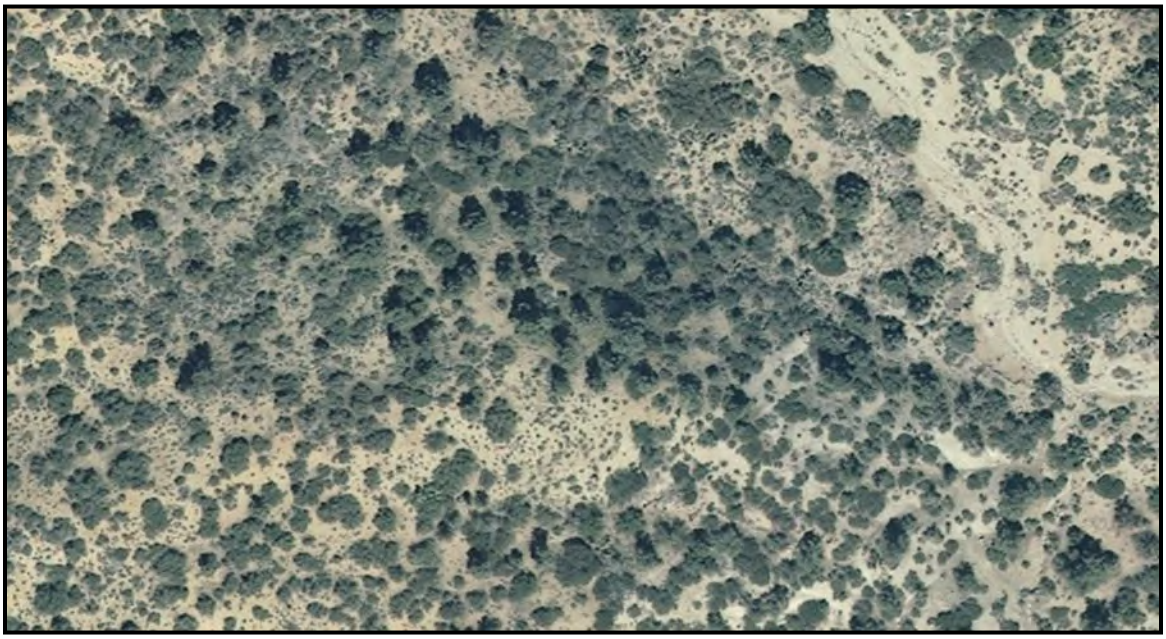



**DISTRIBUTION:** *Pinus jeffreyi* Alliance is found at the western edge of the DRECP area. In the current study area, it is mapped on the Piute Mountains and in the interior southern Sierra Nevada of the Jawbone South subarea; and at Owens Peak (represented by as star) in the Jawbone North subarea. In addition, one polygon is mapped along Independence Creek in the Owens Valley subarea.



## *Pinus monophylla* Alliance (1311)

Singleleaf pinyon woodland Alliance



In this example, *Pinus monophylla* is a sparse emergent to an understory of tall shrubs including *Quercus john-tuckeri* and *Arctostaphylos glauca.* A secondary smaller shrub layer of *Eriogonum fasciculatum* is scattered throughout the stand. Note: this screenshot is a portion of a larger polygon whose boundaries are not shown.

This photo shows *Pinus monophylla* over a tall shrub layer of *Juniperus californica* and *Quercus john-tuckeri* on a steep, protected slope.

***Pinus monophylla* Alliance (1311)**

**DESCRIPTION:** In this Alliance *Pinus monophylla* is evenly distributed throughout the stand. Stands may have equal or higher cover of *Juniperus californica, Yucca brevifolia,* and/or shrubs such as *Quercus john-tuckeri*. In dense chaparral stands, where shrubs, such as *Fremontodendron californica, Cercocarpus montanus, Arctostaphylos glauca, Arctostaphylos glandulosa*, etc. are greater than 25% absolute cover, then *P. monophylla* must be greater than 8 to 10% cover to be mapped as this Alliance. However, in sparse stands where chaparral shrubs are less than 10% absolute cover, then *P. monophylla* must be greater than 3% absolute cover to me mapped as *P. monophylla* Alliance. If *Yucca brevifolia* is present and greater than 1% cover, the stand must have greater than 3 times as much *P. monophylla* to be *P. monophylla* Alliance (*Y. brevifolia* takes precedence when co-dominant). If *Juniperus californica* is present, *Juniperus* must have greater than 3 times as much absolute cover as *P. monophylla* (which takes precedence when co-dominant). At higher elevations, on steeper slopes, *Quercus chrysolepis* may be present or co-dominate in these stands. *Quercus wislizeni* may also be present or co-dominate with *Pinus monophylla*. Some stands of *P. monophylla* may have considerable die-back and standing dead snags which make accurate assessments of the living relative covers more difficult.

Note that there is a criteria change from previous DRECP mapping where *Pinus monophylla* required a minimum 1% absolute cover. (Menke et al., 2013).

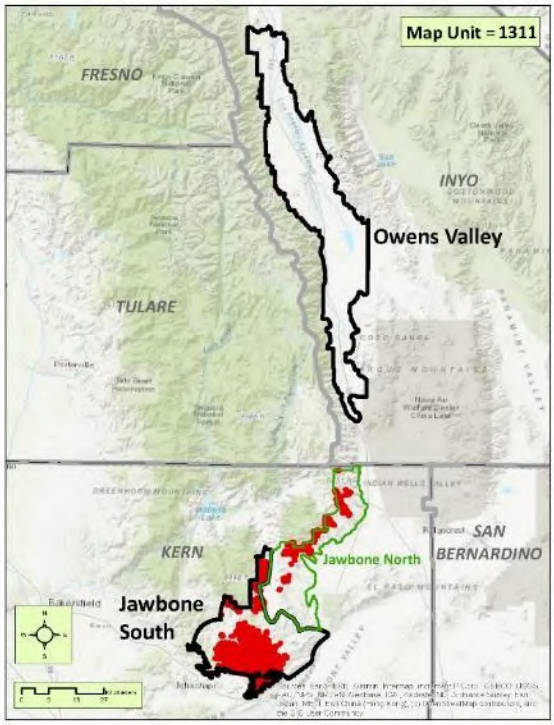
**PHOTOINTERPRETATION SIGNATURE:** Typical stands in the *Pinus monophylla* Alliance do not often contain a strong conifer component, and therefore the pinyons in the stand are not representative of the overall signature of the mapped polygon. *P. monophylla* is detectable as an emergent to the understory tall shrub layer and is identified by the narrow irregularly shaped crown which generally is gray to blue-gray. When *P. monophylla* is a stronger component to the stand, the characteristic blue-gray signature becomes more evident. Stands can be difficult to delineate due in part to the sparse pine cover and the steep, protected, often north-trending settings in which they are found. When stands mix with *Juniperus californica,* the more rounded, brighter green juniper crowns contrast fairly well with the pines. Stands occurring over chaparral species such as *Arctostaphylos glauca* yield a greater height contrast with less of a distinction in colors. It is common for stands to have a number of standing dead trees scattered throughout the overstory.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

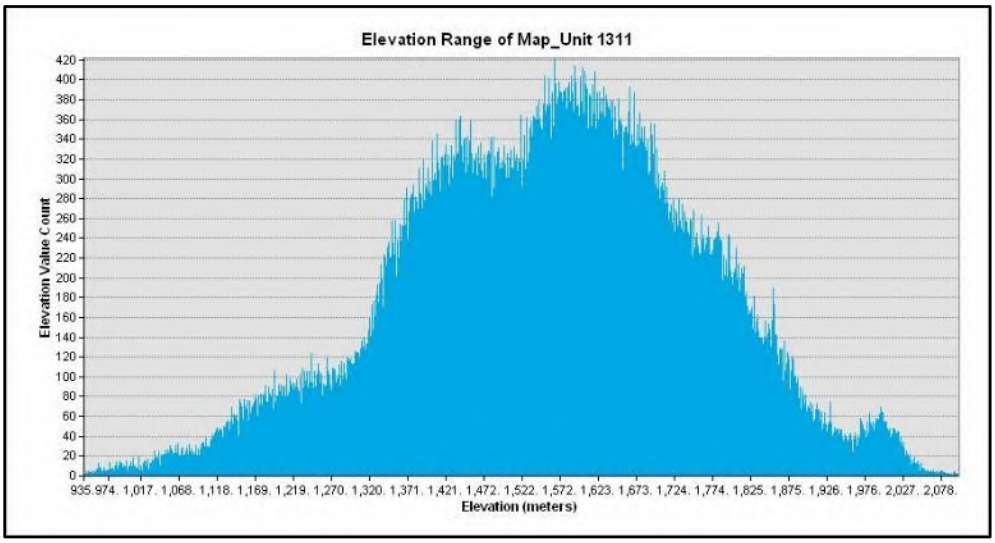
- *Juniperus californica* Alliance (1122) – This species occurs at lower elevations on gentler slopes closer to the desert edge. Individuals have distinctly rounded crowns and tend usually to be brighter green. Individual crowns are denser and have more distinct margins. Mixed stands of *J. californica* and *P. monophylla* many times exhibit die-back on the imagery, which hinders the photointerpreter's ability to accurately determine relative living cover.

- *Pinus sabiniana* Alliance (1121) – *Pinus sabiniana* can be identified by the irregularly shaped, multiple-branching crown and its characteristically blue-gray color. On average, *P. sabiniana* individuals are taller, accentuated by longer shadows, and tend to occur in localized clusters. Comparatively, *P. monophylla* has a similar color but a shorter stature, tighter more rounded crown, and the distribution pattern is typically evenly scattered and open across the stand.
- *Quercus chrysolepis* Alliance (1113) – This type occurs at similar elevations but in more mesic settings in areas receiving higher precipitation. Stands are generally higher in tree cover. *Quercus chrysolepis* has a larger, denser crown and is more rounded with a distinct margin. Stands can have a low cover of *Pinus monophylla*, but if co-dominant then the stand is classified to the *Pinus monophylla* Alliance. Some areas may exhibit significant conifer die-back which inhibited the mapper's ability to determine relative living cover.
- *Quercus wislizeni* Alliance (1114) – Stands are recognizable by the dark green but variable color occurring throughout most of the stand. Stand color variability is due in part to other chaparral species co-dominating portions of the stand and the amount of dead vegetation present. Cover can be very dense in protected areas and more open in rockier, mid to higher elevations. Stand margins are often difficult to distinguish since they are often adjacent to other post burn chaparral types found in more xeric settings such as *Quercus john-tuckeri, Pinus monophylla,* and *Adenostoma fasciculatum.* Many times, when mixed with *P. monophylla*, the die-back of the pines makes it difficult to assess on the imagery whether enough of the pines are alive, therefore inhibiting the ability for the mapper to assess relative cover of the species. When these two species are co-dominant, the stand is assigned to the *Pinus monophylla* Alliance.

***Pinus monophylla* Alliance (1311)**

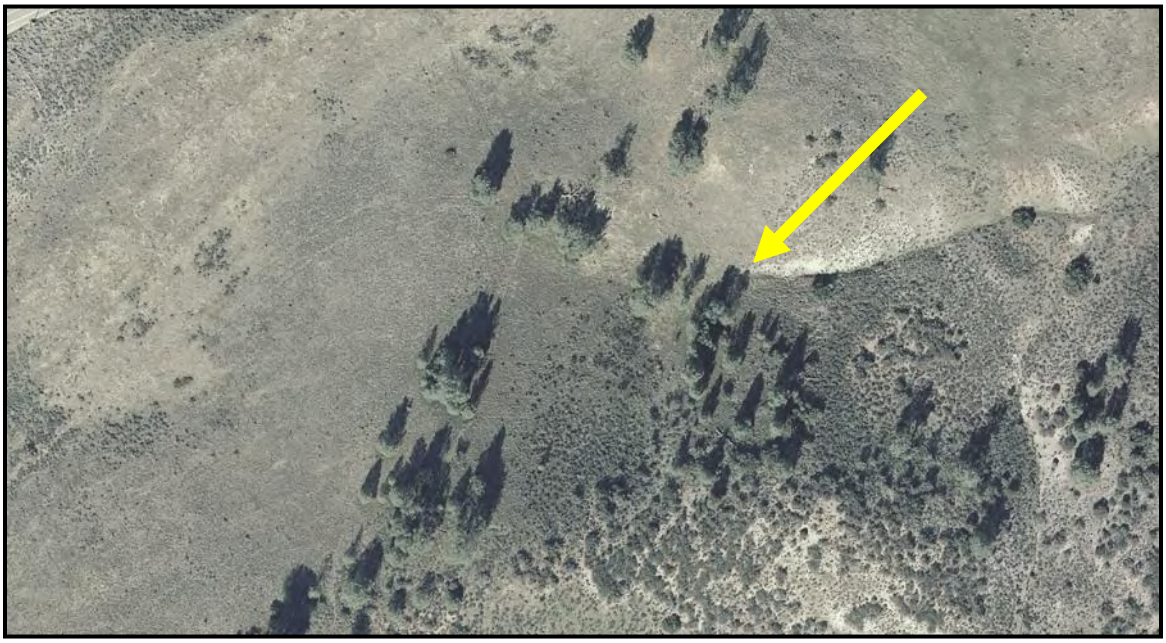



**DISTRIBUTION:** *Pinus monophylla* occurs at upper elevations in the mountains at the westernmost edge of the DRECP. In the current study area, it is found in the interior and desert foothills of the southern Sierra Nevada of the Jawbone South subarea; and upper desert foothills of the eastern Sierra Nevada of the Jawbone North subarea.



## *Pinus sabiniana* Alliance (1121)

Foothill pine woodland Alliance



This photo shows *Pinus sabiniana* scattered toward the center, adjacent to several small patches of *Adenostoma fasciculatum* and *Eriogonum fasciculatum*. In this example, polygon delineations are removed to accentuate the crown characteristics of the individual pines.

*Pinus sabiniana* occurs along the ridgeline above grassy slopes covered with *Eriogonum fasciculatum.*

***Pinus sabiniana* Alliance (1121)**

**DESCRIPTION:** In this Alliance *Pinus sabiniana* is the strongly dominant tree in the overstory, comprising more than 60 percent of the relative tree cover in a stand. Overall canopy cover is generally over 10 percent. Stands identifiable as the Alliance occur largely over herbaceous or mixed chaparral shrub/herb understories. Stands occur in the westernmost part of the DRECP, on lower slopes along base of Liebre Mountain, and in the southern Sierra Nevada. Typically, *P. sabiniana* is mapped to other tree Alliances since it rarely strongly dominates the stand.

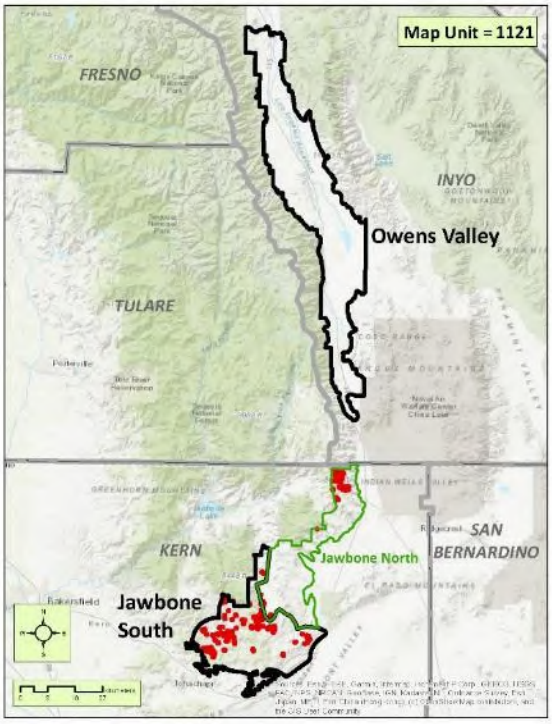
Note: There is a criteria change from previous DRECP mapping where co-dominance of *Q. douglasii* with *P. sabiniana* or *J. californica* were mapped as those Alliances respectively (Menke et al., 2013).

**PHOTOINTERPRETATION SIGNATURE:** *Pinus sabiniana* can be identified by the irregularly shaped, multiple-branching crown and its characteristically blue-gray color. *Pinus sabiniana* can, however, be in close proximity to stands of *Quercus douglasii, Eriogonum fasciculatum* or open grasslands. Since most stands occur over a short shrub layer or in open grasslands, main stems are entirely visible and appear angular, typifying the growth patterns of this species of pine. These growth patterns and crown characteristics, especially visible with higher-resolution imagery, generally make the identification of this type fairly straightforward.

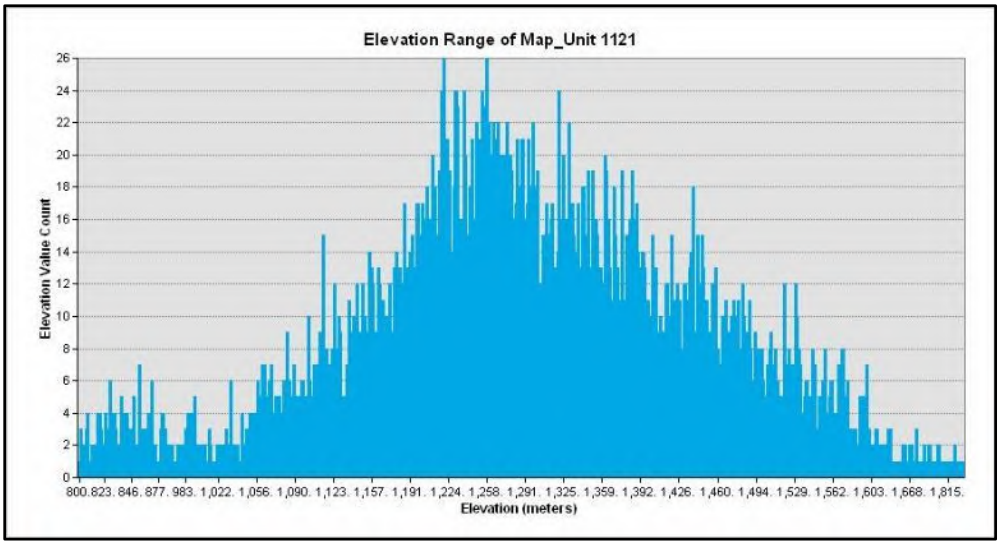
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Pinus monophylla* Alliance (1311) – *Pinus monophylla* has a similar blue-gray color but a shorter stature and tighter, more rounded crown. The distribution pattern is typically evenly scattered and open across the stand, compared to *P. sabiniana* which tends to occur in localized clusters.
- *Quercus douglasii* Alliance (1111) – This species yields a similar blue-gray color but generally has a rounded, less irregularly shaped crown. When *Pinus sabiniana* is emergent to a dense oak canopy, the two species can be differentiated primarily by their height.

***Pinus sabiniana* Alliance (1121)**




**DISTRIBUTION:** The *Pinus sabiniana* Alliance occurs in isolated small stands along the westernmost edge of the DRECP. In the current study area, it is mapped in the interior and desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas.



## *Platanus racemosa* Alliance (1414)

California sycamore woodlands Alliance

In this example, *Platanus racemosa* intermixes with *Populus fremontii* on a broad stream terrace near the confluence of two creeks.

*Platanus racemosa* dominates the tree canopy in this narrow stand.

***Platanus racemosa* Alliance (1414)**

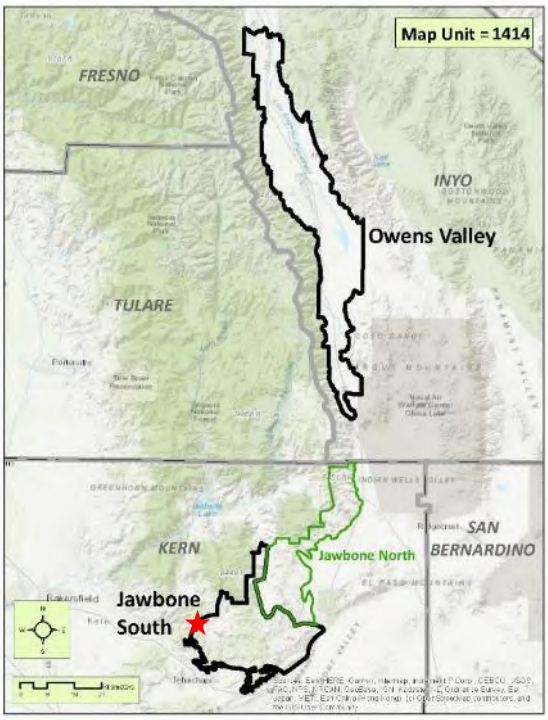
**DESCRIPTION:** *Platanus racemosa* dominates or co-dominates the riparian tree canopy with more than 8 to 10 percent cover. If present, *Populus fremontii* has less cover than *Platanus racemosa*. Stands of this Alliance are found along seasonally flooded stream courses in the non-desert portions of the study area and are often associated with other stands of riparian trees or shrubs. Individuals of *Platanus racemosa* occur on the Mojave River floodplain and at the edge of the mountains bordering the DRECP. Stands are more common in the Cajon Pass area and in the southern Sierra Nevada.

**PHOTOINTERPRETATION SIGNATURE:** *Platanus racemosa* has an open, irregularly shaped crown with the main stem (white color) visible on larger individuals. Crown color is usually medium green on healthy individuals; trees undergoing a leaf-stress phase tend to have a brownish tint. Understory vegetation can be grassy with a sparse shrub component but more often is sparsely vegetated with a cobble substrate.

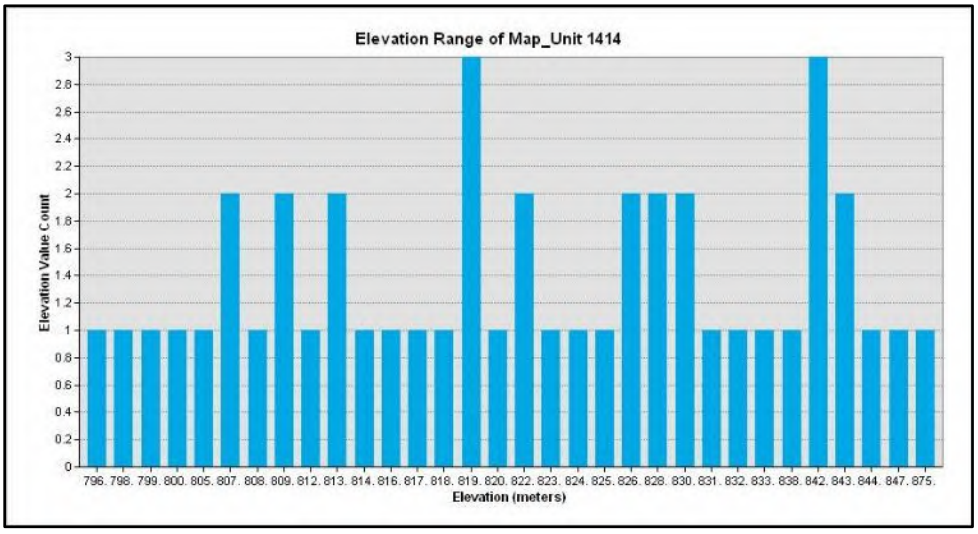
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Populus fremontii – Fraxinus velutina – Salix gooddingii* Alliance (1411) – *Populus fremontii* tends to have larger, more rounded crowns and overall has a darker green color. Both species can occur together in larger riparian woodlands and in narrow canyons fed by larger, seasonally flooded streams draining the Transverse Ranges and the southern Sierra Nevada.
- *Salix gooddingii – Salix laevigata* Alliance (1416) – Both types can occur in narrow, seasonally flooded canyons; *Salix laevigata* is also associated with small springs. Stands are denser but do not extend along the channel much below the water source and therefore are generally smaller. Crown colors vary less, and are almost always a fairly uniform green. Multiple crowning on larger individuals can at times be visible.

***Platanus racemosa* Alliance (1414)**




**DISTRIBUTION:** Stands are very limited in the study area and predominantly occur in protected canyons along major drainages in the mountains and foothills at the westernmost edges of the DRECP. In the current study area, *Platanus racemosa* is mapped in the interior southern Sierra Nevada of the Jawbone South subarea (represented as a star).



## *Populus fremontii – Fraxinus velutina – Salix gooddingii* Alliance (1411)

Fremont cottonwood – Velvet ash – Black willow forest Alliance


The photo depicts a “pure” stand of *P. fremontii* established in an active portion a wash.

The photo shows an emergent *P. fremontii* tree along the Colorado River floodplain.

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***Populus fremontii – Fraxinus velutina – Salix gooddingii* Alliance (1411)**

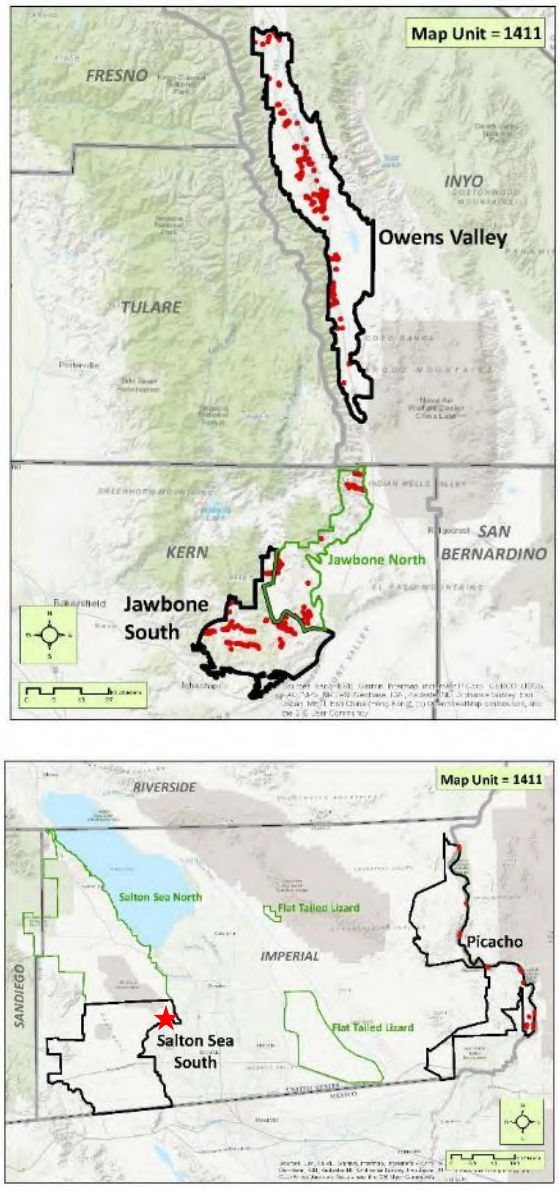
**DESCRIPTION:** In this Alliance *Populus fremontii* and/or *Fraxinus velutina* is dominant or co-dominant with over 5 percent absolute cover in the tree canopy. Stands occur along streams, springs, and valleys with a subsurface water supply. *P. fremontii* occurs with *Salix* spp., *Forestiera pubescens,* and *Baccharis* spp. among other species. Stands co-dominated by tree willows such as *Salix gooddingii* or *S. laevigata* are mapped as this Alliance. *Platanus racemosa* and *Salix laevigata*, if present, are each usually less than 5 percent cover. *Platanus* must have less cover than *Populus*. *S. gooddingii* may be co-dominant, and shrubby *Salix lasiolepis* or *Baccharis* spp. may be present at low to high cover in the understory**.**

**PHOTOINTERPRETATION SIGNATURE:** Stands occur in open to dense patches along riparian corridors. During leaf-on conditions, signature colors range from a medium to dark green. Crowns are generally large and variable in shape, tending to be rounded with distinct edges. Taller trees in open settings yield distinct shadowing. During leaf-off conditions the signature has a light gray to white, wispy appearance due to the exposed light-colored branches. Young stands in thicket-like settings tend to have a more even, smooth texture.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

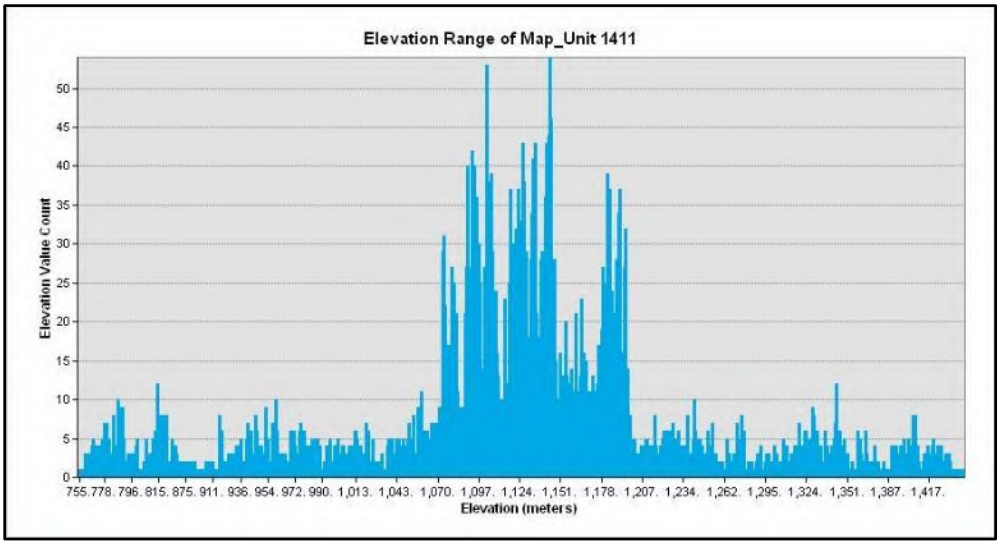
- *Platanus racemosa* Alliance (1414) – This species on average has a more irregularly shaped crown that is not as rounded as a mature cottonwood, lacking distinct crown margins. Stands of sycamore are much less common in the mapping area and tend to occur in slightly less flooded environments or in drier narrow canyons upslope from cottonwoods.
- *Salix laevigata – Salix gooddingii* Alliance (1416) – This species generally has a smaller, more distinct crown and can display multiple crowning in larger individuals. *Salix laevigata* also tends to have a brighter and lighter green color than *Populus fremontii*. However, it is extremely difficult for photointerpreters to ascertain relative abundance of the two species in a mixed stand, therefore at times it is difficult to make a determination between the two Alliances.

***Populus fremontii – Fraxinus velutina – Salix gooddingii* Alliance (1411)**

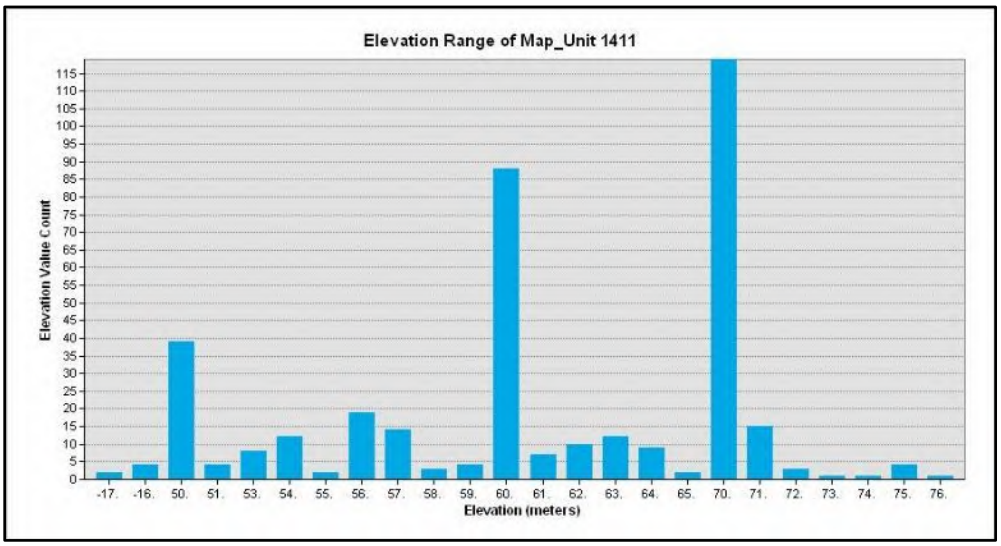



**DISTRIBUTION:** Stands are well-developed along portions of the Mojave and Colorado Rivers and along the westernmost edge of the DRECP. In the current study area it is found in the interior and desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas; on the Owen River floodplain and lower tributaries of the Owens Valley subarea; along the Colorado River in the Picacho subarea; and in one location (represented as a star) along the Filaree Canal in the Salton Sea subarea.

***Populus fremontii – Fraxinus velutina – Salix gooddingii* Alliance (1411)**




North subareas




South subareas

## 1512 – *Populus trichocarpa* Alliance (1512)

Black cottonwood forest Alliance

In this linear stand, light green *Populus trichocarpa* appears in the upper canopy with a slight shadow cast over a dense thicket of riparian shrubs.

This photo shows a confined riparian strip of emergent *Populus trichocarpa* over a dense thicket of *Salix lasiolepis* and *Betula occidentalis*.

***Populus trichocarpa* Alliance (1512)**

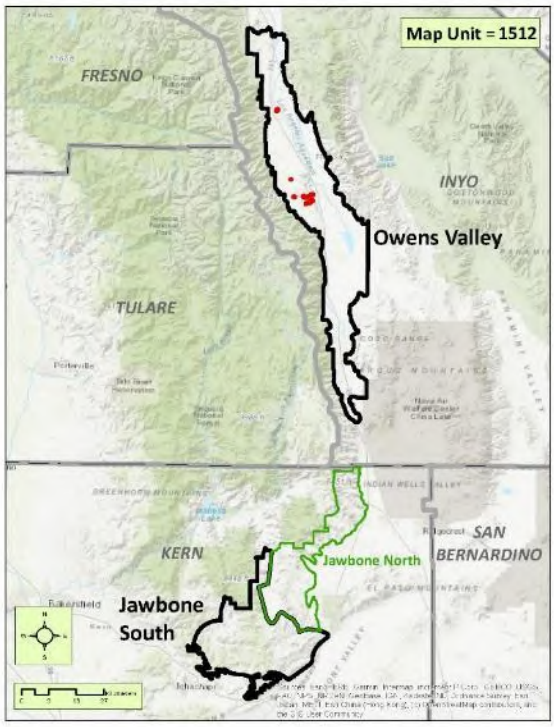
**DESCRIPTION:** *Populus trichocarpa* is dominant in the tree canopy, generally in high cover. They occur frequently in small stands as an emergent to an understory of *Betula occidentalis*. Several stands have emergent *Pinus jeffreyi* at low cover. Stands occur at higher elevations along the western fringes of the Owens Valley adjacent to seasonally and perennially flowing streams.

**PHOTOINTERPRETATION SIGNATURE:** *Populus trichocarpa* occurs infrequently in very small stands, and therefore a typical signature is difficult to ascertain. Where visible, texture is irregular, with plants varying in height across the stand. Other riparian species increase the variability across the landscape. The dark green leaf yields similar colors on summer acquired imagery with numerous dark gray interruptions due to shadowing from variable canopy height.

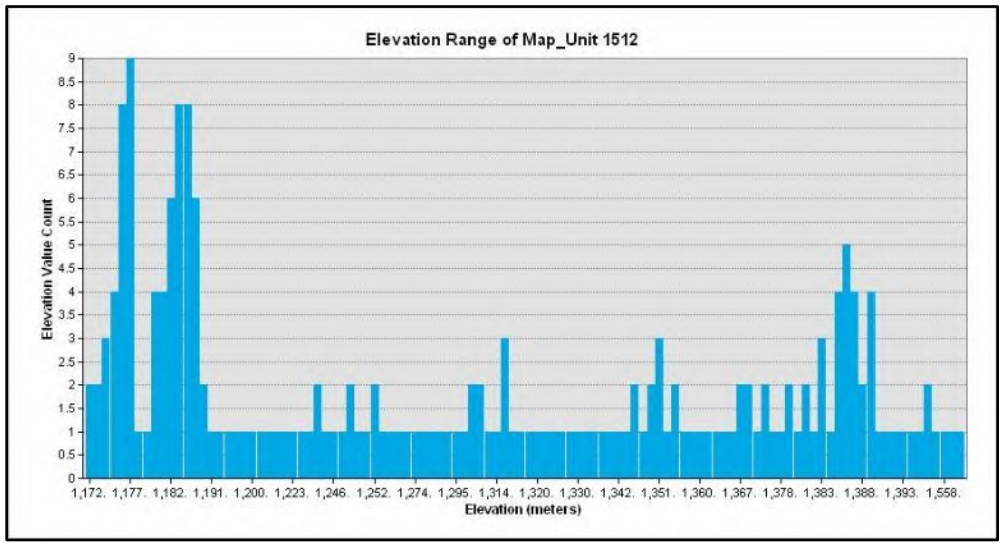
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Betula occidentalis* Alliance (1521) – This species frequently co-occurs adjacent and within stands dominated by *Populus trichocarpa.* Variable height yielding shadowing is indicator that the cottonwood is emergent in the canopy. If the emergent cover is greater than 10%, the stand is mapped to the *Populus trichocarpa* Alliance. Stands solely dominated with *Betula occidentalis* overall yield a less complex texture due to the more even height.

***Populus trichocarpa* Alliance (1512)**

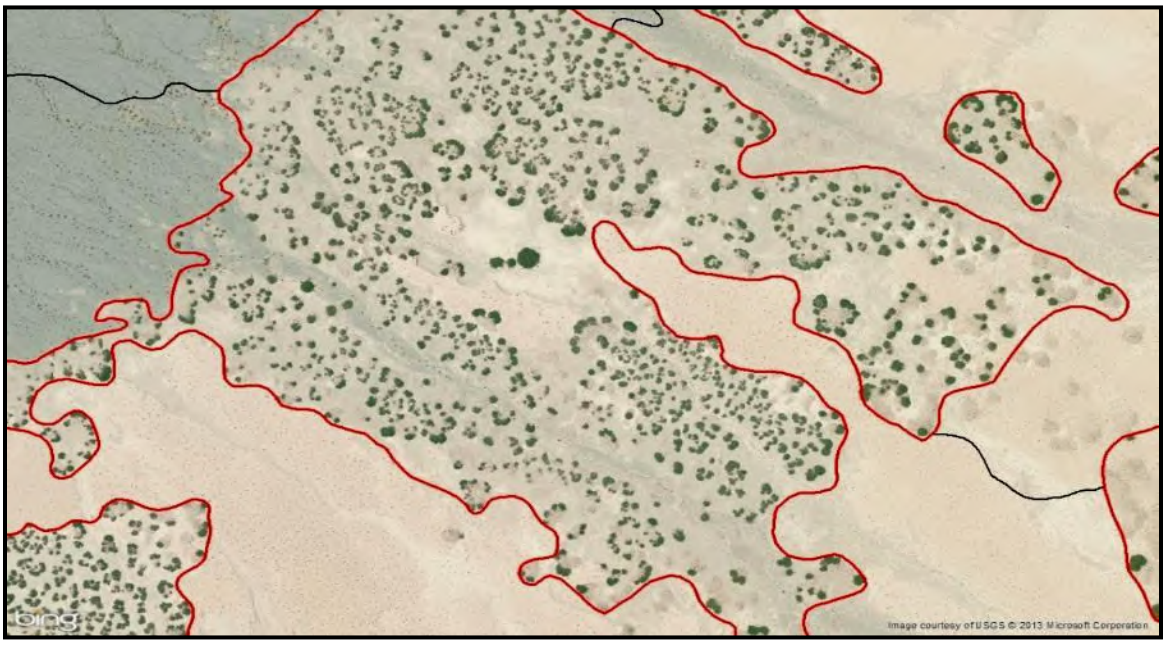



**DISTRIBUTION:** In the current study area, *Populus trichocarpa* is mapped along several perennial tributaries west of the Owens River in the Owens Valley subarea, east of the Sierra Nevada. Best examples occur along Lone Pine Creek in the Alabama Hills in elevations between 2400 and 4500 feet in elevation.



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

Mesquite bosque, mesquite thicket Alliance




*Prosopis glandulosa* occurs here along the northern edges of Palen Dry Lake in varying cover.

The photo displays a *Prosopis glandulosa* occupying a sandy fringe along the Mojave River.

***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.

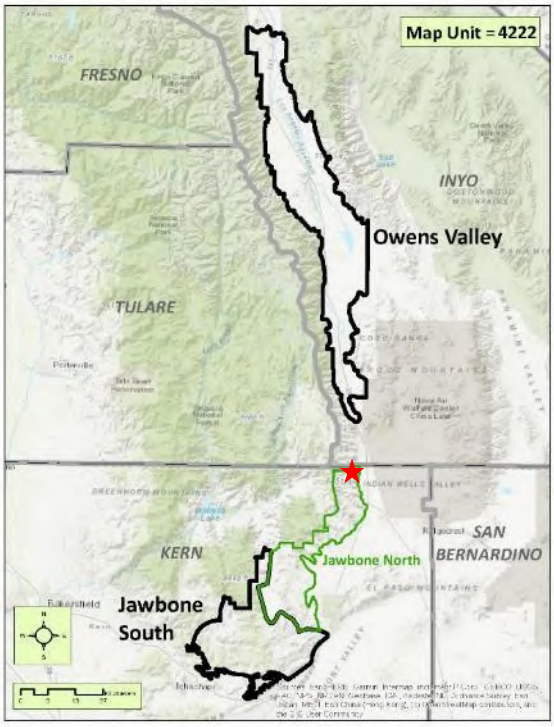
Note: There is a criteria change from previous DRECP mapping where cover of *Prosopis* was defined as greater than 3 percent. (Menke et al., 2013).

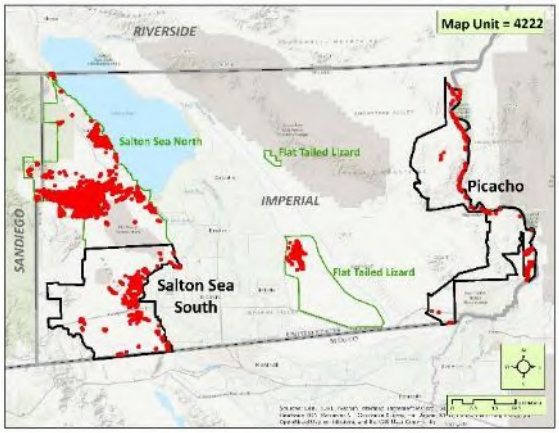
**PHOTOINTERPRETATION SIGNATURE:** Stands range in cover from sparse to moderately dense, with the small trees appearing bluish gray to dark green in color. Some stands with heavy die-off can appear light gray to dark gray in color with very little green signature. The tree crown is rounded with a well-defined 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. *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)**



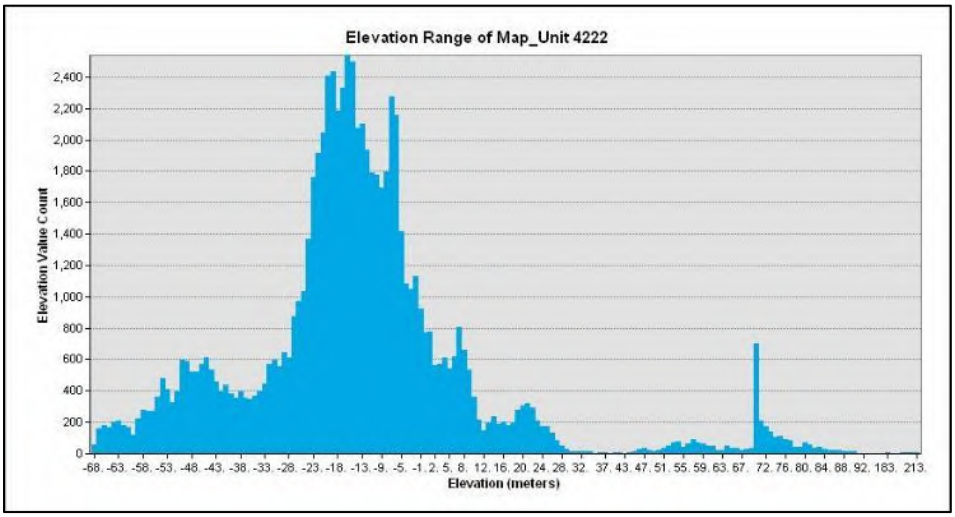




**DISTRIBUTION:** Stands of this Alliance are found along the margins of several dry lakes in the Mojave and Colorado Deserts. Stands also occur near and along the Colorado River floodplain, are common along the Mojave River, and to the south along both sides of the Salton Sea Trough. In the current study area, *Prosopis* is mapped through most of the Salton Sea North and South subareas, especially in the San Felipe Creek watershed of West Mesa and Lower Borrego Valley and in the fans and terraces along the west side of the Salton Sea Trough. Another extensive area is mapped in the sand dunes in the vicinity of Deer Peak in the Imperial Dunes Recreation Lands of the Flat-Tailed Horned Lizard subarea. *Prosopis* is also mapped along the Colorado River floodplain in the Picacho subarea with isolated stand in the Chocolate Mountains southwest of Arrowwood Springs, and on Pilot Knob Mesa south of Interstate 8. Additionally, one stand (represented as a star) was mapped in Sand Canyon in the Jawbone North subarea.

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

**Due to small aerial extent no Elevation Range Chart is provided**

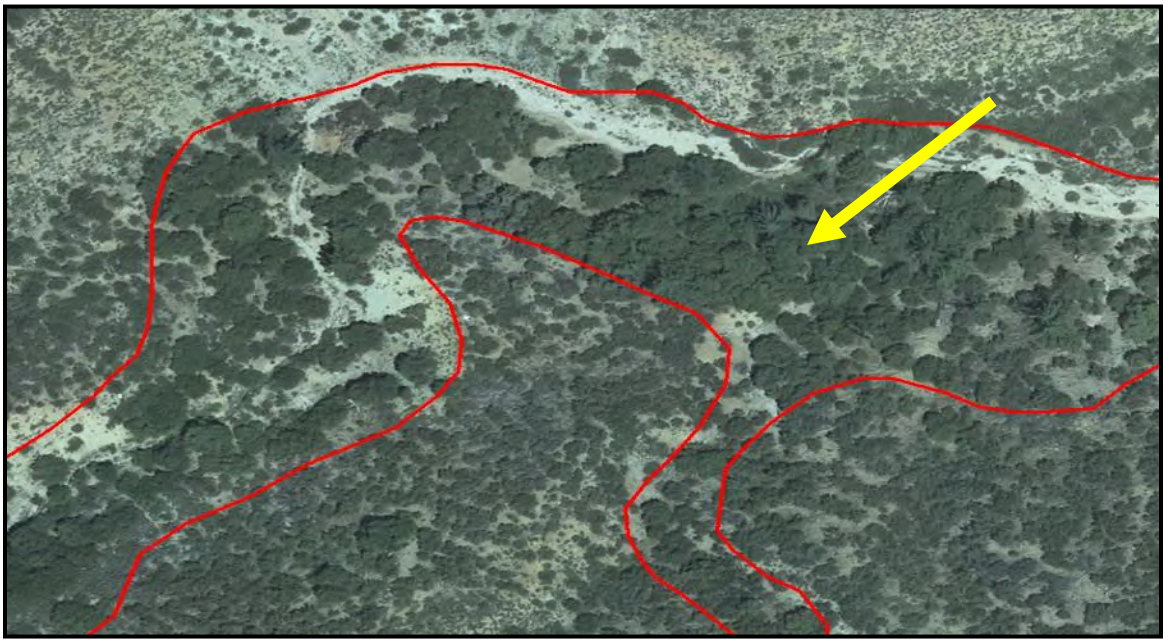
North subareas




South subareas

## *Quercus chrysolepis* Alliance (1113)

Canyon live oak forest Alliance



*Quercus chrysolepis* is depicted here in steep canyon terrain above 4500 feet (1370 meters) in moderate to dense cover with sparse emergent *Pseudotsuga macrocarpa*.

This photo depicts a *Quercus chrysolepis* stand on a steep and rocky north-trending slope where cover averages around 20 percent. Sparse *Pinus monophylla* is scattered throughout the stand and is especially noticeable on this photo along the upper ridgelines.

***Quercus chrysolepis* Alliance (1113)**

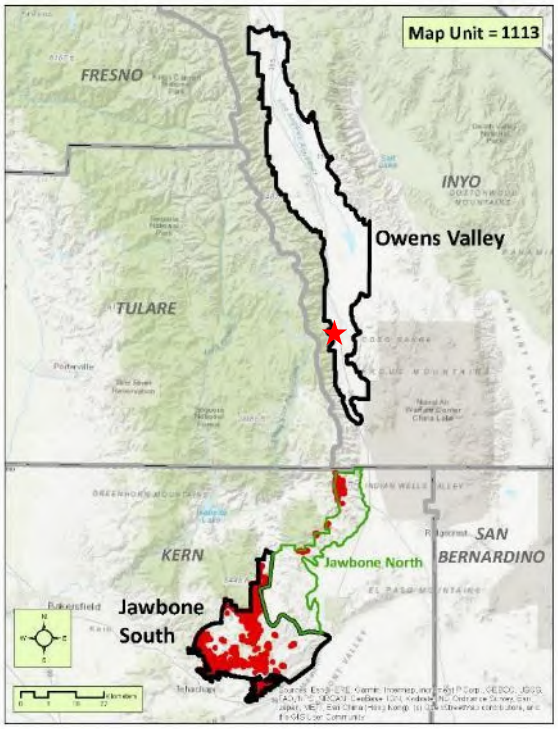
**DESCRIPTION:** In this Alliance *Quercus chrysolepis* is dominant to co-dominant in the tree overstory. If co-occurring with other oaks (*Q. lobata, Q. kelloggii,* or *Q. wislizeni*), *Q. chrysolepis* must be at least 30 percent cover. If co-occurring with *Pinus monophylla* or *Pinus jeffreyi, Q. chrysolepis* must be more than 60 percent relative cover. When *Pseudotsuga macrocarpa* or one/both of the other pines are co-dominant to dominant, then the respective conifer is the Alliance type. In the DRECP, stands of this Alliance occur along the Transverse Ranges and in the foothills and interior of the southern Sierra Nevada, in canyons, and on generally steep north-facing or concave exposures.

**PHOTOINTERPRETATION SIGNATURE:** *Quercus chrysolepis* can easily be recognized in that it is the only live oak restricted to canyons over 4000 feet (1220 meters) in elevation. Stands usually occur in cover well over 40 percent, and therefore understory shrub or herbaceous vegetation is normally not visible on the imagery. Individual crowns are medium to large and generally rounded in shape. The crowns are quite dense, a characteristic typical of all live oaks. Due to the dense stand cover, individual crowns normally are not very distinct; however, stand edges form a sharp boundary from adjacent more xeric types which are usually more open and lower in height. Stand configuration is generally fairly long and narrow due to settings found primarily in canyon bottoms and side slopes. Overall stand color during most of the year is a medium to dark green; higher elevation stands have sparse emergent *Pseudotsuga macrocarpa,* which have more blue-green star-like crowns. *Q. chrysolepis* can be distinguished from *Q. kelloggii* using leaf-off imagery since *Q. kelloggii* is a deciduous oak, while *Q. chrysolepis* is a live oak.

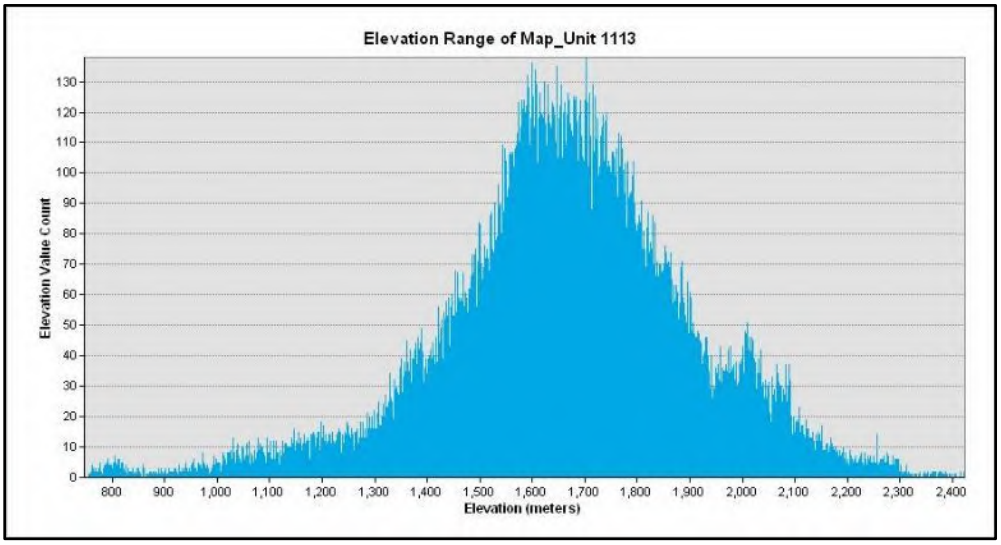
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Quercus kelloggii* Alliance (1118) – This species is easily distinguishable as a large deciduous oak co-dominating the stand with the live oak *Quercus chrysolepis.* In settings where the two co-dominate, the stand is classified to the *Quercus chrysolepis* Alliance.
- *Quercus wislizeni* Alliance (1114) – This type is found at slightly lower elevations, and in the mapping area is considered more of a shrub than an actual tree. Most stands of *Q. wislizeni* in the mapping area have also been burned within the last decade. *Q. wislizeni* also occurs in a mixed setting with other premontane chaparral species such as *Ceanothus leucodermis.*

***Quercus chrysolepis* Alliance (1113)**

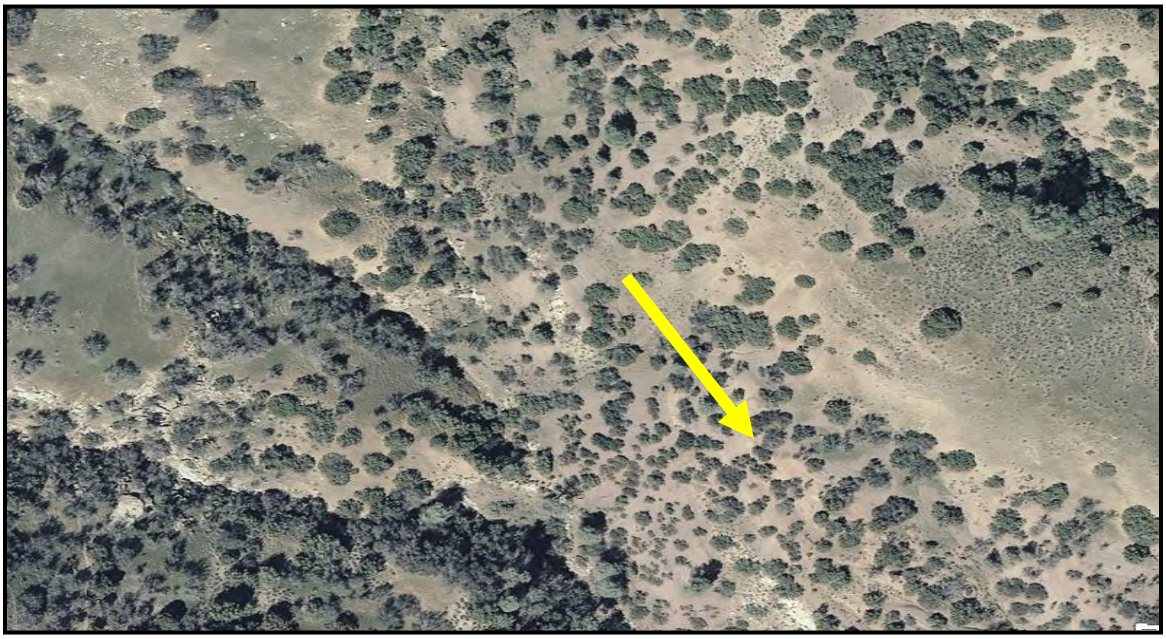



**DISTRIBUTION:** Small stands of *Quercus chrysolepis* occur in canyons and adjacent side slopes with seasonally or perennially flowing streams. Most stands are found above 4000 feet (1220 meters). In the current study area, *Q. chrysolepis* is mapped in the southern Sierra Nevada on the Piute Mountains, and the foothills to the southwest and southeast, as well as the upper foothills of the eastern Sierras, all within the Jawbone North and South, and Owens Valley subareas (Owens Valley stand(s) represented as a star).



## *Quercus douglasii* Alliance (1111)

Blue oak woodland Alliance



In this image, stands of *Quercus douglasii* occur on variable slopes with *Pinus sabiniana* as a sparse emergent on more mesic north-trending slopes. Note: this screenshot is a portion of a larger polygon whose boundaries are not shown.

This ground shot depicts a north-trending nearly pure stand of *Quercus douglasii* woodland.

***Quercus douglasii* Alliance (1111)**

**DESCRIPTION:** In this Alliance *Quercus douglasii,* or the hybrid, *Q. x alvordiana* is usually dominant to co-dominant in the tree layer. If mixed with *Q. lobata* or *Q. chrysolepis*, *Q. douglasii* must be more than 60 percent relative cover. However, when mixed with *Quercus wislizeni, Aesculus californica, Pinus sabiniana or Juniperus californica, Q. douglasii* must have greater than 30% cover. If the hybrid is tree-like in form it is mapped to this Alliance, if shrub-like then mapped to the *Quercus john-tuckeri* Alliance. Generally the Alliance is only found in the extreme westernmost portions of the DRECP, in the Tehachapi Mountains near Gorman, as well as the southernmost Sierra Nevada. Stands occasionally mix with *Juniperus californica* and/or *Q. john-tuckeri* along with emergent *Pinus sabiniana,* at times with a mixture of transmontane and cismontane shrubs and herbs in the understory. Stands occur on a variety of slope features; denser woodlands with emergent *Pinus sabiniana* are more frequently found on more mesic north-trending slopes.

Note: There is a criteria change from previous DRECP mapping where co-dominance of *Q. douglasii* with *P. sabiniana* or *J. californica* were mapped as those Alliances respectively (Menke et al., 2013).

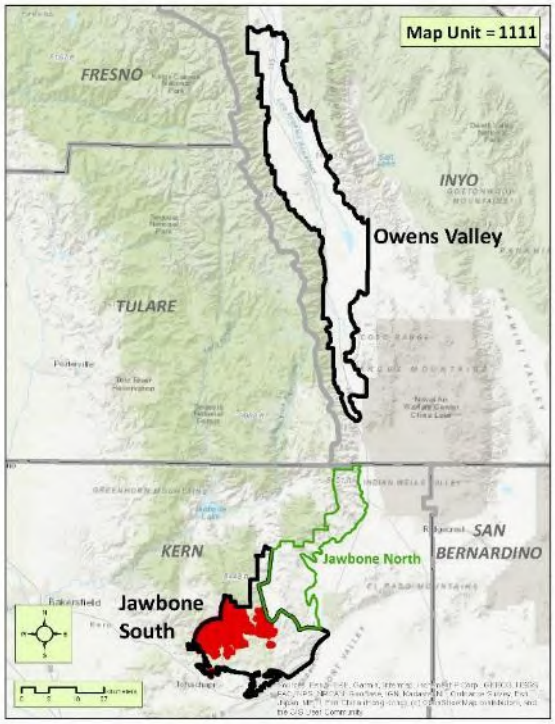
**PHOTOINTERPRETATION SIGNATURE:** Characteristic of the *Quercus douglasii* woodland is the presence of understory annual grasses in an open woodland setting. Canopy cover is generally below 30 percent, which characterizes this Alliance throughout the state. Individual crowns tend to be rather open, and fine-scale early season imagery allows the viewing of understory grasses and forbs. Crowns are medium-sized and rounded to slightly irregular in shape. On late summer imagery, stands portray a characteristically blue-green to blue-gray color. Emergent *Pinus sabiniana* is visible in some stands as a smaller, somewhat light gray, more irregularly shaped crown contrasting in color with the adjacent blue oak.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

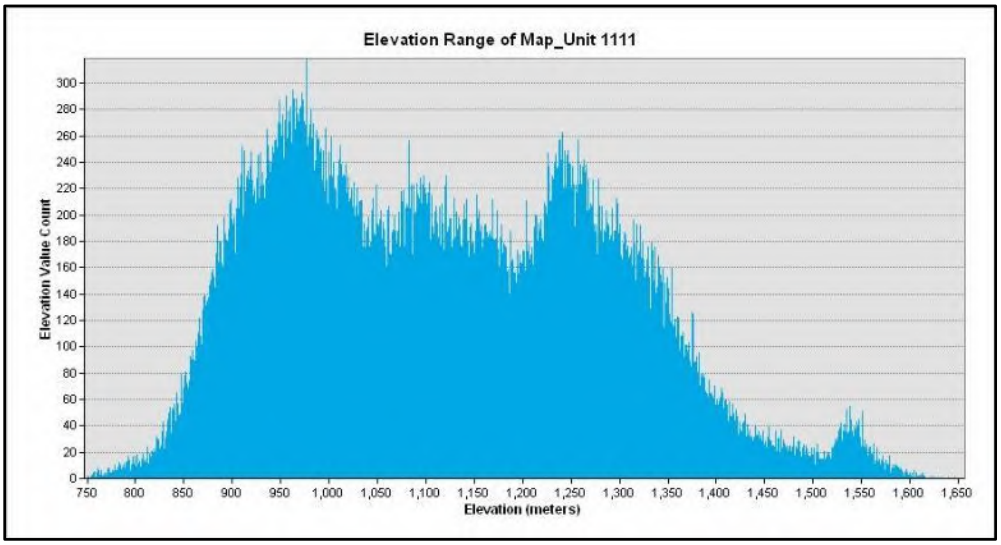
- *Quercus lobata* Alliance (1112) – This Alliance is generally found on deeper soils in valley bottoms and adjacent lower slopes. Crowns as a whole are significantly larger and more open, spreading broadly closer to the base with more clustering of branches throughout. Overall stand colors trend greener on late summer imagery, and decline of leaf vigor is less evident in the late dry season. Understory characteristics (primarily grasses and forbs) are similar to those of *Quercus douglasii* woodlands but tend to stay greener longer into the summer season.
- *Quercus wislizeni* Alliance (1114) – Stands generally occur on steeper, more protected lower to mid slopes, usually trending northerly with denser cover, often in post burn settings with other species of mesic chaparral. Crowns tend to be smaller, denser and have more distinct edges except in post burn settings where crowning becomes less distinct. Overall signature color is significantly greener. Image texture appearances across the stand are smoother, especially in post burn settings.

- *Quercus john-tuckeri* Alliance (3312) – Stands in the southern Sierra Nevada and Tehachapi Mountains tend to hybridize. For mapping purposes, the stand is assigned to the *Q. john-tuckeri* Alliance when the structural characteristics of the vegetation appear more shrub-like. Individual crowns are usually smaller, and branching within the crown is denser. Stands where the two species occur nearby can be distinguished by the usually denser cover (often over 40 percent) and lower stature of *Q. john-tuckeri* and lack of emergent *Pinus sabiniana*. Stands of *Q. john-tuckeri* often have a component of *Juniperus californica* showing up as a distinctly greener signature. *Q. john-tuckeri* tends to occur on steeper slopes.

***Quercus douglasii* Alliance (1111)**



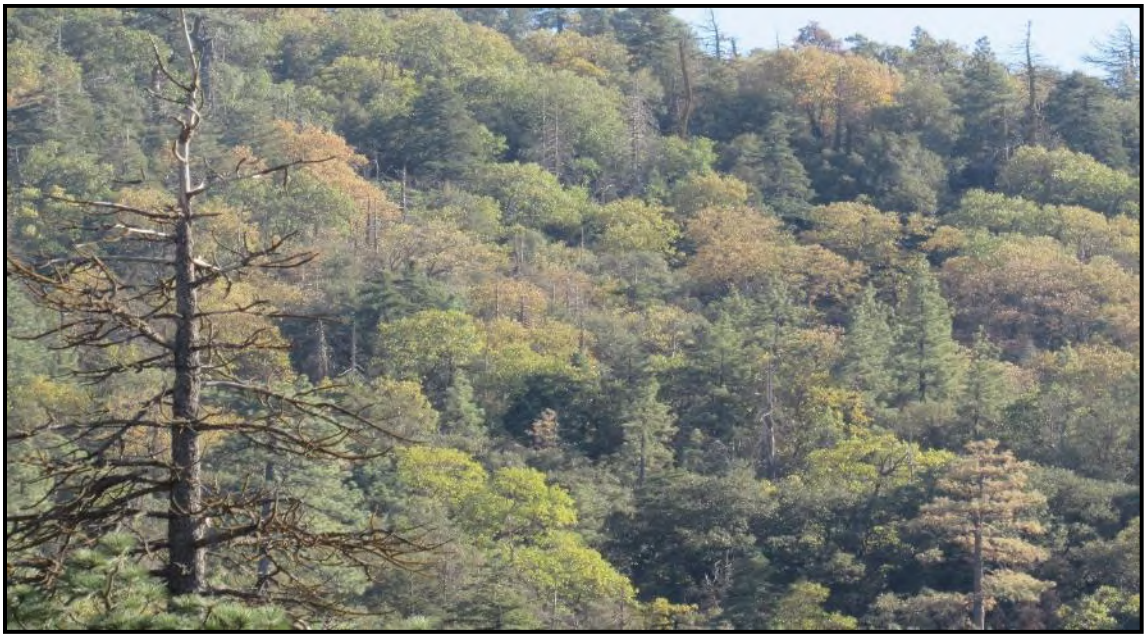

**DISTRIBUTION:** This Alliance is limited to the western portions of the DRECP. In the current study area, it is found primarily in the southern Sierra Nevada southeast and southwest of the Piute Mountains, within the Jawbone South subarea.



## Quercus kelloggii Alliance (1118)

California black oak forest Alliance

This example depicts a fuzzy crowned edge of dark green *Quercus kelloggii* strongly dominating the stand with scattered *Pinus jeffreyi* emergent over a grassy understory.



The above photo shows *Quercus kelloggii* leaves beginning to senesce, scattered with living and dying *Pinus jeffreyi* and *Abies concolor*.

***Quercus kelloggii* Alliance (1118)**

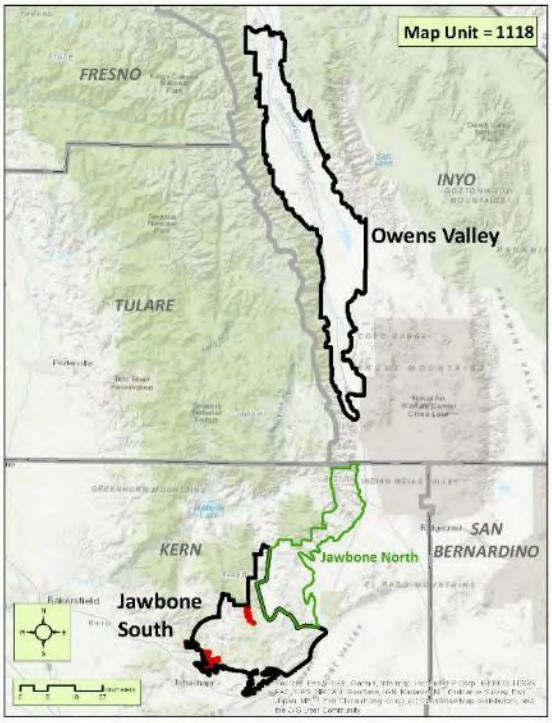
**DESCRIPTION:** In this Alliance *Quercus kelloggii* is dominant to co-dominant in the tree overstory If *Q. kelloggii* is co-dominant with *Quercus chrysolepis* or *Pinus jeffreyi*, then it is mapped to those Alliances respectively. In the DRECP, it is only found along mid- to upper-elevations of the southern Sierra Nevada.

**PHOTOINTERPRETATION SIGNATURE:** Stands are easily recognizable due to leaf loss in the late fall to winter months. With leaf-on imagery *Q. kelloggii* appears as a large, medium to dark green tree with rounded shape and a dense fuzzy crown texture. As the leaves senesce the color lightens to yellow-brown. *Q. kelloggii* is generally found as strongly dominant or as a co-dominant, usually with *Quercus chrysolepis*, or with *Pinus jeffreyi* in which case it is mapped to those Alliances.

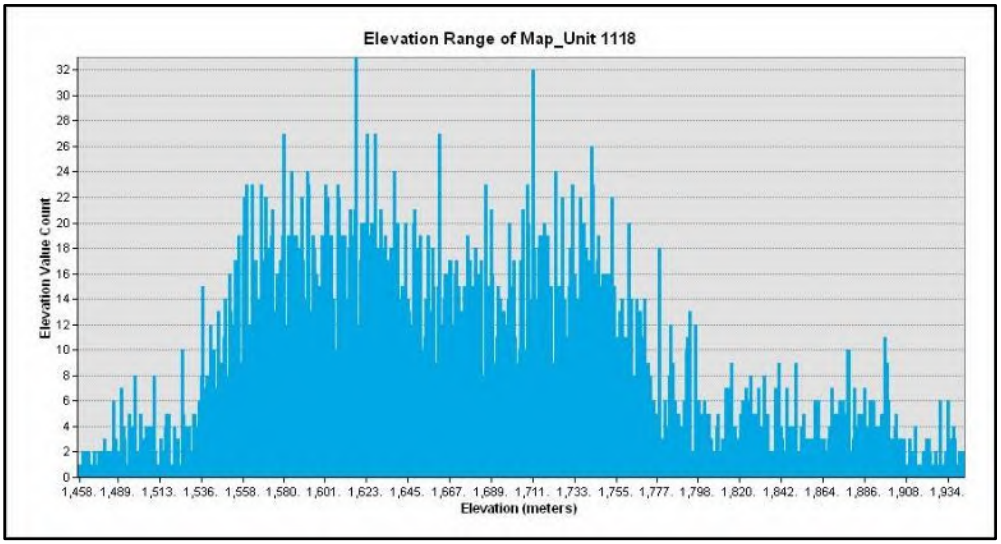
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Quercus chrysolepis* Alliance (1113) – This species is easily distinguishable as a large evergreen oak co-dominating the stand with the leaf-off *Quercus kelloggii.* In settings where the two co-dominate, the stand is classified to the *Quercus chrysolepis* Alliance.
- *Quercus douglasii* Alliance (1111) – This deciduous oak typically does not mix with *Q. kelloggii*, but can occur in close proximity in a small transitional area in the Piute Mountains between 4500-5000′ elevation. Both have a very similar signature on leaf-off imagery and prefer gradually sloping grassy convexities. Elevation and tree height are primarily used to differentiate between the two, with *Q. kelloggii* occurring higher in elevation (above 4500 feet) and displaying a larger crown size than *Q. douglasii*. Color-infrared imagery is also used to identify the brighter red signature of *Q. kelloggii* crowns compared to a duller, more muted red color for *Q. douglasii*.

***Quercus kelloggii* Alliance (1118)**

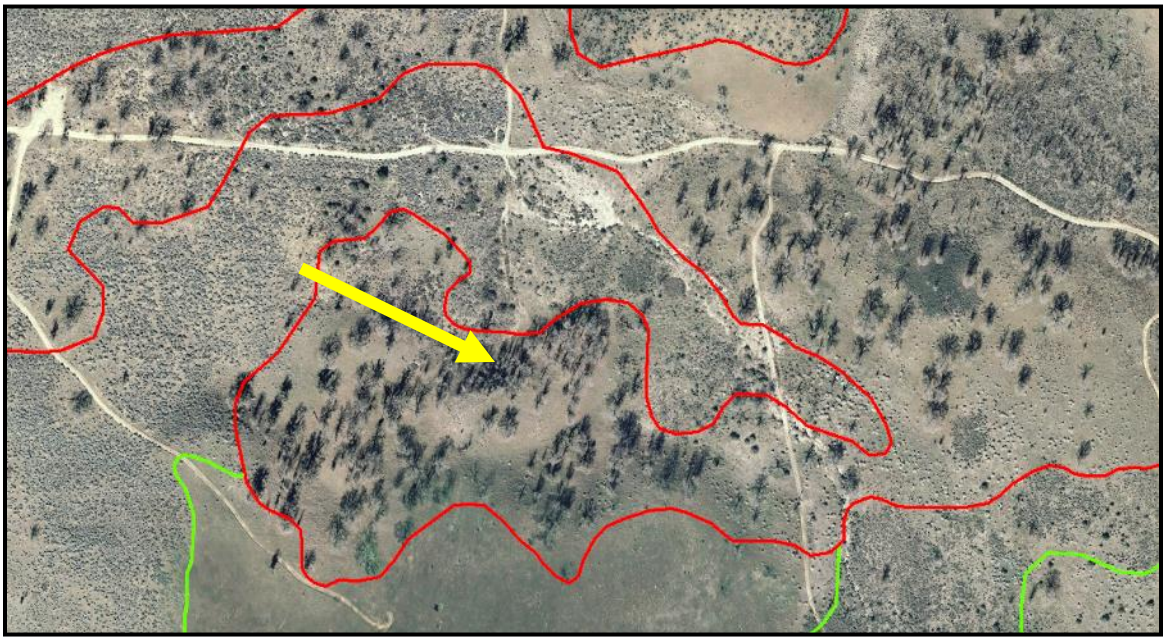



**DISTRIBUTION:** *Quercus kelloggii* Alliance is found at the western edge of the DRECP area. In the current study area, it is mapped in the interior Southern Sierra Nevada of the Jawbone South subarea, on the Piute Mountains and in the foothills to the southwest.



## *Quercus lobata* Alliance (1112)

Valley oak woodland Alliance



The example here depicts a stand of *Quercus lobata* in leaf-off conditions. This stand occurs in an open setting with a sparse shrub layer of *Ericameria nauseosa* over an understory of mixed grasses and forbs.

Example photo depicts a small stand of *Quercus lobata* on deep soil.

***Quercus lobata* Alliance (1112)**

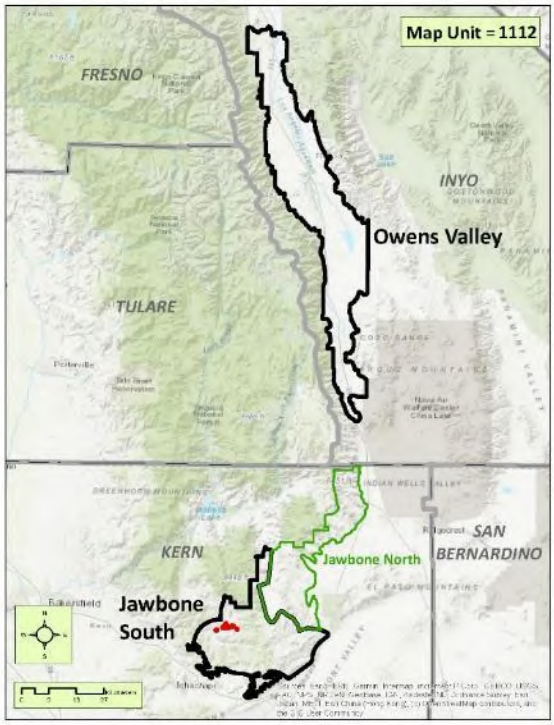
**DESCRIPTION:** *Quercus lobata* is dominant to co-dominant in this Alliance. *Q. lobata* may mix with *Q. douglasii*, *Q. wislizeni*, *Q. chrysolepis*, or *Pinus sabiniana*, but must be least 30 percent relative cover in the canopy. Stands generally occur in deep, relatively mesic soils where they are scattered on rather level lower slopes and valley bottoms. For the DRECP, the Alliance is only found in the in the Twin Oaks area of the southern Sierra Nevada, at the base of Liebre Mountain, and in the extreme westernmost Tehachapi Mountains near Gorman.

**PHOTOINTERPRETATION SIGNATURE:** *Quercus lobata* occurs in open to very open woodland settings generally below 30 percent cover except in small protected coves, where cover can be quite dense. Individual crowns are very large and irregularly shaped. Branching from the main stem extends broadly and begins significantly closer to the base of the tree than in other oaks. Crown top branching tends to coalesce, forming small tight clusters within the upper reaches of the canopy. Cover across the stand tends to be highly variable in both distribution and tree size. Leaf-off imagery tends to depict tree crowning with indistinct edges and significant shadowing. Leaf vigor declines minimally in the summer months, yielding a fairly bright, green to light-green color across the stand when viewing leaf-on imagery.

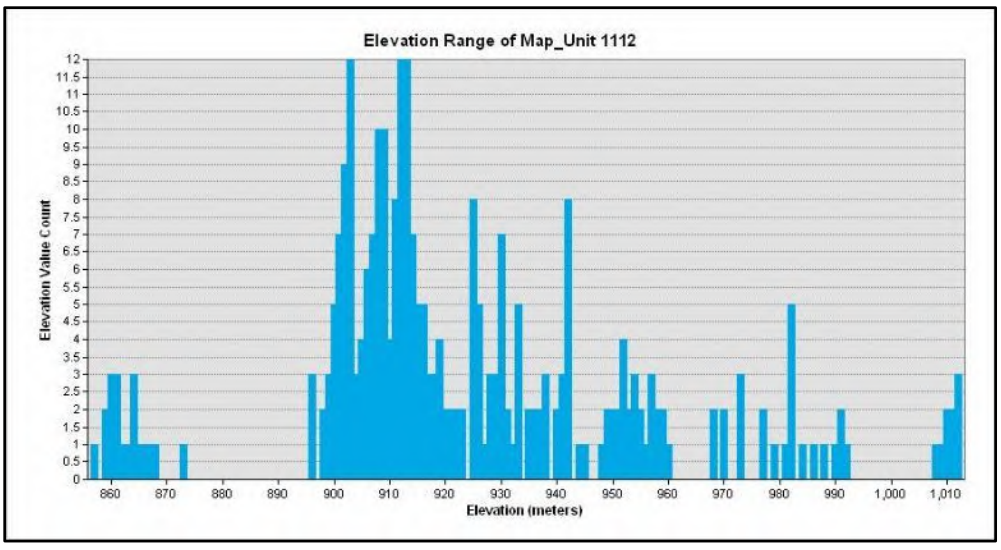
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Populus fremontii – Fraxinus velutina – Salix gooddingii* Alliance (1411) – Small stands occurring near valley oak woodlands typically occur in a more linear riparian setting. Overall cover is more variable across the stand but generally trends higher. Leaf-off imagery usually depicts the main and larger auxiliary branches with a significantly lighter color. Crowns are similar in size but tend to vary more between individuals; larger trees often contain a significant dead component. Mid-to-late season leaf-on imagery tends to yield a lighter green color.
- *Quercus douglasii* Alliance (1111) – Stands are generally found on shallower soils in more xeric settings on somewhat steeper slopes. Crowns average smaller and slightly more rounded in shape, with more upward branching giving the overall tree a less complex shape. Early to mid-summer leaf-on imagery depicts *Q. douglasii* generally with more of a blue-green tint to the crown due to the onset of drought-related stress characteristics to the leaf.

***Quercus lobata* Alliance (1112)**




**DISTRIBUTION:** The range of the *Quercus lobata* Alliance is similar to that of *Quercus douglasii*. In the current study area, it is even more restricted to the larger canyons of the southern Sierra Nevada southwest of the Piute Mountains within the Jawbone South subarea.



## *Quercus wislizeni* Alliance (1114)

Interior live oak woodland Alliance

In this stand, *Quercus wislizeni* shares dominance with other premontane chaparral species including *Ceanothus leucodermis* and *Aesculus californica.* Much of the dense cover in this example occurs on steep terrain in a post burn setting. Note: this screenshot is a portion of a larger polygon whose boundaries are not shown.

This photo depicts a stand burned in 2004. Recovering species include *Quercus wislizeni, Ceanothus leucodermis* and *Aesculus californica.*

***Quercus wislizeni* Alliance (1114)**

**DESCRIPTION:** In this Alliance *Quercus wislizeni* is dominant or co-dominant at more than 30 percent relative cover, with other tree species in the overstory. *Q. douglasii* and *Q. chrysolepis*, if present, occur at low cover (generally less than 30 percent relative canopy cover). Stands are limited to the lower north-facing slopes, in low valleys, or on terraces adjacent to true riparian woodlands. Many have been recently burned and are scrubby. *Quercus wislizeni* ssp. *frutescens* (which would key in the premontane chaparral Group) has been identified in the southern Sierra Nevada, and is mapped as this Alliance. In the DRECP, stands of *Quercus wislizeni* Alliance occur along the Transverse Ranges, along the eastern Sierra Nevada desert foothills, and in the foothills and interior of the southern Sierra Nevada.

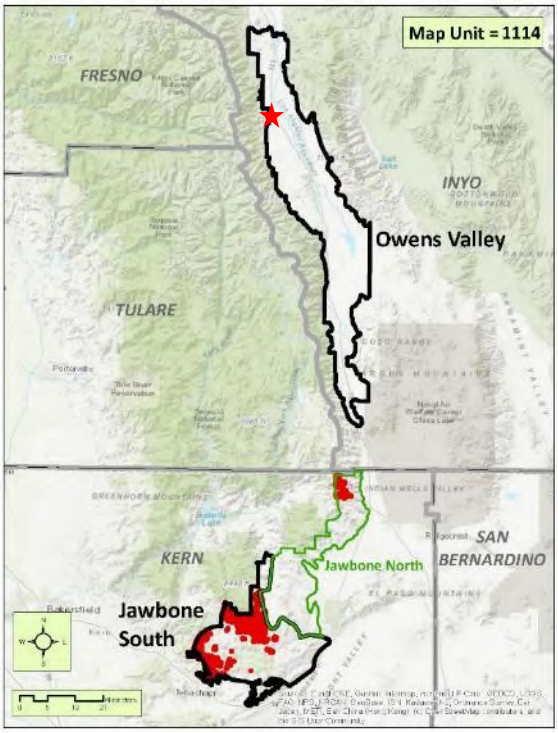
Note: There is a criteria change from previous DRECP mapping where co-dominance of *Q. wislizeni* with *P. sabiniana* or *J. californica* were mapped as those Alliances respectively (Menke et al., 2013).

**PHOTOINTERPRETATION SIGNATURE:** Stands are generally more shrub-like since most have undergone recent fire disturbance. Cover is usually very dense and recognizable by the dark green but variable color occurring throughout most of the stand. Stand color variability is due in part to other chaparral species co-dominating portions of the stand and the amount of dead vegetation present. Stand margins are often difficult to distinguish since they are often adjacent to other post burn chaparral types found in more xeric settings such as *Quercus john-tuckeri* and *Adenostoma fasciculatum.*

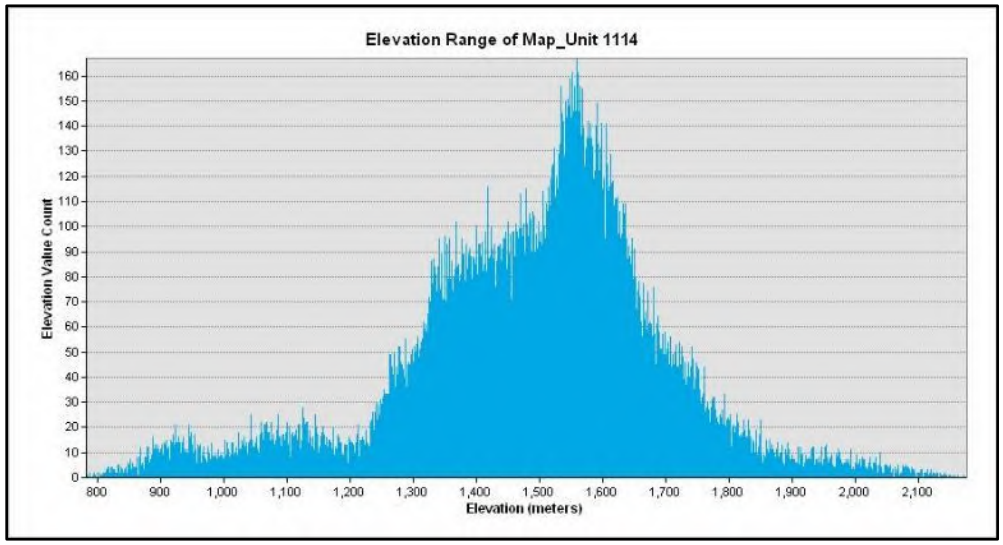
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Quercus chrysolepis* Alliance (1113) – This species is more tree-like with a taller crown. Individual crowns are more distinct even in dense cover, and brighter green in color. Stands generally occur at higher elevations on more protected slopes.
- *Quercus john-tuckeri* Alliance (3312) – This type is generally found in more of an open cover setting, often with a presence of *Juniperus californica* giving the stand a contrasting brighter green signature against a more brownish-green overall color. However, where *Q. wislizeni* dies back it exhibits a dull gray color within portions of the canopy which can appear similar to the *Q. john-tuckeri* signature. Stands generally occur closer to the desert margins and occasionally have *Yucca brevifolia* in the canopy.

***Quercus wislizeni* Alliance (1114)**




**DISTRIBUTION:** Stands of *Quercus wislizeni* occur at the western edge of the DRECP. In the current study area, *Quercus wislizeni* is mapped on the mid to lower slopes of the Piute Mountains and, the interior of the southern Sierra Nevada of the Jawbone South subarea; and in the upper foothills of the eastern Sierras of the Jawbone North subarea; and along Oak Creek in Owens Valley, within the Owens Valley subarea, which is represented as a star.



## *Salix gooddingii – Salix laevigata* Alliance (1416)

Black willow – Red willow thickets Alliance

This image depicts a *Salix laevigata*-dominated stand with a minor component of *Populus fremontii*.

*Salix laevigata* dominates the tree canopy in the foreground with some shrubby *Salix exigua.* Taller *Populus fremontii* occurs behind the stand toward the left side of the photo.

***Salix gooddingii – Salix laevigata* Alliance (1416)**

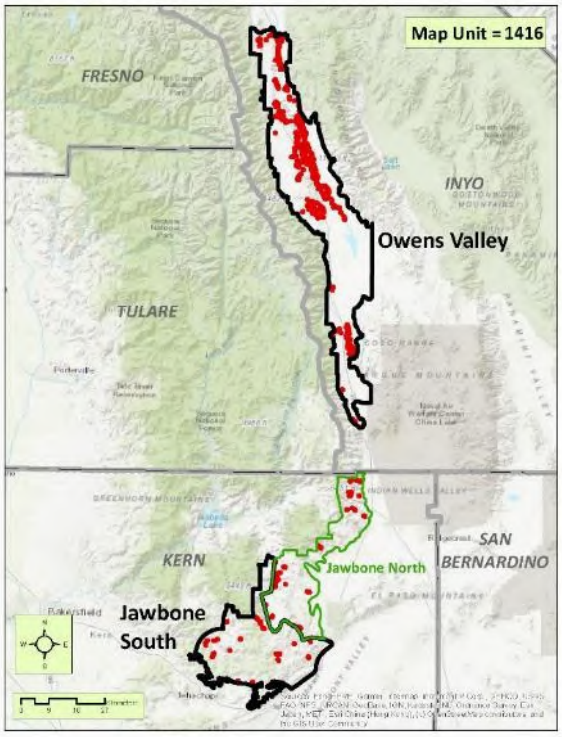
**DESCRIPTION:** In this Alliance *Salix laevigata* and/or *Salix gooddingii* dominate to strongly dominate the overstory layer with at least 10 percent cover. *Salix lasiolepis* may occur as a sub- or co-dominant in the shrub or low tree layer. Other willow species may occur in the canopy but in lower cover. *Populus fremontii* and *Platanus racemosa* are less than 5 percent absolute cover, and neither dominate the stand, otherwise they would be mapped to their respective alliances. This Alliance usually occurs in small stands associated with isolated springs, seeps, and permanent wet areas in the Antelope and Owens Valleys, and locally along the Mojave, Owens, and Colorado Rivers, and some creeks in the southern Sierra Nevada. Stands may be associated with *P. fremontii* or shrubby riparian stands of *Forestiera pubescens, S. exigua,* etc. Stands also tend to colonize reservoir margins and small dammed ponds.

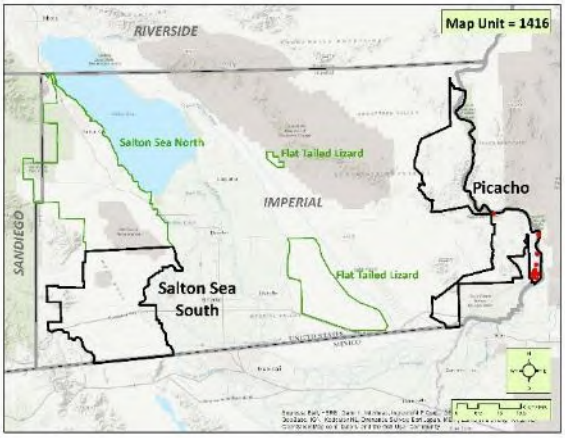
**PHOTOINTERPRETATION SIGNATURE:** Stands occur in open to dense patches along riparian corridors, mainly in the non-desert portions of the study area. Trees in mature stands have multiple crowning from the main stem and tend to have a light to medium bright green color. Young stands may be much shorter in stature and have more of an even, smoother texture.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Platanus racemosa* Alliance (1414) – Trees within stands dominated by *Platanus racemosa* tend to have a significantly less green appearance due to early-season leaf stress. Crowns are poorly defined and cover is generally lower. Stands tend to be isolated in very narrow canyons.
- *Populus fremontii – Fraxinus velutina – Salix gooddingii* Alliance (1411) – *Populus fremontii* tends to have larger, more open crowns and overall has a darker green color. *Populus* and *Salix* species often occur together in a stand; in these settings, photointerpreters mapped to the *Populus fremontii – Fraxinus velutina – Salix gooddingii* Alliance. Stands are more likely to occur out of narrow canyons on broader floodplains. *Salix laevigata* and *Salix gooddingii* associate with more permanent surface water than *Populus fremontii.*
- *Salix lasiolepis* Alliance (1427) – Stands dominated by this willow species are generally not separable from immature stands of *Salix laevigata* because of structural unevenness due to vegetation age inconsistency within the stand. In older stands, overall height is generally more uniform throughout, resulting in a smoother texture to the signature.

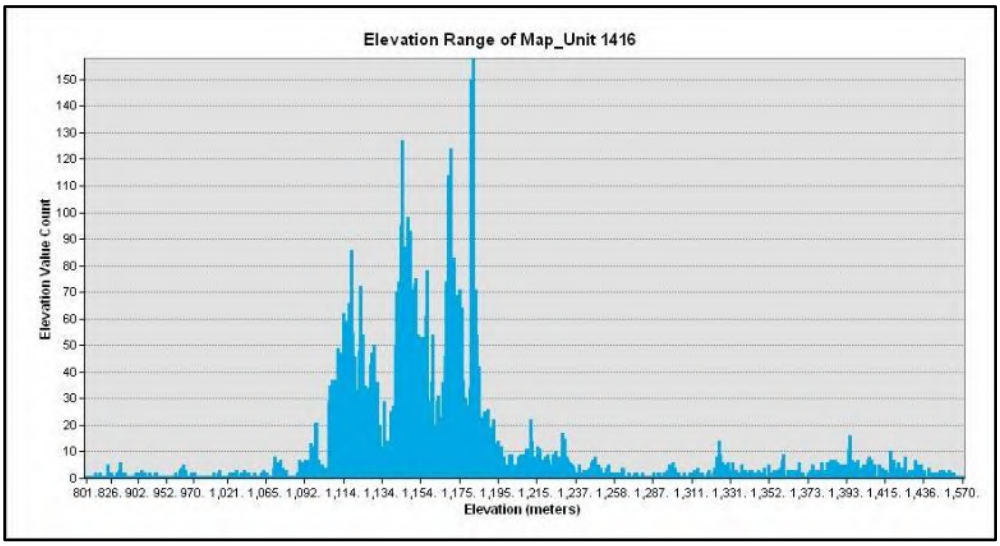
***Salix gooddingii – Salix laevigata* Alliance (1416)**



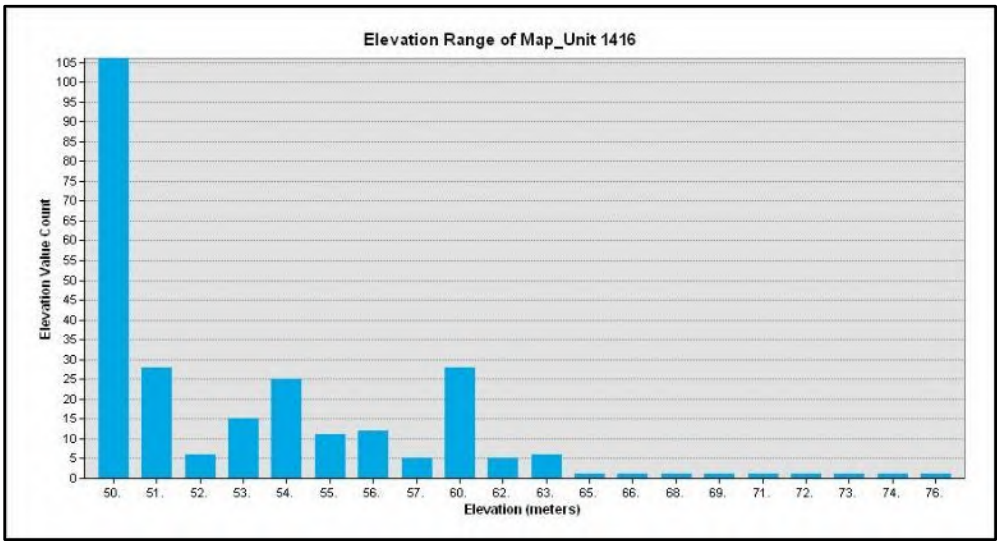




**DISTRIBUTION:** The majority of mapped stands are scattered along springs, dammed lakes and/or major drainages flowing out of the mountains at the westernmost edge of the DRECP, and along the Mojave River. In the current study area, the Alliance is mapped on the Owens River floodplain and lower tributary streams of the Owens Valley subarea; in the interior and desert foothills of the southern Sierra Nevada in the Jawbone North and South subarea; and along the Colorado River floodplain in the Picacho subarea.

***Salix gooddingii – Salix laevigata* Alliance (1416)**



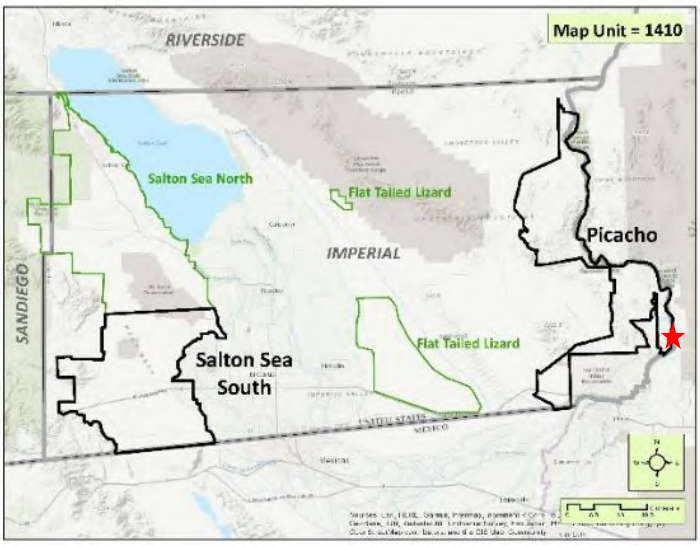

North subareas




South subareas

## Southwestern North American riparian evergreen and deciduous woodland Group (1410)

(Also known as the Great Basin montane riparian shrub Group, or the Western montane-subalpine riparian & seep shrubland Group)

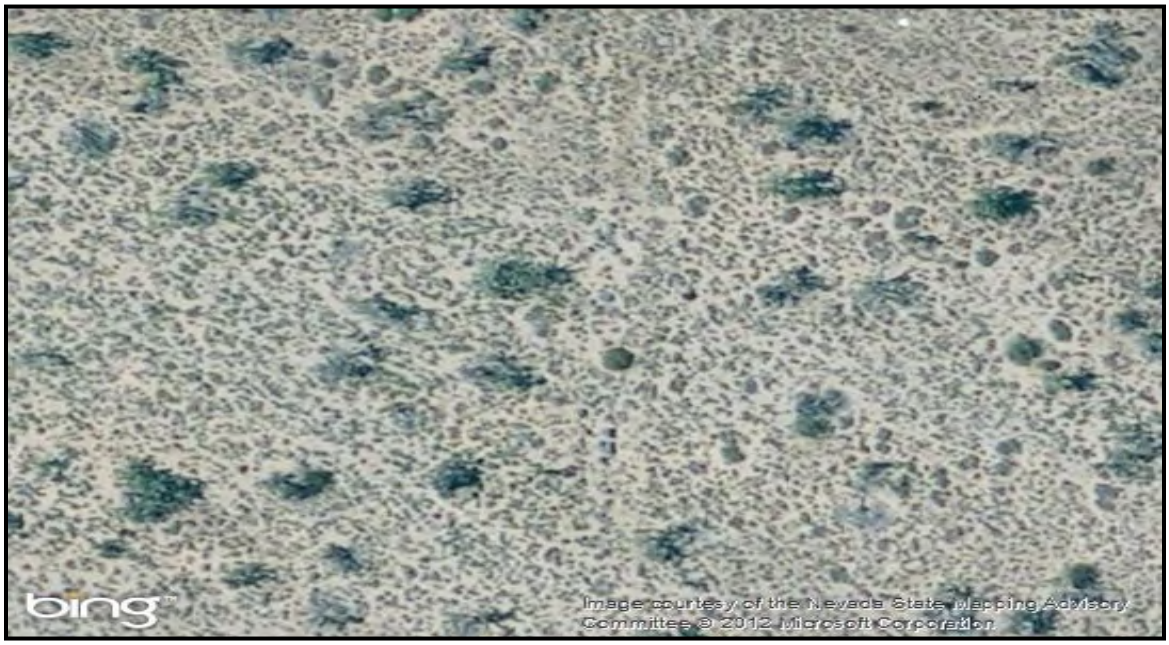



**DISTRIBUTION:** Stands of this Group were infrequently mapped in the Picacho subarea study area. These stands were mapped at the Group level because the Alliance was not discernible from the imagery. Eight polygons were mapped, none of which were verified or visited in the field. All of them occur in the southeasternmost portion of the subarea on the Colorado River floodplain northeast of Yuma (represented on the map as a star). Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.

**Due to small aerial extent no Elevation Range Chart is provided**

## *Yucca brevifolia* Alliance (5423)

Joshua tree woodland Alliance




In this example, *Yucca brevifolia* occurs as multiple-crowning individuals in cover between 3 and 5 percent over a mixed shrub layer comprised mostly of *Eriogonum fasciculatum.* Note: This screenshot is a portion of a larger polygon whose boundaries are not shown.

Emergent large multiple-crowned individuals of *Yucca brevifolia* are seen here over an inconsistent shrub cover of *Atriplex polycarpa.* Dense annuals (mainly *Bromus rubens*) form a distinct herbaceous layer in the foreground.

***Yucca brevifolia* Alliance (5423)**

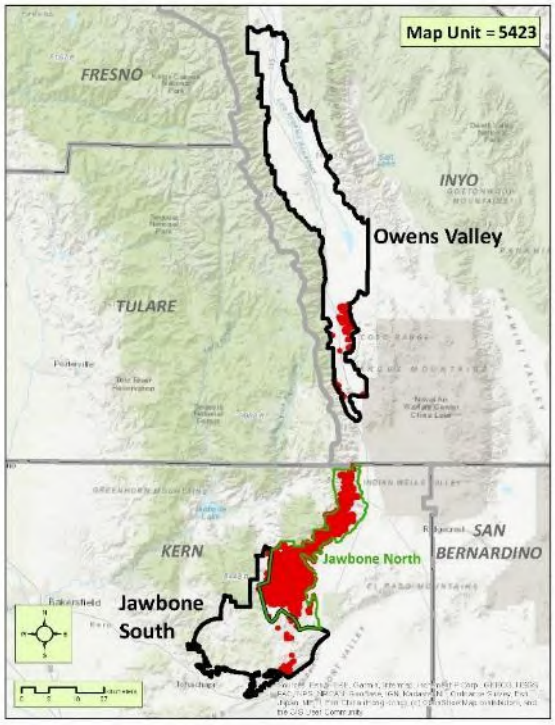
**DESCRIPTION:** *Yucca brevifolia* must be evenly distributed, not scattered and clumped, and must be at least 1 percent absolute cover to map a stand as this Alliance. Although they usually only comprise between 1 and 5 percent cover, the highest cover of *Y. brevifolia* may reach 10 percent in clonal stands in the western part of the Mojave Desert. Often, shorter shrubs or perennial grasses have substantially higher cover beneath the well-spaced emergent trees. Where *Y. brevifolia* and *Pinus monophylla* occur together, and *P. monophylla* is more than 1 percent absolute cover and evenly distributed, the stand is mapped as the *Pinus monophylla* Alliance. Where *Y. brevifolia* and *Juniperus californica* occur together, and *J. californica* is more than two times the cover of *Y. brevifolia*, the stand is mapped as the *Juniperus californica* Alliance. Sclerophyll shrubs such as *Fremontodendron californicum* and *Quercus john-tuckeri* must be less than 10% absolute cover.

**PHOTOINTERPRETATION SIGNATURE:** Stands are typically sparse in cover and can be comprised of individuals with single or multiple crowns. Crown shape, size and age may vary widely within a stand. The dull greenish gray individuals often produce shadowing that may appear linear from the base of the tree and is apparent on the image as a result of its single upright trunk and thick forking branches. Single-stem individuals below 3 meters tall are difficult to interpret even using high-resolution imagery.

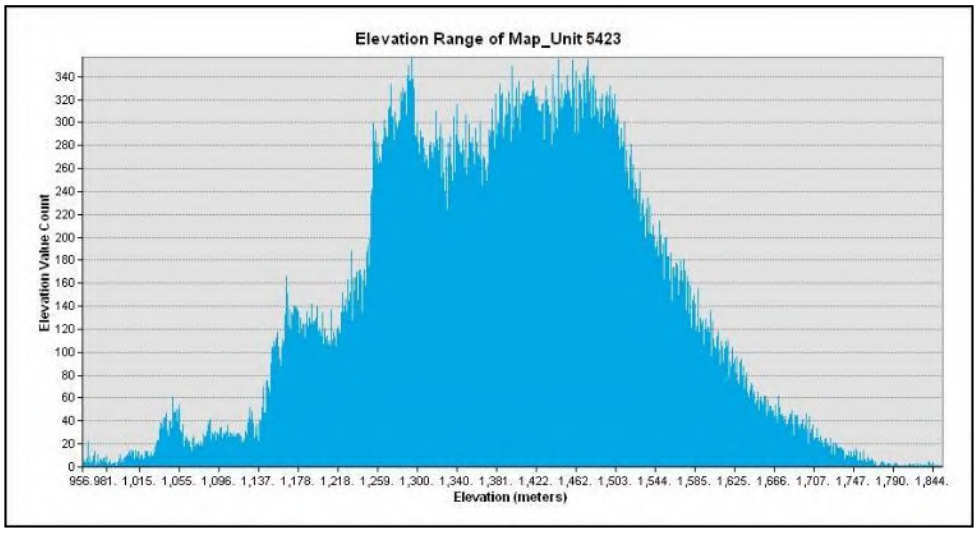
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Yucca schidigera* Alliance (5424) – Individuals are on average smaller in stature, with a single shadow accompanying its shorter main stem. *Y. schidigera* almost always occurs in areas where *Larrea tridentata* is present in the shrub layer. There is an approximate elevation overlap zone, roughly between 2700 - 3700 feet (820 – 1130 meters), where both *Yucca* species may co-occur. In these settings, *Y. brevifolia* is generally not as well developed, having shorter than normal stature and smaller crowns, making the distinction between the two types difficult. *Yucca schidigera* individuals are generally not found west of the Mojave River and north of Interstate 40.

***Yucca brevifolia* Alliance (5423)**




**DISTRIBUTION:** Stands are established along higher elevation fans and bajadas adjacent to the southern Sierra Nevada and Transverse Ranges, and as far east as the Little San Bernardino Mountains near Yucca Valley. Near Edwards Air Force Base, they extend into lower elevation areas that are associated with cold-air basins. Small outlier populations also occur on higher elevation fans within the Eastern Mojave and Central Mojave regions. In the current study area, In the Owens Valley subarea *Yucca brevifolia* is only mapped on the alluvial fans above Haiwee Reservoir and in the Rose Valley. It is mapped extensively throughout the desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas.



## Shrubs

*Acacia greggii – Hyptis emoryi – Justicia californica* Alliance (4226)
*Allenrolfea occidentalis* Alliance (3721)
*Ambrosia dumosa* Alliance (4111)
*Ambrosia salsola – Bebbia juncea* Alliance (7211)
    *Ambrosia salsola* Mapping Unit (formerly Alliance) (4216) – Salton Sea North and South
*Arctostaphylos glauca* Alliance (2111)
*Arctostaphylos viscida* Alliance (2117)
*Artemisia tridentata* Alliance (5311)
*Atriplex canescens* Alliance (5111)
*Atriplex confertifolia* Alliance (5112)
*Atriplex lentiformis* Alliance (3722)
*Atriplex polycarpa* Alliance (4113)
*Baccharis emoryi – Baccharis sergiloides* Alliance (1423)
*Baccharis salicifolia* Alliance (1422)
*Betula occidentalis* Alliance (1521)
*Castela emoryi* Special Stands – See *Ephedra californica – Ephedra trifurca* Alliance
*Ceanothus cordulatus – Ceanothus integerrimus* Alliance (3212)
*Ceanothus cuneatus* Alliance (2116)
*Ceanothus greggii – Fremontodendron californicum* Alliance (3316)
*Ceanothus oliganthus – Ceanothus leucodermis* Alliance (2123)
Central and south coastal California seral shrub Group (2210)
*Cercocarpus ledifolius* Alliance (5441)
*Cercocarpus montanus* Alliance (2131)
*Coleogyne ramosissima* Alliance (5421)
*Cornus sericea – Rosa woodsii – Ribes* spp. Alliance (1522)
*Cylindropuntia bigelovii* Alliance (4124)
*Encelia (actoni, virginensis) – Viguiera reticulata)* Alliance (5211)
*Encelia farinosa* Alliance (4114)
*Ephedra californica – Ephedra trifurca* Alliance (4211)
    *Castela emoryi* Special Stands (formerly Alliance) (4229) – Salton Sea South
*Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419)
*Ephedra viridis* Alliance (5417)
*Ericameria linearifolia – Cleome isomeris* Alliance (2214)
*Ericameria nauseosa* Alliance (5212)
*Ericameria nauseosa – Atriplex lentiformis* Mapping Unit (5217)
*Ericameria paniculatum* Alliance (4213)

*Ericameria teretifolia* Alliance (5416)
*Eriogonum fasciculatum* Alliance (cismontane) (2226)
*Eriogonum fasciculatum – Viguiera parishii* Alliance (2221)
*Eriogonum wrightii – Eriogonum heermannii – Buddleja utahensis* Alliance (2222)
*Rhus trilobata – Crataegus rivularis – Forestiera pubescens* Alliance (1425)
*Frangula californica* Alliance (3811)
*Isocoma acradenia* Association (formerly Alliance) – See *Suaeda moquinii – Isocoma acradenia* Alliance
*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)
*Parkinsonia microphylla* Provisional Alliance (4152)
*Pluchea sericea* Alliance (4221)
*Prunus fasciculata – Salazaria mexicana* Alliance (7212)
*Psorothamnus fremontii – Psorothamnus polydenius* Alliance (4219)
*Purshia tridentata – Artemisia tridentata* Alliance (5422)
*Quercus john-tuckeri* Alliance (3312)
*Quercus palmeri* Alliance (3313)
*Ribes quercetorum* Provisional Alliance (3211)
*Salix exigua* Alliance (1424)
*Salix lasiolepis* Alliance (1427)
*Sarcobatus vermiculatus* Alliance (5511)
Southwestern North American riparian/wash scrub Group (1420)
*Suaeda moquinii – Isocoma acradenia* Alliance (7411)
    *Isocoma acradenia* Association (formerly Alliance) (3728) – Salton Sea North, Salton Sea South, Flat-Tailed Horned Lizard
    *Suaeda moquinii* Mapping Unit (formerly Alliance) (3725) – Picacho, Salton Sea North, Salton Sea South
*Tamarix* spp. Semi-natural Stands (1432)
*Vitus arizonica – Vitus girdiana* Alliance (1428)

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

Catclaw acacia thorn – Desert lavender scrub Alliance

In this narrow wash channel, the larger rounded gray *Acacia greggii* dominates the shrub layer.

The wash in this photo is dominated by the wispy green *Acacia greggii* in the foreground mixed with the smaller tawny *Ambrosia salsola* in the background.

***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 *Ericameria paniculata, Krameria grayi* or *Ambrosia salsola* can have higher cover but no more than twice the cover of *Acacia greggii.* Stands of this Association 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 a 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 not in high cover within the stand may include *Acacia greggii, Larrea tridentata*, and *Sarcostemma hirtellum.* Stands of this Association 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 Jawbone South and Owens Valley subareas. Florisitic 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). The Salton Sea region, which includes Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.

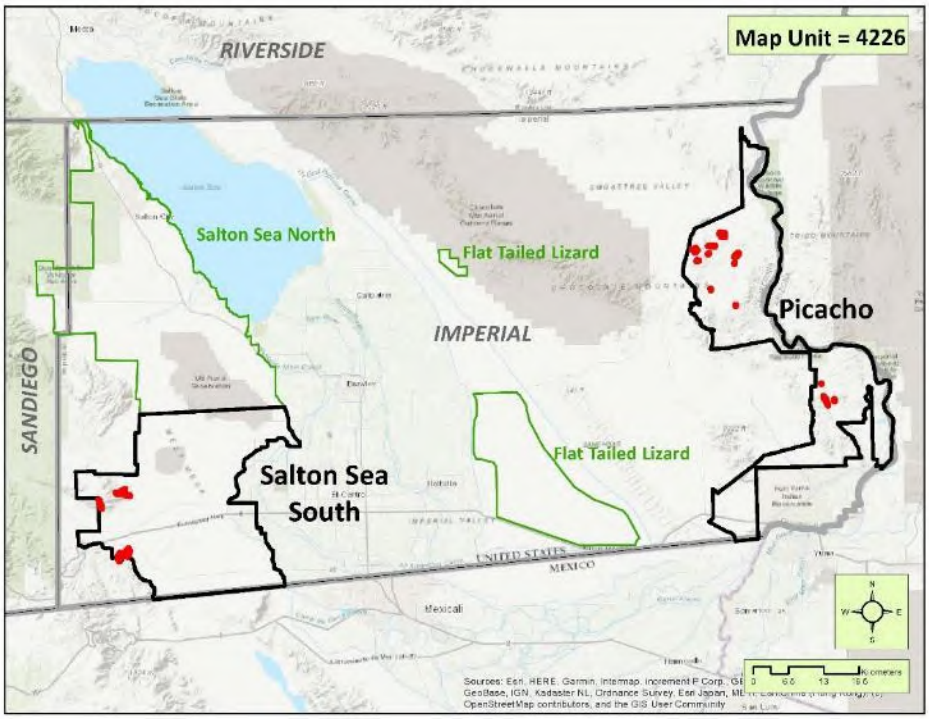
**PHOTOINTERPRETATION SIGNATURE:** *Acacia greggii* is a taller shrub species often forming irregularly shaped, small but distinct patches along the margins of active channels. Crowns tend to be dense with a dark gray or dark brown color, sometimes with a green tint. Stands can range from sparse to moderately 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.

**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. Many times the spreading upper branches of the small tree cast jagged shadows around the tree crown. Stands tend to occur in sparser cover.
- *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 this 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.
- *Prunus fasciculata – Salazaria mexicana* Alliance (7212) – *Prunus fasciculata* appears greener in color with more of a well-defined crown margin.

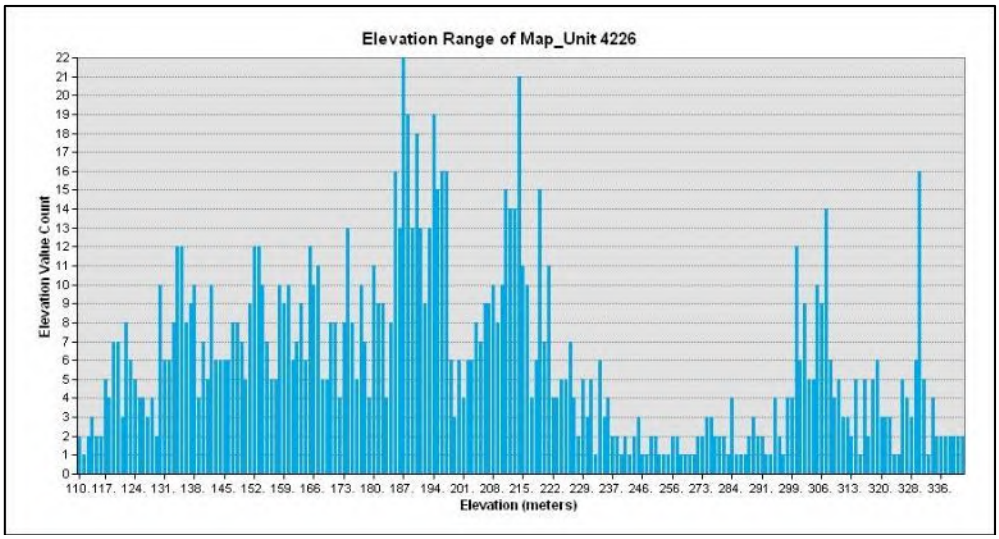
***Acacia greggii – Hyptis emoryi – Justicia californica* Alliance (4226)**




**DISTRIBUTION:** Stands of *Acacia greggii* are concentrated along the northern boundary of Joshua Tree National Park from Pioneertown eastward to past the Sheephole Mountains; southeast of Barstow from Stoddard Ridge east to Rodman Mountains down to the edge of Lucerne and Johnson Valleys; widespread and common in the Eastern Mojave Desert region; and fairly common at higher elevations in the Chuckwalla and Chocolate Mountains. A few disjunct stands occur Central Mojave Desert region and the along the Riverside Mountains. Mappable stands of the *Hyptis emoryi* occur in narrow upland canyons and alluvial fans east of Twentynine Palms along the northeastern fringe of Joshua Tree National Park. Stands are common in the Colorado Desert in small mountain washes and rivulets between desert pavement. Since most stands are significantly less than 10 meters wide, they are generally too narrow to map.

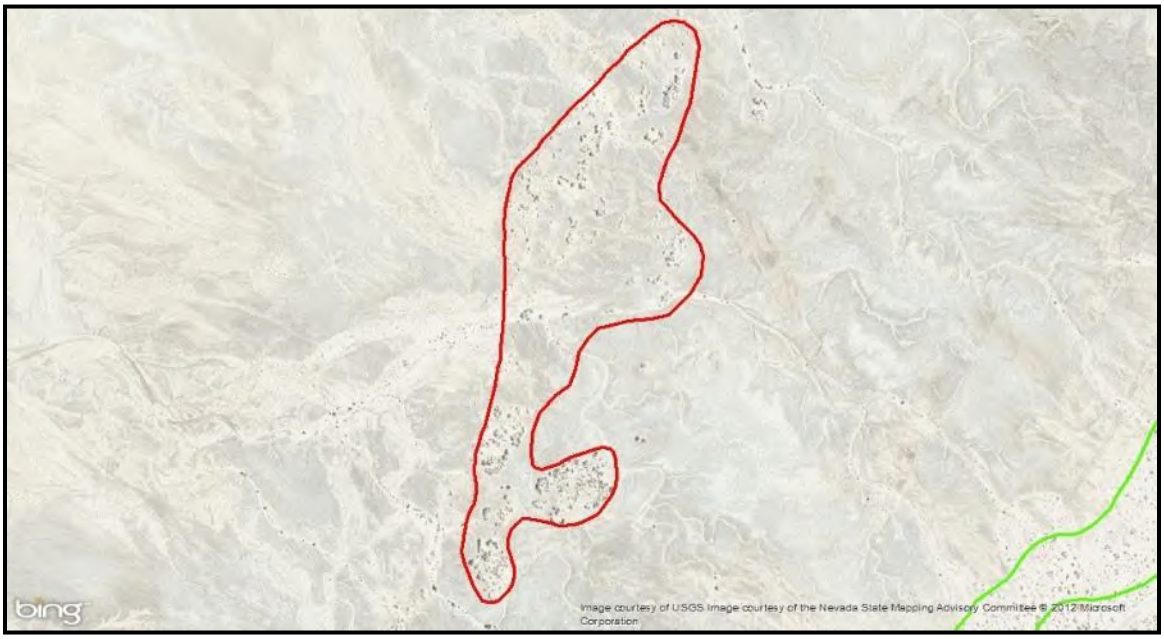
In the current study area, *Acacia greggii* is mapped in several washes of the Coyote Mountains, and several fans below Davies Canyon of the Yuha Desert, in the Salton Sea South subarea. It is also mapped in a number of washes in the Chocolate Mountains of the Picacho subarea. No *Hyptis emoryi* stands were mapped.

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



## *Allenrolfea occidentalis* Alliance (3721)

**I**odine bush scrub Alliance




This image shows an isolated stand of *Allenrolfea occidentalis* in the middle of a playa.

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

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

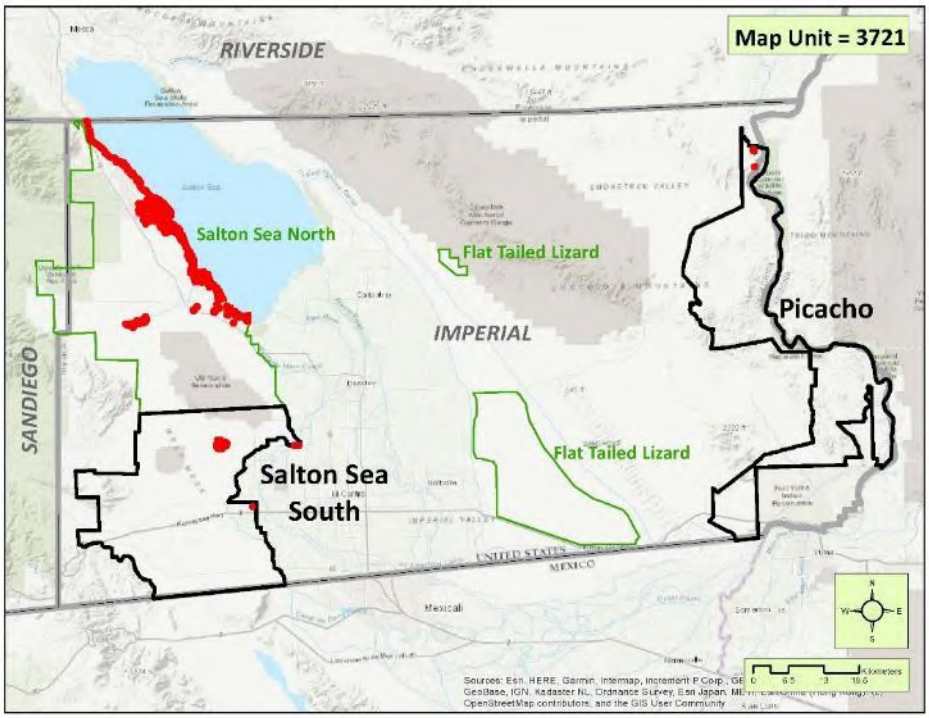
**DESCRIPTION:** Polygons mapped as this Alliance typically have *Allenrolfea occidentalis* comprising more than 2 percent absolute cover in the shrub canopy and no other species with greater or equal cover, except *Suaeda moquinii*, *Atriplex confertifolia*, or *A. canescens*. Leaves are usually scale-like 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 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.

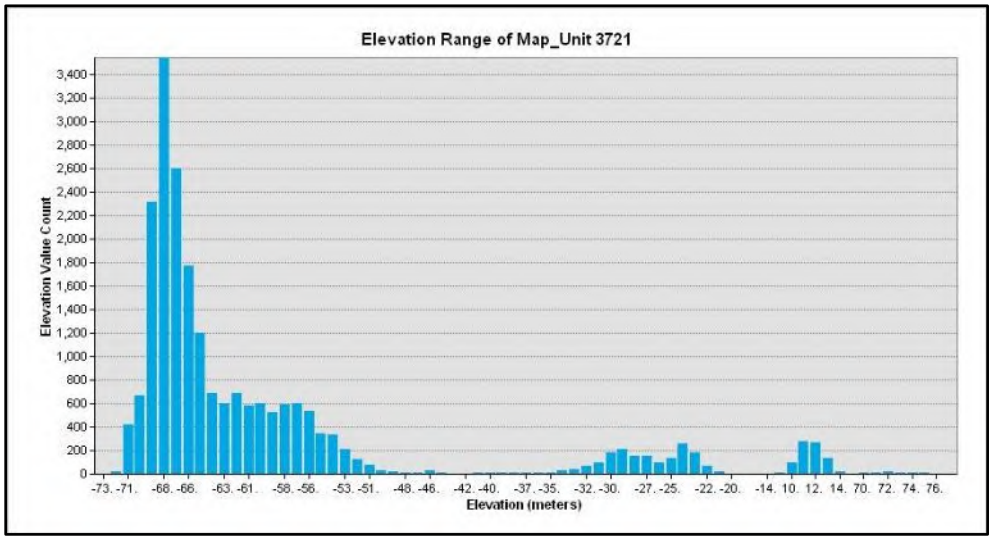
**TYPES WITH SIMILAR PHOTO INTERPRETATION SIGNATURES:**

- *Atriplex canescens* Alliance (5111) – Cloning appears less frequently in this type and hummocky topography is not isolated to where the individual plants occur.
- *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 lentiformis* Alliance (3722) – *S*hrubs may have a tawny, puffier crown. Stands of *A. lentiformis* generally are below the Minimum Mapping Unit size and are treated as an inclusion within the Alliances of other alkali species.
- *Suaeda moquinii* Association (3725) of the *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 prevalent along the western shoreline terraces of the Salton Sea, at several sites along San Felipe Wash, and by Kane Spring in the Salton Sea North subarea, and one unnamed playa southeast of Superstition Mountain in the Salton Sea South subarea; and three polygons are mapped on the western edge of the Colorado River floodplain terrace in the Palo Verde Valley of the Picacho subarea;



## *Ambrosia dumosa* Alliance (4111)

White bursage scrub Alliance


The image shows evenly spaced small shrubs of *Ambrosia dumosa* dominating the shrub layer in a stand surrounded by the *Larrea tridentata - Ambrosia dumosa* Alliance. The presence of almost pure stands of *Ambrosia dumosa* is commonly a result of a recently cleared or burned stand of vegetation formerly in the *Larrea tridentata – Ambrosia dumosa* Alliance.

In the foreground on the rocky alluvial surface are small light gray *Ambrosia dumosa* shrubs, which continue up onto the rocky slopes.

***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. 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 (especially the northwestern portion of the mapped area), 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.

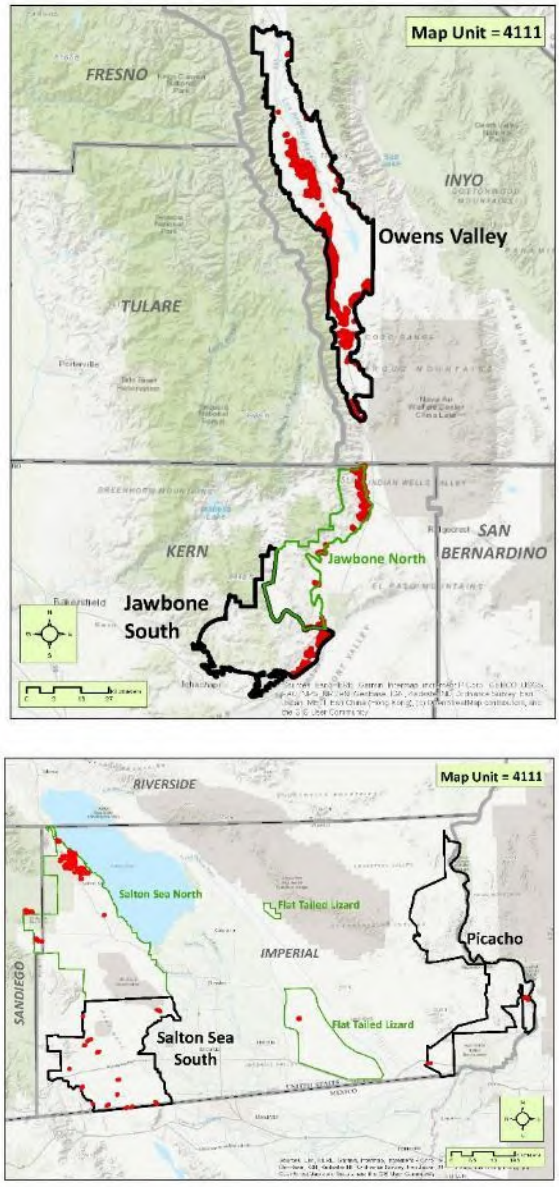
Like several Alliances in the study area (especially noteworthy is the *Atriplex confertifolia* Alliance), *Ambrosia dumosa* has a broad and somewhat bi-modal distribution. *Ambrosia dumosa* individuals occur as a component or dominant shrub in high-elevation settings along the eastern Sierra Nevada 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:**

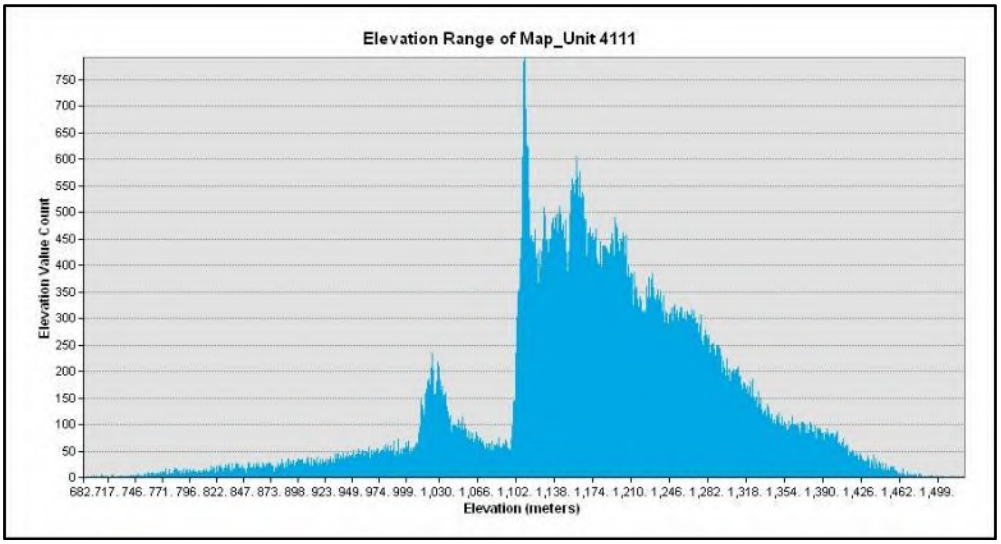
- *Ambrosia salsola – Bebbia juncea* Alliance (7211) – *Ambrosia salsola* has a similar signature but is more likely to occur in fluvial-related disturbances, especially in conjunction with rivulet-strewn sheet flow and lower-energy wash environments. It does not occur on steep or rocky slopes. This Alliance is more likely to colonize anthropogenic clearings rather than burns.
- *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 (actoni, virginensis) – Viguiera reticulata* Alliance (5211) – This type colonizes on steep slopes of the desert mountain ranges shortly after a burn. Cover tends to be sparser in these settings and very difficult to discriminate on medium- to light-colored substrate. This species also ranges out of the desert and occurs in similar post fire settings.
- *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.
- *Ericameria nauseosa* Alliance (5212) – *E. nauseosa* tends to have a high variability of cover across the stand, and individual shrubs also vary considerably in size. Signature color is usually gray to blue-green. The ranges of the two species overlap; *E. nauseosa* does not generally have *Larrea tridentata* adjacent or nearby.
- *Grayia spinosa* Sub-alliance (5411) of the *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419) – This Sub-alliance occurs in colder locations, generally in the lowest portions of cold-air basins, or on gentle to moderate slopes on desert ranges at higher elevations. 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)**

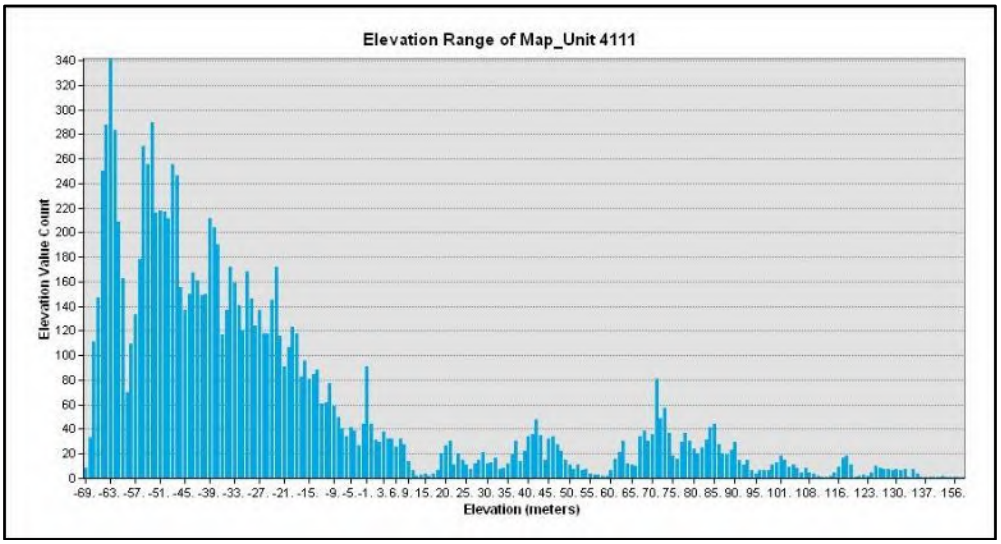



**DISTRIBUTION:** This Alliance is found throughout the DRECP area, but primarily in the Mojave Desert regions. The Alliance does not occur in the Western Antelope Valley zone or in the foothills of the Transverse Ranges. *Ambrosia dumosa* is less common in the Colorado Desert but does occur frequently as a co-dominant with *Larrea tridentata* on lower fans and bajadas. In the current study area, *Ambrosia dumosa* was mapped on the eastern and western lower alluvial fans adjacent to the Owen River floodplain, Owens Lake, and Haiwee Reservoir, all in the Owens Valley subarea; the eastern edge of the desert foothills of the southern Sierra Nevada in the Jawbone North and South subareas; two polygons were mapped in the Picacho subarea, one just south of Interstate 8, and the other on a calcareous rock outcrop north of Senator Wash; and in a number of sites scattered within the Salton Sea North and South and Flat-Tailed Horned Lizard subareas.

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




North subareas




South subareas

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

Cheesebush – sweet bush scrub Alliance


This image depicts *Ambrosia salsola* colonizing a typical wash terrace setting.

The scattered shrubs in the foreground of this photo are the two-tone light green and tawny colors of *Ambrosia salsola* occupying a sheet wash setting.

***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*, or *Brickellia desertorum*.

Note: There is a 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 Jawbone South and Owens Valley subareas. Florisitic 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. The Salton Sea region, which includes Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.

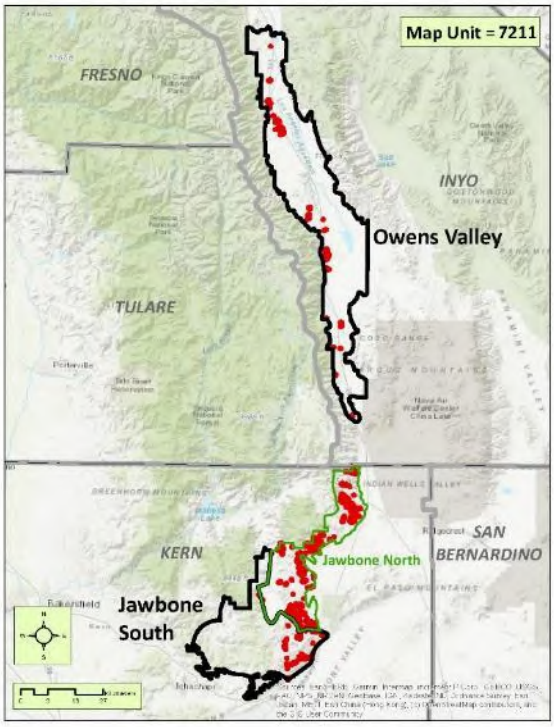
**PHOTOINTERPRETATION SIGNATURE:** Stands of *Ambrosia salsola* vary in cover from sparse to moderately dense. Individuals appear as small gray to gray-brown to yellow-brown shrubs with diffuse crowns. Stands occurring in wash settings rarely have dense cover and vary considerably along the weaker margins 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.

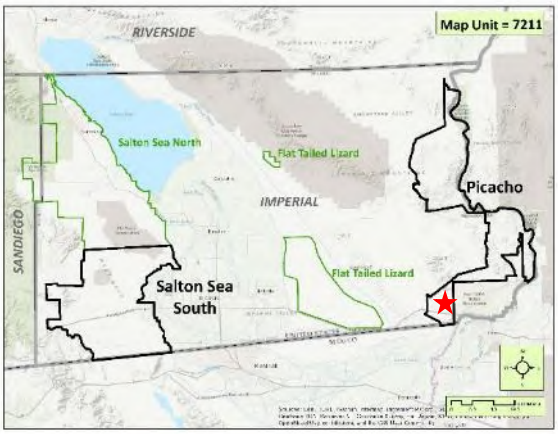
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *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. In Jawbone canyon, these two species frequently mixed or graded into one another on the alluvial fans and wash terraces. In this setting, OHV disturbance fragments these stands affecting cover, distribution, and typical signature correlates. Cover varies considerably along the less-active channel margins, and overall distribution occurs in clumpier patterning.
- *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.

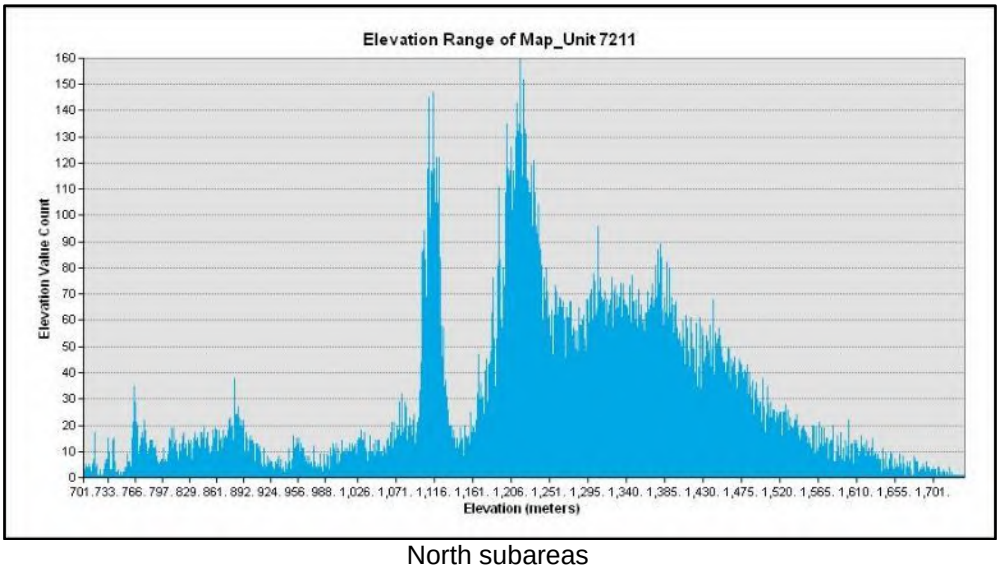
***Ambrosia salsola – Bebbia juncea* Alliance (7211)**




**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 along the western alluvial fan in the Owens Valley subarea; along the desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas, and as one polygon (represented as a star) in the Picacho subarea.

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




North subareas

**Due to small aerial extent no Elevation Range Chart is provided**

South subareas

## *Ambrosia salsola* Mapping Unit (formerly Alliance) (4216)

Cheesebush scrub Alliance


This image depicts *Ambrosia salsola* colonizing a typical wash terrace setting.

The scattered shrubs in the foreground of this photo are the two-tone light green and tawny colors of *Ambrosia salsola* occupying a sheet wash.

***Ambrosia salsola* Mapping Unit (formerly Alliance) (4216)**

**DESCRIPTION:** In this Mapping Unit, *Ambrosia salsola* is strongly dominant, comprising more than 60 percent relative cover in the dominant shrub layer. 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 sites. Most non-fire-related stands of *A. salsola* are associated with washes in mid and lower elevations. *A. salsola* may mix with equal or somewhat higher amounts of *Senna armata* in washes and still be considered the *A. salsola* Mapping Unit. Stands in washes were mapped if they were larger than five acres in size.

Note: There is a 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).

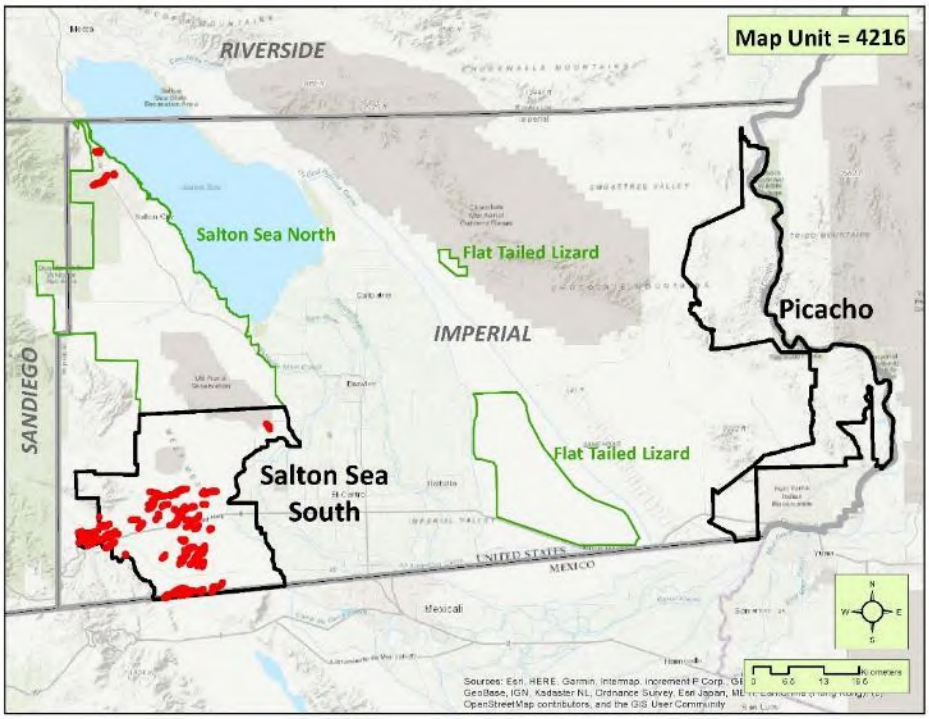
Note: As part of this project effort, additional classification data collection and analysis were performed for the Jawbone South and Owens Valley subareas. Florisitic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Ambrosia salsola* 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. The Salton Sea region, which includes Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.

**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.

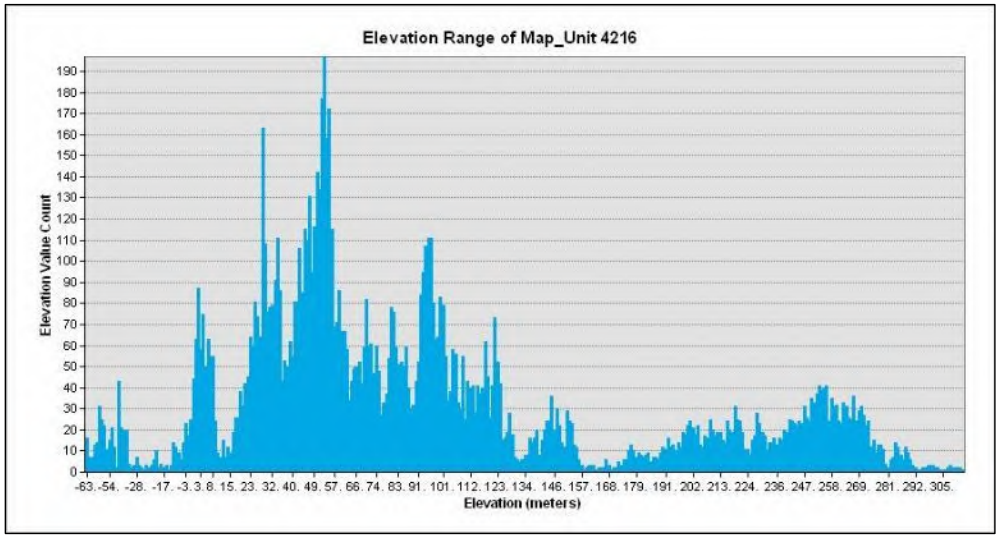
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *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. Cover varies considerably along the less-active channel margins, and overall distribution occurs in clumpier patterning.

***Ambrosia salsola* Mapping Unit (formerly Alliance) (4216)**

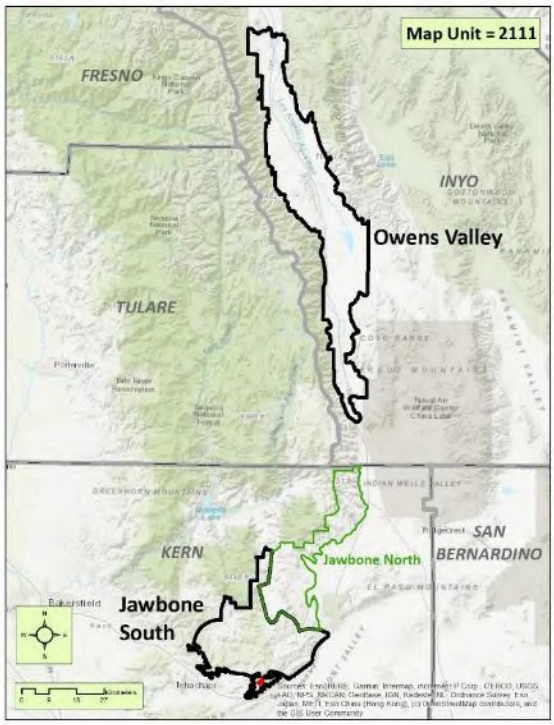



**DISTRIBUTION:** This Mapping Unit is found throughout the Western, Central, and Eastern Mojave Regions. Stands greatly diminish east of Yucca Valley and are mainly associated with human disturbance. Stands of this type are mostly absent from the eastern portion of the Colorado Desert. In the current study area, *Ambrosia salsola* is mapped in washes and some disturbed areas in the Salton Sea North and South subareas.

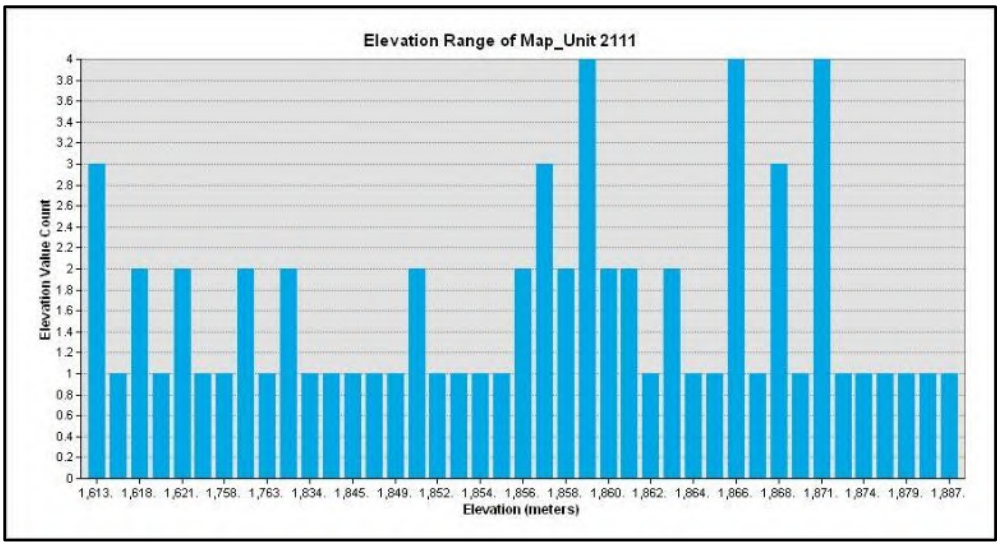


## *Arctostaphylos glauca* Alliance (2111)

Bigberry manzanita chaparral Alliance




**DISTRIBUTION:** Eight polygons of this Group were mapped in the Jawbone South subarea, none of which were verified or visited in the field. These stands were mapped at the Group level because the Alliance was not discernible from the imagery. All of them occur in the southernmost portion of the subarea. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.



## *Arctostaphylos viscida* Alliance (2117)

Whiteleaf manzanita chaparral Alliance

In this example, *Arctostaphylos viscida* strongly dominates the open shrub layer on a rocky convexity. *Pinus sabiniana* is a regularly associated emergent in these stands.

The stand depicted in this photo is strongly dominated by *Arctostaphylos viscida* on a gravelly substrate with a lower cover of annuals.

***Arctostaphylos viscida* Alliance (2117)**

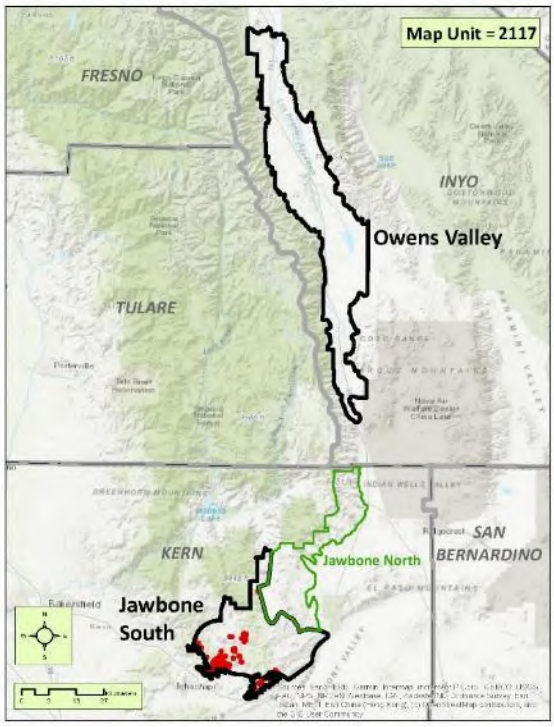
**DESCRIPTION:** *Arctostaphylos viscida* is the dominant or co-dominant species in the overstory shrub layer; conifers (*Pinus, Juniperus*) area absent or at very low cover. This Alliance is mapped only in the southern Sierra Nevada, on steep rocky slopes in the higher elevations or along gradual convex spurs or hilltops in the chaparral zone. Where *Arctostaphylos viscida* co-dominates with *Ceanothus cuneatus*, the stand is considered as the *Arctostaphylos viscida* Alliance. Co-dominance of *Arctostaphylos viscida* with *Cercocarpus montanus* is mapped to the *Cercocarpus montanus* Alliance.

**PHOTOINTERPRETATION SIGNATURE:** *Arctostaphylos viscida* appears as medium to tall brown rounded shrubs with well-defined crown margins. Stands frequently occur on light colored rocky substrates as scattered open individuals or in clumps of individual crowns that coalesce into a smooth and continuous canopy.

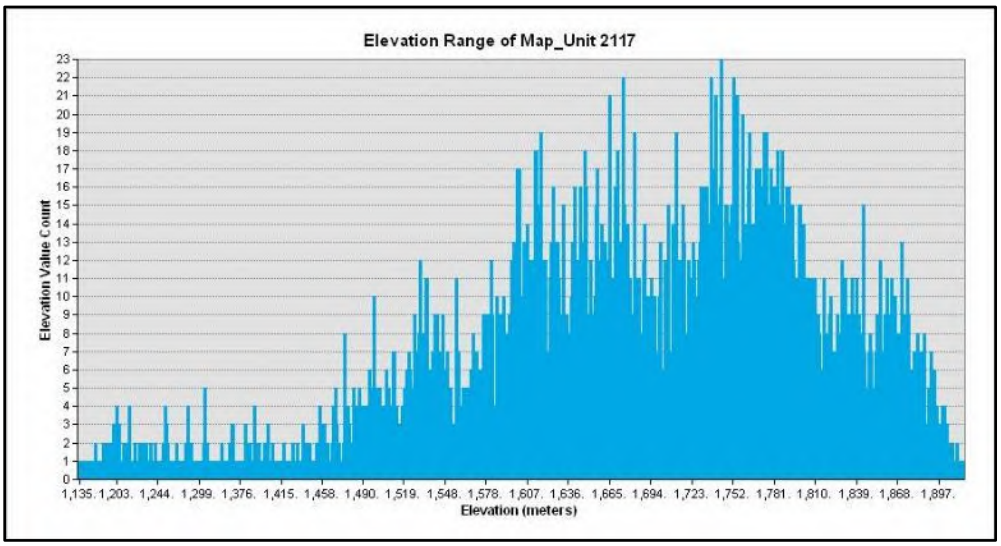
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Ceanothus cuneatus* Alliance (2116) – Individuals of this type have a grayer color and tend not to have as broad of a crown as *A. viscida*. These species frequently mix together and dense stands form diverse complexing mosaics of texture and signature that make it difficult to accurately discern relative cover between species.
- *Cercocarpus montanus* Alliance (2131) – Signature of these taller shrubs appear gray, sometimes dull green, in color with a wispy and diffuse crown margin. When *C. montanus* mixes with *A. viscida* in the tall shrub canopy, its slightly taller wispy branches texturize the upper shrub canopy, distorting the smoother textured crown signature of the *Arctostaphylos*.

***Arctostaphylos viscida* Alliance (2117)**




**DISTRIBUTION:** In the current study area, *Arctostaphylos viscida* is mapped primarily in the interior southern Sierra Nevada in the Jawbone South subarea, with several additional sites in the adjacent desert foothills.



## *Artemisia tridentata* Alliance (5311)

Big sagebrush Alliance


In this example, *Artemisia tridentata* occurs as a dense clumpy mat on a floodplain adjacent to riparian stands of *Populus fremontii*.

The photo shows a young stand of *Artemisia tridentata* growing in a disturbance setting on deep soils associated with floodplain deposits.

***Artemisia tridentata* Alliance (5311)**

**DESCRIPTION:** In stands of this Alliance *Artemisia tridentata* ssp. *tridentata* or *Artemisia tridentata* ssp. *parishii.* is dominant or co-dominant. No other single shrub species has greater cover except *Ericameria nauseosa, Eriogonum fasciculatum*, or *Eriodictyon trichocalyx.* Where *Prunus fasciculata* co-dominates, the *P. fasciculata* Alliance is mapped. Stands having more than 2 percent cover of *Juniperus californica* or *Yucca brevifolia* (regardless of height) are mapped as the *Juniperus* or *Yucca* Alliances, respectively. *A. tridentata* Alliance occurs on coarse alluvium (granitic sands and gravels) in valleys on the north side of the San Gabriel and Sierra Pelona Ranges and in Summit Valley north of Silverwood Lake. Stands in Owens Valley may include *Artemisia tridentata* ssp. *parishii*.

*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. tridentata.* ssp. *tridentata. A. tridentata.* 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.

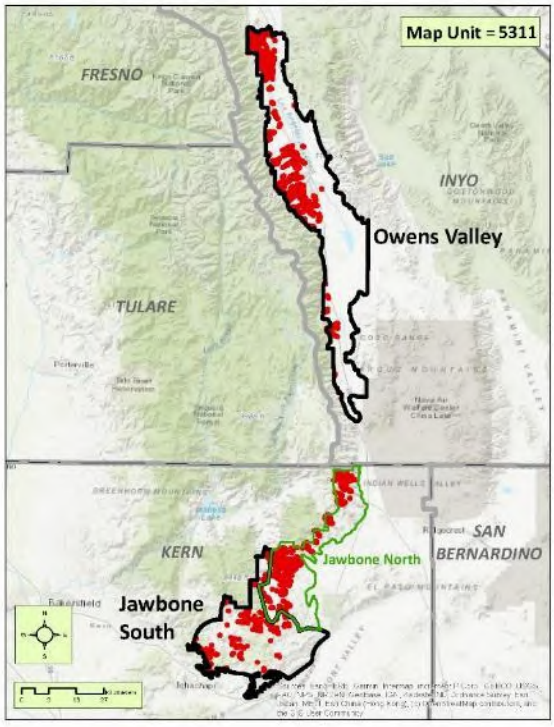
**PHOTOINTERPRETATION SIGNATURE:** *Artemisia tridentata* occurs in a wide range of cover, often as a co-dominant with other shrubs of similar height. In some post disturbance settings, where species diversity is low, the Alliance tends to display a more uniform bluish green signature color. In these settings, cover is more consistent across the stand, yielding a smoother texture overall. In early seral settings, species diversity can often be high, and patterning therefore tends to be clumpier with a high variability of color. As the stand matures, individual plants take on more of a bluish gray color and tend to vary more in size and height, resulting in a hummocky texture to the signature.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

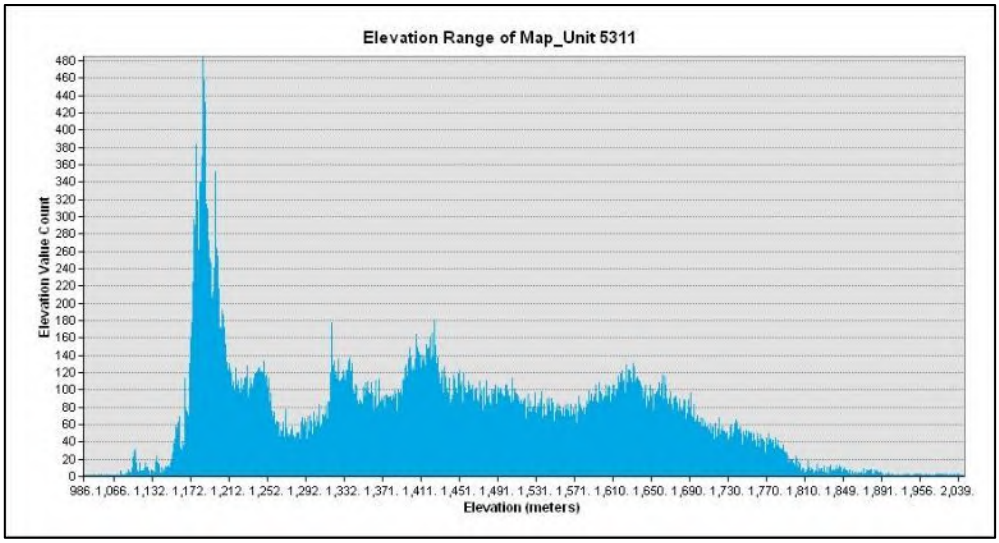
- *Ericameria cooperi* Association (5215) of the *Ephedra nevadensis – Lycium andersonii – Grayia spinosus* Alliance (5419) – Stands where *Ericameria cooperi* dominate tend to have a stippled texture due to the small size coupled with fairly dense shrub cover. Shrubs tend to be more uniform in height and the overall signature color is greener without the glaucous tint.

- *Ericameria nauseosa* Alliance (5212) – Both *Ericameria nauseosa* and *Artemisia tridentata* have a bluish gray to bluish green color depending on maturity of the stand. In early seral settings, *A. tridentata* tends to occur in denser cover and have larger crowns. In more mature stands, *A. tridentata* is less likely to be found in disturbed settings and more often will occur on lower slopes and gravelly floodplains. Older stands of *E. nauseosa* are more associated with post disturbance cleared sites.
- *Prunus fasciculata – Salazaria mexicana* Alliance (7212) – When occurring in an early seral patchwork, *Prunus fasciculata* is often found adjacent to stands of *Artemisia tridentata*. Shrubs are larger, with a more distinct crown that overall is a darker green. Like *A. tridentata*, shrub cover within this Alliance varies considerably across the stand, especially in early seral settings.

***Artemisia tridentata* Alliance (5311)**




**DISTRIBUTION:** The highest concentration of stands for this Alliance occurs in the area along the northern foothills of the San Gabriel and San Bernardino Mountains, the southern Sierra Nevada, and the Owens Valley. In the current study area, *Artemisia tridentata* is mapped throughout the western alluvial fans of the Owens Valley subarea; and throughout the interior and desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas.



## *Atriplex canescens* Alliance (5111)

Fourwing saltbrush scrub Alliance

*Atriplex canescens* occurs as grayish blue clumps on sandy hills mixed with *Yucca brevifolia* and a few *Prosopis glandulosa* in the lows. White scalds of sparse *Suaeda moquinii* border to the north and south.

*Atriplex canescens* appears in the foreground, and is mixed with emergent *Yucca brevifolia* in the background.

***Atriplex canescens* Alliance (5111)**

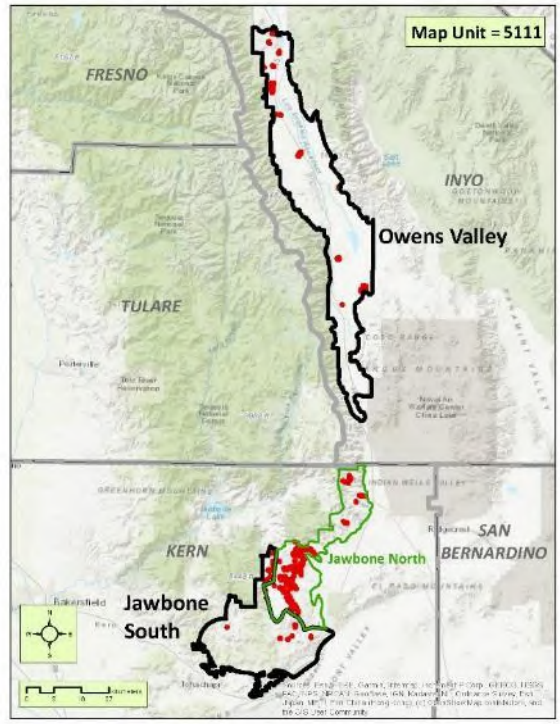
**DESCRIPTION:** This Alliance is mapped where *Atriplex canescens* characterizes stands, typically with the highest cover, though *Ambrosia dumosa* or *Atriplex polycarpa* may have similar or higher cover. Some stands have emergent *Yucca brevifolia*. This species prefers sandy substrates, usually stabilized dunes or sand ridges, and also sandy washes surrounded by *Larrea tridentata – Ambrosia dumosa, Yucca brevifolia* or *Yucca schidigera* Alliances. Stands with co-dominant *Ephedra californica* or *E. trifurca* are mapped as the *Ephedra californica – Ephedra trifurca* Alliance. The *Atriplex canescens* Alliance may occur above 1000 meters (3280 foot) elevation in sandy washes in granitic mountains. The variety *linearis* prefers saltier or more alkaline sand, adjacent to *Suaeda moquinii* (downslope) or *Atriplex polycarpa* (upslope). A different but ecologically similar variety, *A. canescens* var. *laciniata*, occurs around the low dunes and playa margin at Palen Dry Lake. This variety also appears to be more salt-tolerant and can occur in low numbers adjacent to *Allenrolfea occidentalis* on the playa. If *A. canescens* and *Allenrolfea occidentalis* co-dominate, the Alliance is the latter.

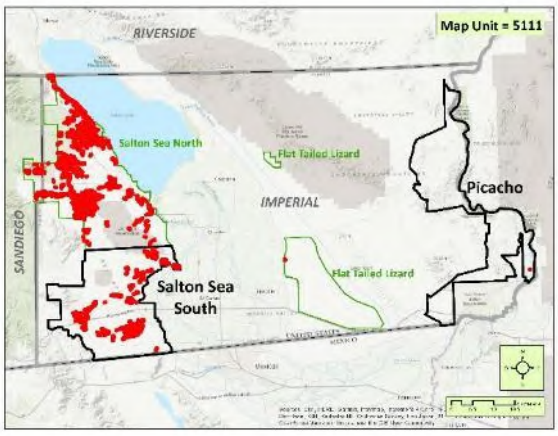
**PHOTOINTERPRETATION SIGNATURE:** Except in washes, cover is usually highly variable within the stand because of variability in the sand content of the substrate. This type rarely forms dense or extensive stands. The signature most commonly appears brown to tan, less commonly gray to grayish blue. *Atriplex canescens* often has a darker tone and slightly larger crown than most other *Atriplex* species. They occur on mounded hummocks or small sandy hills, in or adjacent to sandy washes and in disturbance areas such as road corridors or cleared land. They also are mapped close to playa margins in similar sandy settings.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Allenrolfea occidentalis* Alliance (3721) – In playa margins, salt-tolerant varieties of this *Atriplex* at times co-occur with *A. occidentalis*. In these situations, the comma-shaped patterns that often result when *A. occidentalis* clones form a distinctive photo signature.
- *Ambrosia salsola - Bebbia juncea Alliance* (7211) – *Ambrosia salsola* is more directly related to disturbance (such as fire, clearings, washes) and typically have a smaller, gray crown.
- *Atriplex polycarpa* Alliance (4113) – These shrubs more commonly occur in denser, more continuous stands along stream and wash corridors and upslope in less alkaline portions of the salt scrub communities surrounding larger playas.
- *Ericameria nauseosa* Alliance (5212) – These shrubs are primarily are related to human disturbance such as road corridors, clearings, agricultural fringes and fallow agricultural fields.
- *Suaeda moquinii* Association (3725) of the *Suaeda moquinii – Isocoma acradenia* Alliance (7411) – In sandy, alkaline settings, it is almost impossible to distinguish the *Suaeda* from *Atriplex canescens*. *S. moquinii* has on the whole a slightly more brownish-deep red color. Adjacent linear dunes may be indicators of *A. canescens* presence.

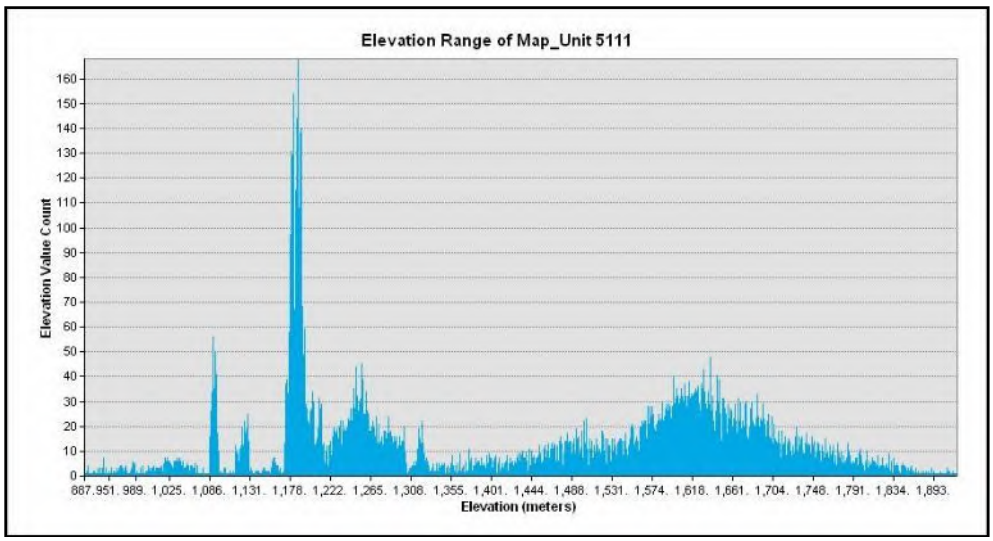
***Atriplex canescens* Alliance (5111)**



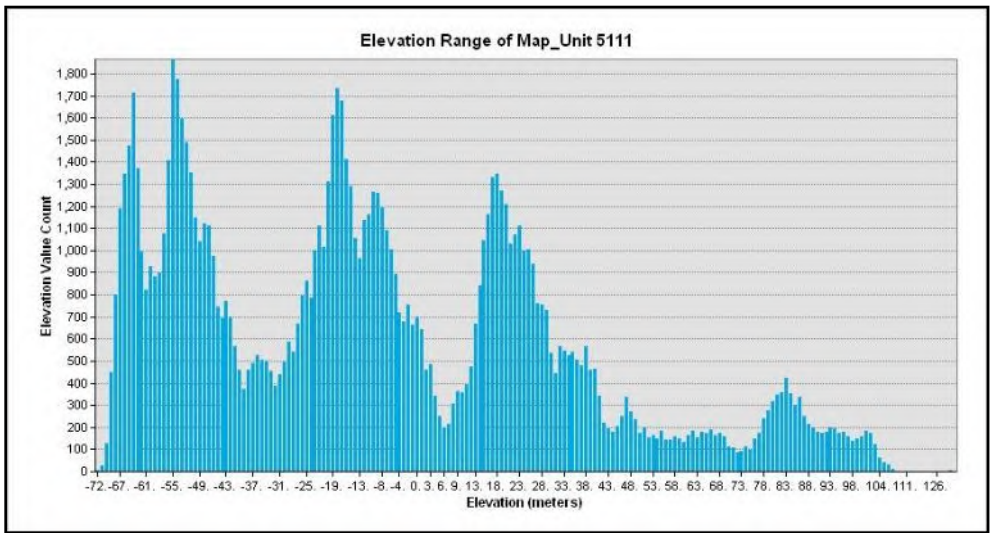




**DISTRIBUTION:** *Atriplex canescens* is found in every region of the DRECP from the Mojave Desert to the Colorado Desert, and can occur in a variety of sandy settings including washes, edges of dunes, sandy hills and playa margins. In the current study area, *Atriplex canescens* is mapped on alluvial fans and sandy disturbances in the Owens Valley subarea; in the desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas. It is also mapped on the low hills, fans, and terraces throughout the Salton Sea North and South subarea; and one polygon on the Colorado River floodplain northeast of Yuma in the Picacho subarea.

***Atriplex canescens* Alliance (5111)**




North subareas




South subareas

## *Atriplex confertifolia* Alliance (5112)

Shadscale scrub Alliance

This large-scale image of *Atriplex confertifolia* shows the variation in shrub density and scalding within a single stand. The white, highly reflective scalding is a typical patterning for this type. Note: this screenshot is a portion of a larger polygon whose boundaries are not shown.

*Atriplex confertifolia* occurs in this photo as evenly spaced individuals over a grassy understory interspersed with some exposed scalding as shown in the upper left portion of the image.

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

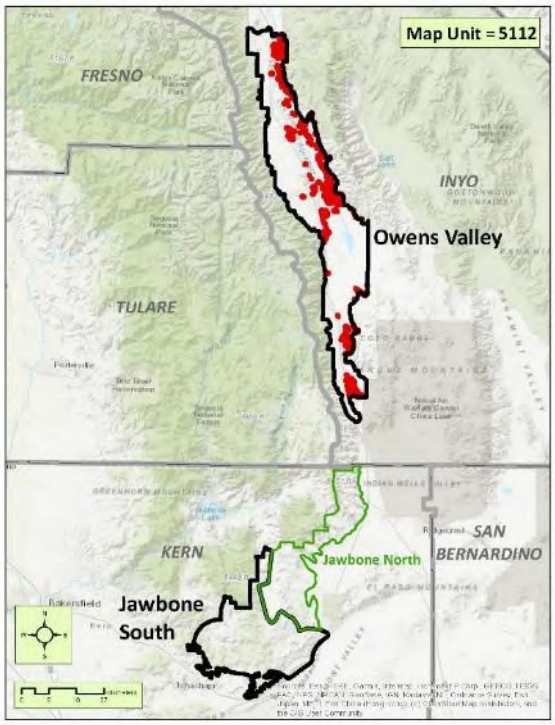
**DESCRIPTION:** This Alliance is mapped where *Atriplex confertifolia* dominates or co-dominates the shrub layer. Stands may occur in alkaline/saline valleys or playas but also occur in the upper mid-elevation Mojave Desert on rolling hills and slopes with higher pH substrates. Stands are particularly common in the northern portion of the mapping area on rhyolite, upland carbonate soils or in silty badlands. According to Charlton (in Lichvar et al., (2004)), at Edwards Air Force Base *Atriplex 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). When *Atriplex confertifolia* is co-dominant with *Suaeda moquinii* on playas, the Alliance is *S. moquinii.* If *A. confertifolia* and *Allenrolfea occidentalis* co-dominate, the Alliance is the latter. When *Atriplex confertifolia* is mixed with *Stanleya pinnata, Lepidium fremontii,* and *Atriplex lentiformis* var. *parryi,* the Alliance is *Atriplex confertifolia*. The Alliance is also called out as *Atriplex confertifolia* when *Atriplex confertifolia* is associated with pool and swale topography and *Lasthenia* spp. in the Antelope Valley, and when *Atriplex spinifera* and/or *Artemisia spinescens* are co-dominant with *A. confertifolia* on playa edges (as at Edwards Air Force Base). If *Larrea tridentata* is co-dominant, then the stand is considered as *Larrea tridentata* Alliance.

**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. Examples of this setting are found in the Lancaster area, where *Yucca brevifolia* often occurs as a sparse, widely scattered emergent. *A. confertifolia* also occurs in very sparse stands on hills whose geologic substrate is composed of ancient alkaline lake deposits.

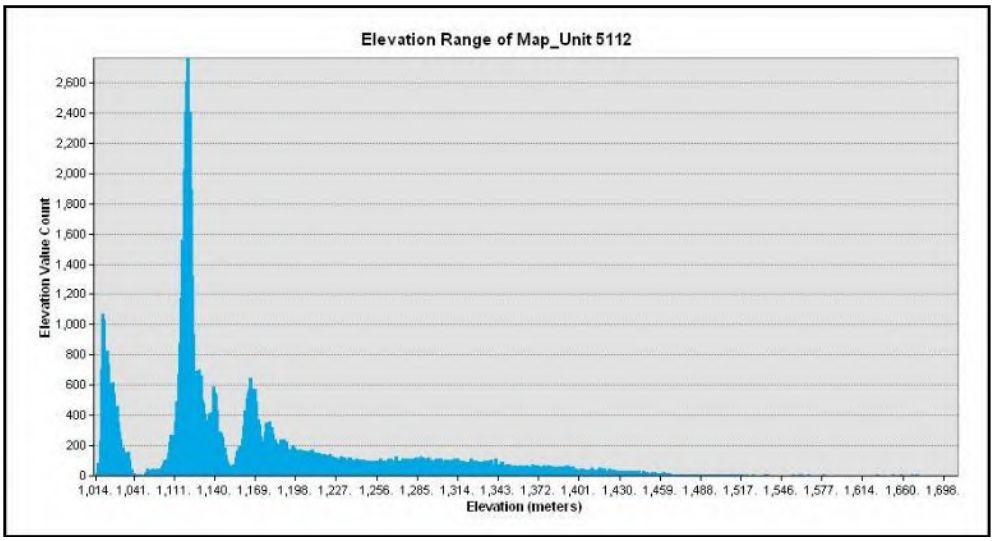
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Allenrolfea occidentalis* Alliance (3721) – These plants do not form extensive stands and occur in closest proximity to the most alkaline and saturated portions of the playa and salt pannes.
- *Atriplex canescens* Alliance (5111) – Near Mesquite Lake (in the northeastern portion of the mapping area) both of these Alliances frequently occur nearby in adjacent stands. Separating the two Alliances in this area is extremely difficult because both occur in similar edaphic settings, making the signatures of each species alike. However, stands containing *A. canescens* in this region will often transition to sandier settings.
- *Atriplex lentiformis* Alliance (3722) – These shrubs rarely form dominant stands and occupy more alkaline and saturated portions of playa margins or highly disturbed cleared sites.
- *Atriplex polycarpa* Alliance (4113*)* – Shrubs have a slightly larger crown size, appear bluish gray, and can form much denser stands.
- *Suaeda moquinii* Association (3725) of the *Suaeda moquinii – Isocoma acradenia* Alliance (7411) – *Suaeda moquinii* shrub color typically has a darker, browner appearance.

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

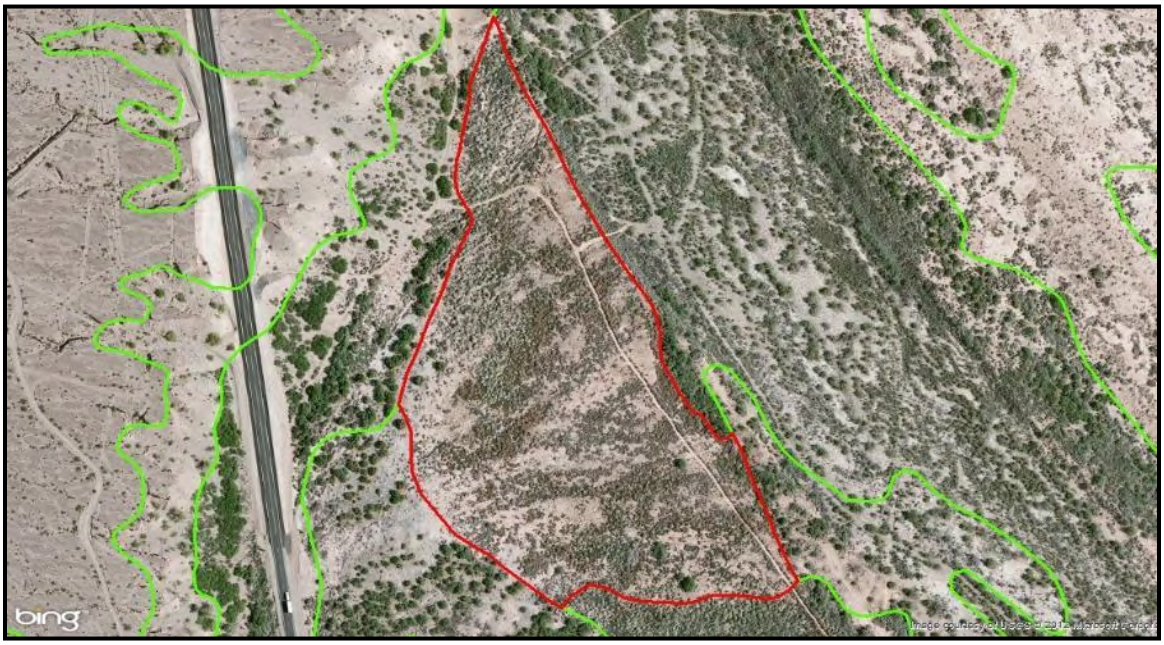



**DISTRIBUTION:** This Alliance is restricted to the Antelope Valley, Northern Mojave, the westernmost portion of the Central Mojave region, and the Eastern Mojave Desert region north of Mesquite Lake. Occurrences in the DRECP area represent the southernmost extent of this type, which extends northeast into the cooler, wetter climes of the Great Basin and the San Joaquin Valley. *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 current study area, *Atriplex confertifolia* is mapped primarily along the eastern alluvial fans above the Owens River, Owens Lake, Rose Valley, and Haiwee Reservoir, with a few sites on the western fans, all within the Owens Valley subarea.



# *Atriplex lentiformis* Alliance (3722)

Quailbush scrub Alliance




In this image *Atriplex lentiformis* (larger, blue-gray shrubs) are mixed with *Suaeda moquinii* (smaller, rust-colored shrubs) in a disturbed setting near the Colorado River.

The foreground shows the blue-gray leaf color of *Atriplex lentiformis* with the clustered, tawny seed heads. In the background, the *A. lentiformis* scrub appears tawny in color with exposed, leafless branches due to desiccation or stress.

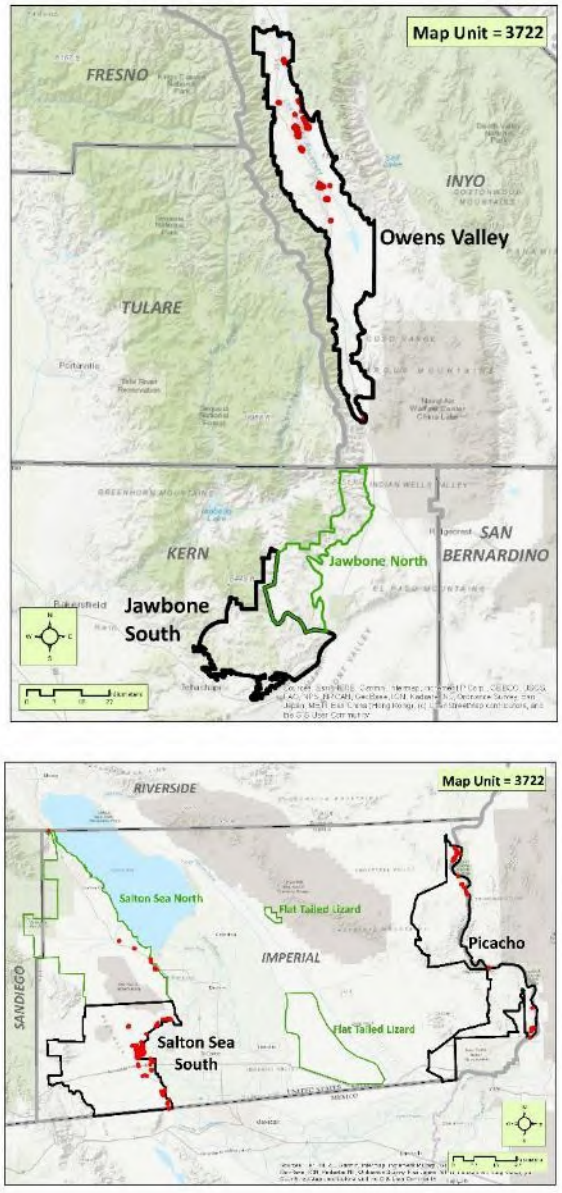
**DESCRIPTION:** For this mapping effort, both subspecies *Atriplex. lentiformis ssp. lentiformis (A. lentiformis)* and *Atriplex. lentiformis* ssp. *torreyi (A. torreyi)* are represented under the *Atriplex lentiformis* Alliance. Stands of this Alliance are strongly dominated (typically more than 60 percent relative cover) by *A. lentiformis* or *A. 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 where it is mixed with *A. polycarpa* and *A. canescens*. Rare small stands of *A. torreyi* occur on the beds of dry lakes. Mapped sites of *A. torreyi* are in Edwards AFB and at Koehn Dry Lake, or perhaps China Lake, locally, while stands are well-established in Owens Valley. Charlton (in Lichvar et al., 2004) states that *A. torreyi* 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. *A. torreyi* is usually associated with *Ericameria nauseosa, Suaeda moquinii* and/or *Atriplex canescens,* and is commonly associated with *A. confertifolia* or *A. spinifera* in communities adjacent to washes in or near playas. Stands of *A. torreyi* with dominant or co-dominant, *S. moquinii*, *A. canescens*, *A. confertifolia* or *A. spinifera* would be mapped as one of those Alliances respectively. For the Owens Valley area, stand of mixing *Ericameria nauseosa* and *Atriplex lentiformis* ssp. *torreyi* were mapped to the *Ericameria nauseosa – Atriplex lentiformis* Mapping Unit.

**PHOTOINTERPRETATION SIGNATURE:** Stands vary in cover from sparse to moderately dense with the plants appearing as small rounded blue gray to tawny-colored shrubs. Stands of *A. lentiformis* usually mix with many other species and can tolerate seasonally saturated, highly alkaline playa margins as well as disturbance-related sites such as old scraped fields and roadsides in addition to fluvial settings on alkaline-trending soils.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

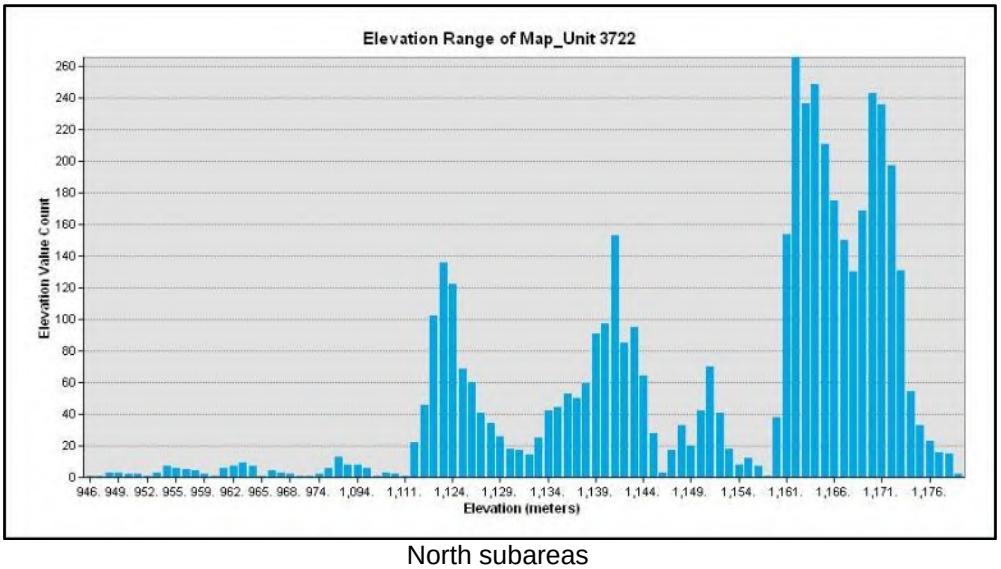
- *Atriplex confertifolia* Alliance (5112) – In settings where the two species co-occur, *A. lentiformis* tends to have significantly larger crowns, has a grassier understory, and is not as consistently spaced across the landscape.
- *Atriplex polycarpa* Alliance (4113) – Shrubs have less tolerance of alkaline or permanently flooded settings and tend to have a coarser, bluer gray signature.
- *Pluchea sericea* Alliance (4221) – These shrubs always occur in very dense stands and are more tolerant of permanently flooded (fresh or alkaline-trending) settings. The signature has a taller, smoother texture with the color being more of a greener blue.
- *Suaeda moquinii* Association (3725) of the *Suaeda moquinii – Isocoma acradenia* Alliance (7411) – Stands of *Atriplex lentiformis* tend to grow in a wider array of settings, especially regarding degrees of alkalinity. Both *Suaeda* and *A. lentiformis* are frequently found in disturbance settings. *A. lentiformis* tends to be larger, trends more toward the bluish hues and has a rounder crown.
- *Ericameria nauseosa – Atriplex lentiformis* Mapping Unit (5217) – Either species can be sub-dominant to co-dominant in the stand.

***Atriplex lentiformis* Alliance (3722)**

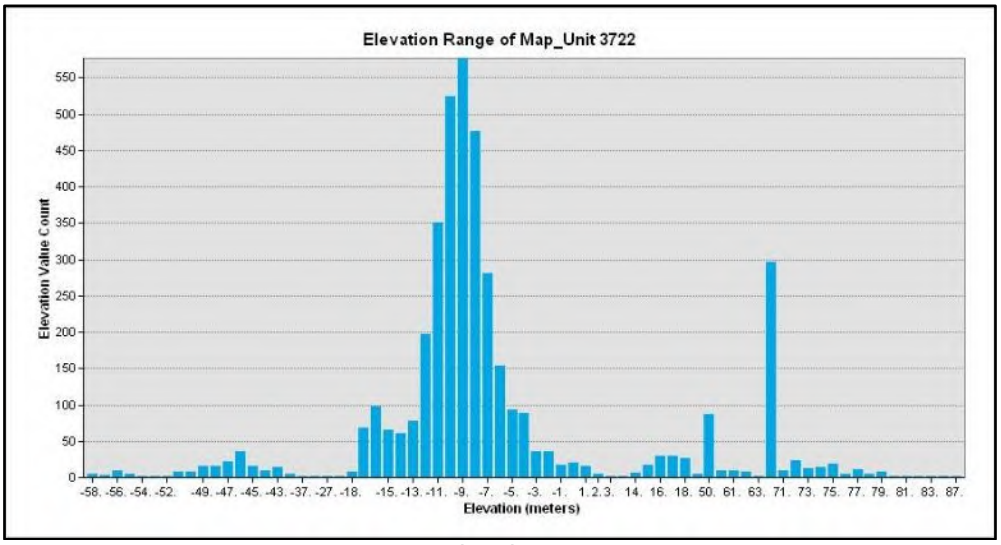



**DISTRIBUTION:** Stands are found in disturbed fluvial settings with alkaline soils along the Mojave and Colorado Rivers, in small populations on the margins of some dry lakes, and on old agricultural fields in the Salton Sea Trough. In the current study area, *Atriplex lentiformis* is mapped along the western edge of the Salton Trough and a few sites on West Mesa in the Salton Sea North and South subareas; at selected sites along the Colorado River floodplain in the Picacho subarea; and at a number of locations along the Owens River floodplain in the Owens Valley subarea.

***Atriplex lentiformis* Alliance (3722)**



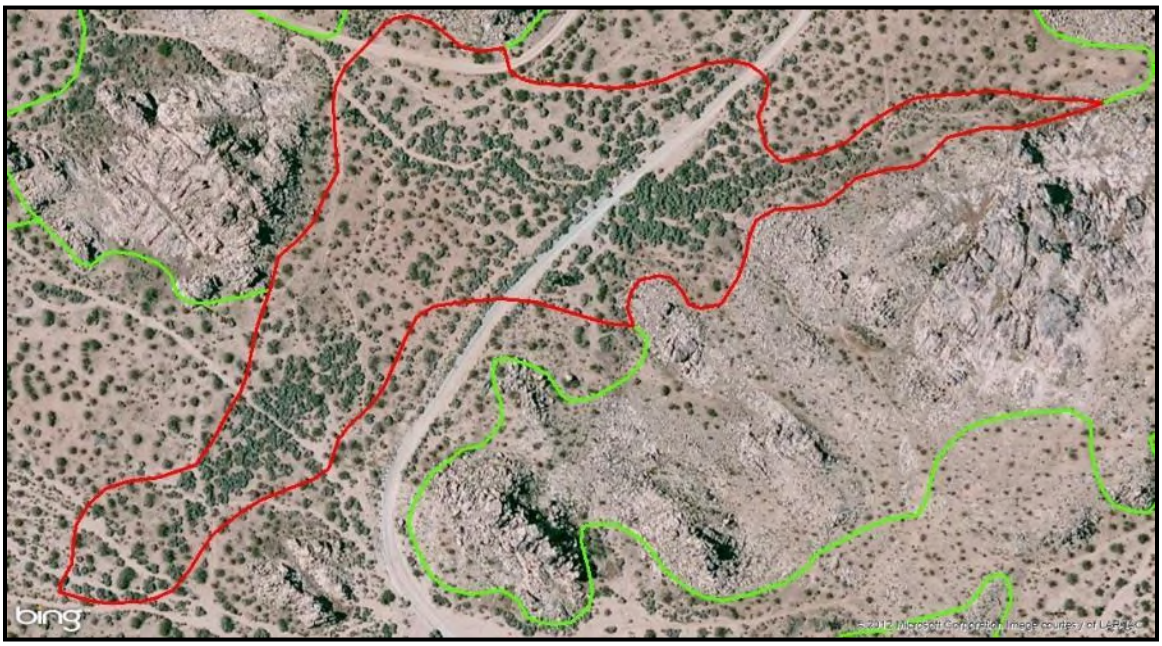

North subareas




South subareas

## *Atriplex polycarpa* Alliance (4113)

Allscale scrub Alliance




The bluish green *Atriplex polycarpa* congregates in dense patches within the highlighted polygon; *Larrea tridentata* and *Ambrosia dumosa* polygons surround.

The photo shows a wispy grayish green *Atriplex polycarpa* occupying a stream terrace.

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

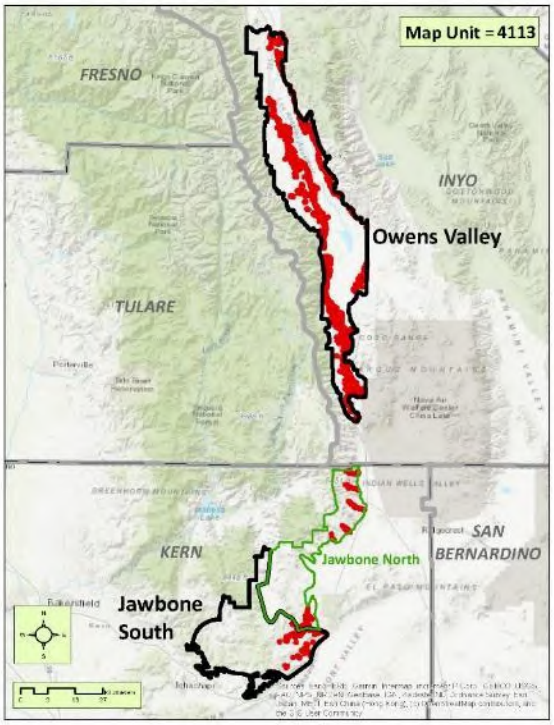
**DESCRIPTION:** This Alliance is mapped where *A. polycarpa* dominates the shrub layer, usually with 2 percent absolute cover or more, and greater than 50 percent of the relative shrub cover. Stands can occur on broad flats, in washes, on steep volcanic ravines and slopes, and as disturbance stands 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*. 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*.

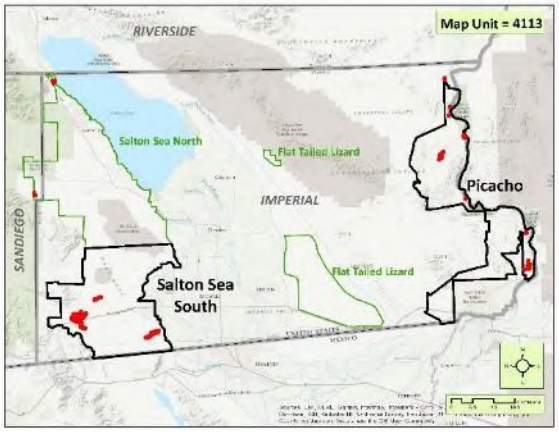
**PHOTOINTERPRETATION SIGNATURE:** Stands range from sparse to dense cover with a wide range of colors that vary from white to dark gray to a bluish gray to brown. Shrubs tend to have a coarser texture when they congregate into dense clumps and/or semi-continuous stands that establish on a wide range 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 canescens* Alliance (5111) – These shrubs are typically found in sandy, well-drained areas and appear as larger, brownish gray shrubs that are evenly spaced. At higher elevations, *A. canescens* is more often associated with *Yucca brevifolia*. *A. polycarpa* is also less likely to occur near the margins of hyper-alkaline larger playas.
- *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.
- *Ericameria nauseosa* Alliance (5212) – These shrubs are primarily related to human disturbance and occupy roadside clearings and fallow agriculture fields in less salty or alkaline settings.

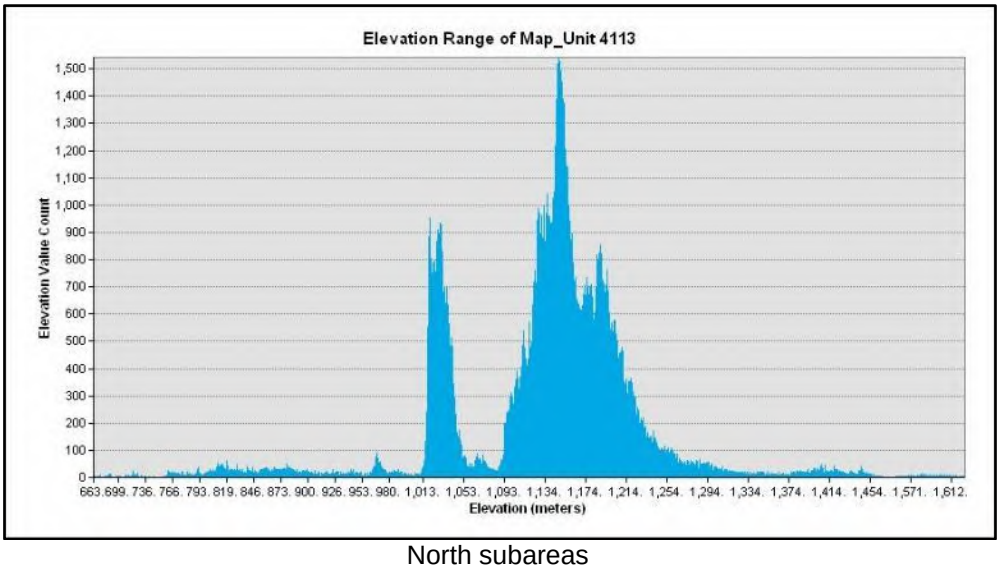
***Atriplex polycarpa* Alliance (4113)**



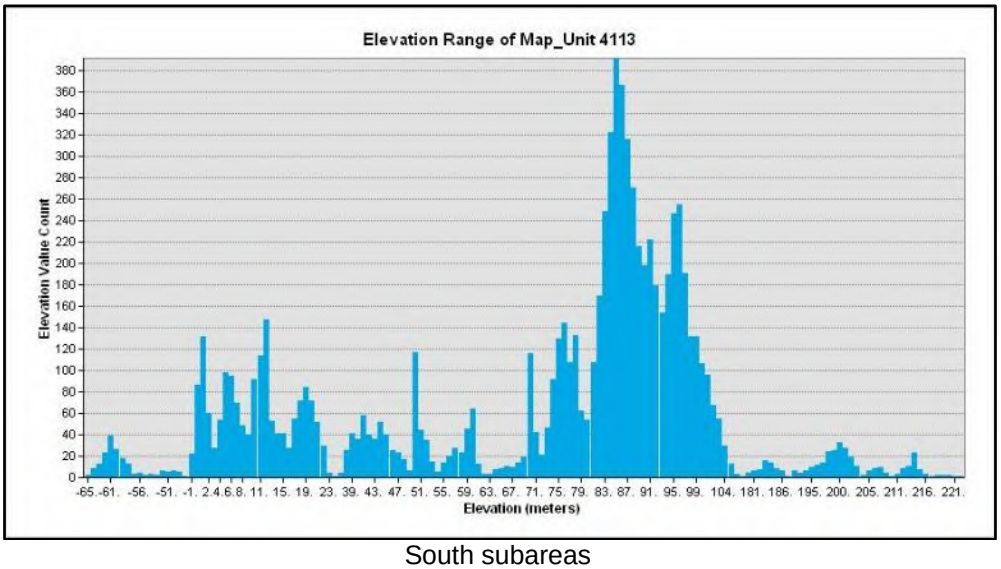




**DISTRIBUTION:** *Atriplex polycarpa* has the broadest ecological distribution and the highest shrub cover of any of the *Atriplex* species in the mapping area. This Alliance is distributed throughout much of the Western and Central Mojave Deserts where playa systems are frequent and extensive, lying 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* is very prevalent along the lower fans adjacent to the Owens River floodplain, Owens Lake, Haiwee Reservoir, and Rose Valley, all in the Owens Valley subarea; in Jawbone Canyon among other smaller canyons in the desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas; a number of sites in the Picacho subarea, the largest being west of Imperial Dam, and at Vinagre Wash-Pinto Wash-Coyote Wash vicinity of Coyote Wells, and disturbed areas adjacent to Halfhill Lake and Desert Shores in the Salton Sea North and South subareas..

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




North subareas




South subareas

## *Baccharis emoryi – Baccharis sergiloides* Alliance (1423)

Emory's and Broom baccharis thickets Alliance

In this example, *Baccharis sergiloides* occupies a narrow wash at the base of the desert foothills. *B. sergiloides* is seen as the clumpier green shrub alongside grayer *P. fasciculata* clumps.

*Baccharis sergiloides* dominates an arroyo just downstream from a desert spring.

***Baccharis emoryi – Baccharis sergiloides* Alliance (1423)**

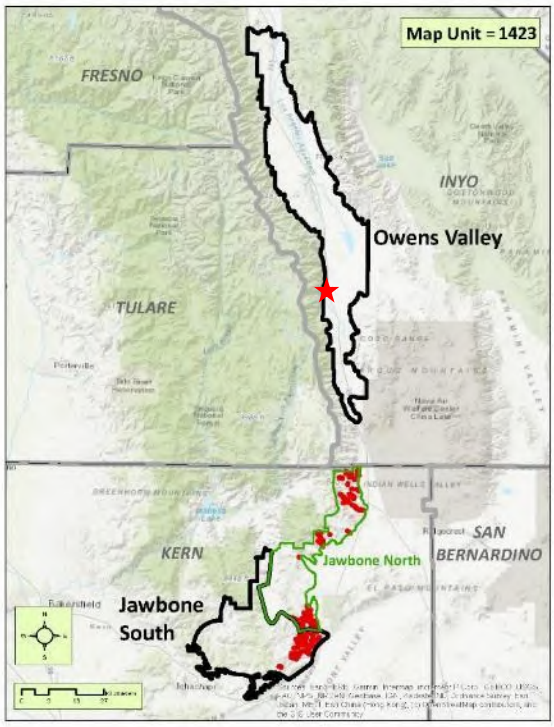
**DESCRIPTION:** *Baccharis sergiloides* or *Baccharis emoryi* is dominant and characteristic; stands are usually small and associated with rocky granitic arroyos and narrow bouldery drainages adjacent to springs and seeps. Usually in desert mountains or ephemeral creeks in foothills on the western edge of the DRECP. Where *Baccharis emoryi* is present, it must be greater than 3% cover of a single stand and exceed 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 of *B. emoryi* have been detected in the DRECP study area in the Colorado River Valley north of Blythe. *B. sergiloides* has been observed as small patches in upper portions of protected side drainages in Jawbone Canyon, many times in close proximity to a natural spring or dammed pond.

**PHOTOINTERPRETATION SIGNATURE:** *Baccharis sergiloides* occupies narrow wash channels as linear clumps of medium-sized shrubs, army green or dark green color. Often denser stands contain other wash species, such as *Ericameria paniculata* or *Prunus fasciculata*, displaying similar signatures (stature and color) that make them difficult to discern from one another. Sparser stands tend to depict these same colors with a sparsely vegetated, very light-colored sandy to gravelly substrate. Individual crowns are small and poorly defined.

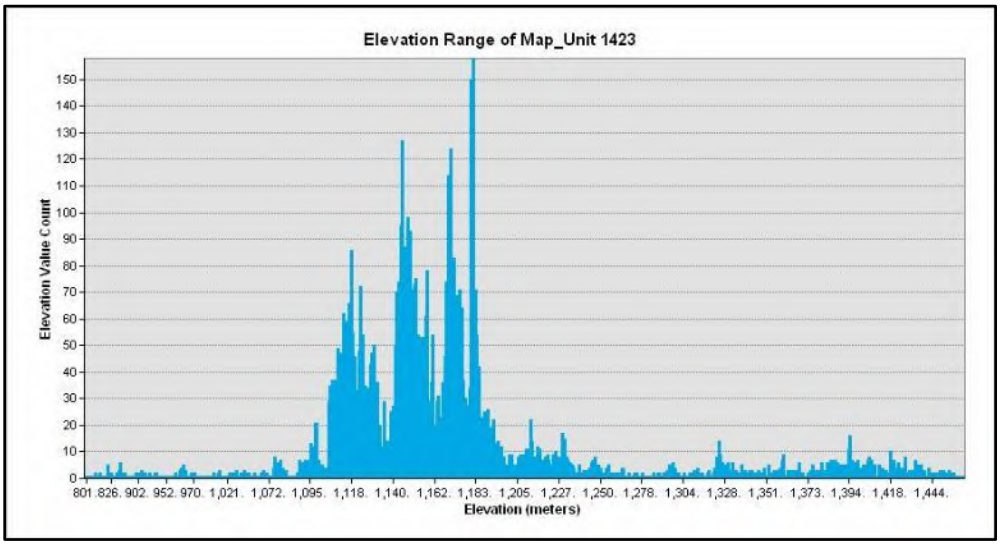
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Baccharis salicifolia* Alliance (1422) – These species tend not to overlap and mix in the same stand, but do have a similar color, stature, pattern expression and environment. However, *Baccharis salicifolia* more typically is found in larger canyon drainages occupying braids of the alluvial wash, as opposed to narrow arroyos in smaller side canyons where *B. sergiloides* is usually found, often adjacent to small isolated desert springs.
- *Ericameria paniculata* Alliance (4213) – *E. paniculata* is a small- to medium-sized shrub typically found in slightly more protected canyon washes with less active wash channels, where it may co-occur with *B. sergiloides*. Stature is similar between the two species with *E. paniculata* displaying a grayer color tone. Many times *B. sergiloides* occupies the channel directly downstream from a water source (dammed pond, spring) and *E. paniculata* mixes further downstream with another similar looking shrub, *Prunus fasciculata*.
- *Lepidospartum squamatum* Alliance (4212) – *L. squamatum* is shrub of smaller stature that is more typically found in active wash channels. It typically displays a gray-brown color, as opposed to the greener color of the *Baccharis*. These two infrequently mix, but do overlap near dammed ponds or settling basins where *B. sergiloides* occupies the more saturated end and *L. squamatum* occurs along the slightly drier edges.

***Baccharis emoryi – Baccharis sergiloides* Alliance (1423)**




**DISTRIBUTION:** In the current study area, most stands of *Baccharis sergiloides* are mapped in the desert foothills of the southern Sierra Nevada in the Jawbone North and South subareas, and one site (represented as a star) along Cartago Creek in the Owens Valley subarea.



## *Baccharis salicifolia* Alliance (1422)

Mulefat thickets Alliance

In this example, *Baccharis salicifolia* occupies a small channel braid with scattered individuals seen as dark green, small-crowned shrubs.

*Baccharis salicifolia* dominates the riparian shrub layer along the margins of the Mojave River. Tall individuals of *Populus fremontii* occur in the background.

***Baccharis salicifolia* Alliance (1422)**

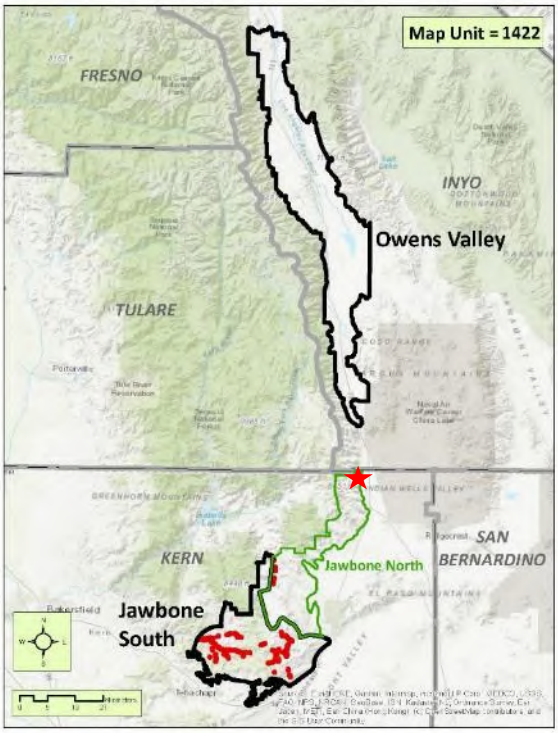
**DESCRIPTION:** The shrublands in this Alliance are characterized by the dominance of *Baccharis salicifolia,* which is usually more than 50 percent of the relative cover in the shrub layer. An emergent and sparse tree layer of willows or other species may also be present. The Alliance is found in large canyons and upper arroyos on alluvial fans, where it is adjacent to *Populus fremontii, Salix* spp, *Tamarix* spp., or other riparian stands. Where *Salix exigua* co-dominates, the stand is mapped to the *Salix exigua* Alliance. Where *Lepidospartum* squamatum co-dominates, the stand is considered the *Lepidospartum squamatum* Alliance.

**PHOTOINTERPRETATION SIGNATURE:** *Baccharis salicifolia* occurs in narrow bands in a wide range of cover along both the drier and more active portions of the stream channel. Stands with a dense cover tend to have a brownish to dark green color with a smooth texture. Sparser stands tend to have these same colors with a sparsely vegetated, very light-colored sandy to gravelly substrate. Individual crowns are small and poorly defined.

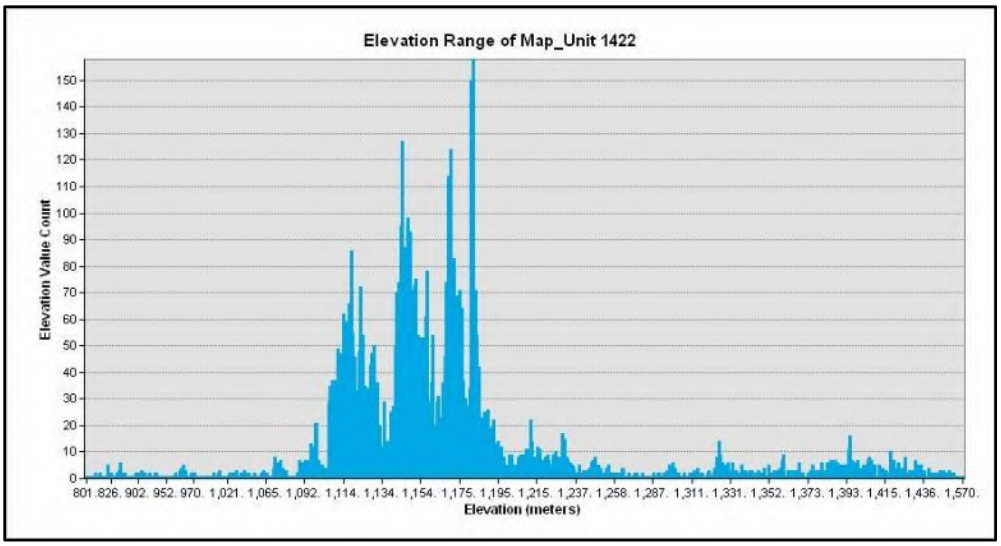
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Lepidospartum squamatum* Alliance (4212) – Both species occur as mixed stands or in close proximity to one another in Caliente Creek in the southern Sierra Nevada. Stands inter-finger with one another in a clustered mosaic alternating in dominance, making it difficult to determine relative cover dominance of each within a stand and harder to delineate dominant stands of each that are larger than the minimum mapping unit. *L. squamatum* has a shorter, more defined crown edge, but both may exhibit a brown to yellow brown color. Fluvial flooding events may alter the size and distribution patterns of these shrubs from year to year, making signatures between species difficult to identify. *L. squamatum* tolerates drier margins of major floodplains compared to *B. salicifolia*. When the two species co-dominate, the stand is considered the *Lepidospartum squamatum* Alliance.
- *Salix exigua* Alliance (1424) – Riparian stands in mid- and late-season phases will almost always have a blue-gray to blue-green signature color. Only the youngest stands will lack any blue tint to the color. Both types occupy similar settings and cover height and density characteristics overlap considerably.
- *Salix lasiolepis* Alliance (1427) – This species also occurs in or immediately adjacent to the streambed. In general, cover tends to be denser, and overall canopy is taller. In stands where cover is similar, the signature tends to be brighter green, but texture generally remains smooth throughout.
- *Tamarix* spp. Semi-natural Stands (1432) – Stands of *Tamarix* can occur in similar settings to *Baccharis salicifolia,* but overall the setting is less restrictive than the above two types. Cover characteristics also overlap and range from sparse to thicket-like, where density often exceeds 60 percent. Young tamarisk generally displays a brighter green signature; as the stand matures, the color becomes highly variable within the stand, ranging from dark brown to blue-gray. Crown shapes in younger stands are very similar to *Baccharis*. Mature stands are easily separable from *Baccharis*-dominated thickets.

***Baccharis salicifolia* Alliance (1422)**




**DISTRIBUTION:** The Alliance is found in arroyos adjacent to upper alluvial fans which emerge from the mountains at the westernmost edge of the DRECP; as well as the Mojave River. In the current study area, *Baccharis salicifolia* is mapped in the interior and desert foothills of the southern Sierra Nevada in the Jawbone North and South subareas. A smaller stand(s) in the northernmost region of Jawbone North is represented as a star.



## *Betula occidentalis* Alliance (1521)

Water birch thickets Alliance

*Betula occidentalis* occurs in this narrow riparian corridor as dense thickets of dark green shrubs, often mixing with *Salix lasiolepis*.

The bright green band of *Betula occidentalis* captured in the middle of this image occurs along the edges of a perennially flowing stream channel.

***Betula occidentalis* Alliance (1521)**

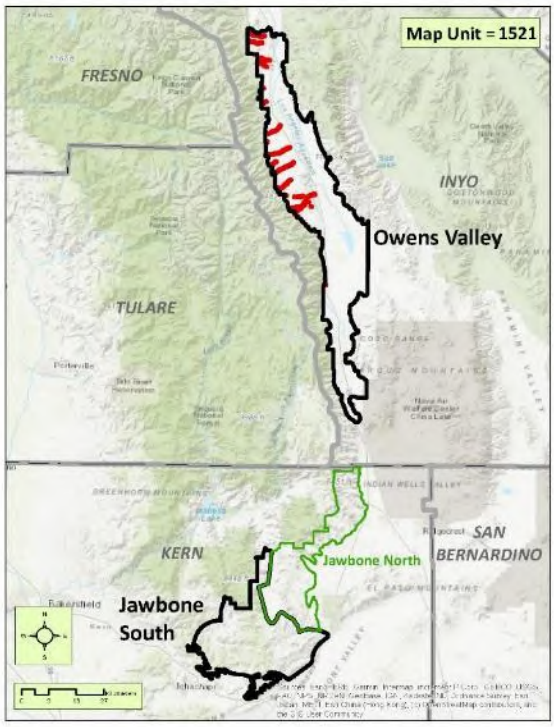
**DESCRIPTION:** *Betula occidentalis* dominates or co-dominates with *Salix* spp. In the DRECP region, stands occur along the west side of the Owens Valley. Stands in the mapping area are usually found in thickets strongly dominated by *Betula occidentalis.* Larger stands may occasionally contain emergent *Populus trichocarpa.*

**PHOTOINTERPRETATION SIGNATURE:** *Betula occidentalis* yields a fairly uniform very dark low intensity green color. The modal signature is interrupted infrequently, usually in water diversion efforts or small burns. Stands are fairly narrow and linear and can occur in continuous cover for at times over a mile. Texture is smooth to moderately clumpy, especially when taller emergent trees occur in the stand.

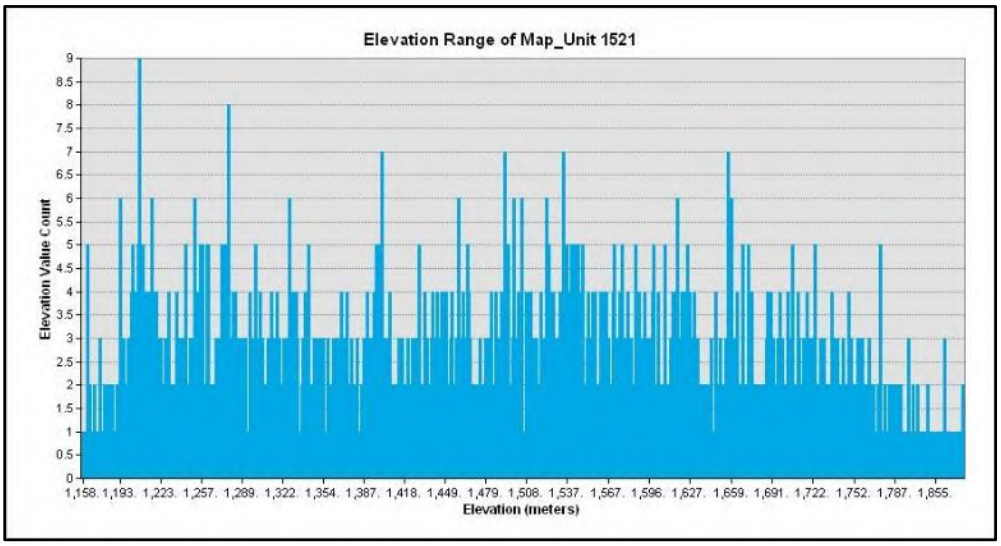
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Populus trichocarpa* Alliance (1512) – This species is at times an emergent to birch thickets. When tree cover is over 10% and consistent across the stand, it is considered the *Populus trichocarpa* Alliance.
- *Salix exigua* Alliance (1424) – Stands rarely mix, but where they do, such as in disturbance areas or toward the lower elevations, there is a mixing of the typical signature characteristics of *Betula occidentalis* and a gray and smoother texture patterning within the stand. These grayish colors can also be caused by die off of birch so it is important to note disturbance in the area.
- *Salix lasiolepis* Alliance (1427) – Stands dominated by this shrubby willow species can occur nearby where the linear wetland broadens into a more complex thicket. In these settings, it can be difficult to differentiate the two Alliances apart. Usually in these settings, the willow species occurs in deeper soil flats adjacent to the swift running stream where the birch dominates.

***Betula occidentalis* Alliance (1521)**




**DISTRIBUTION:** In the current study area, *Betula occidentalis* is mapped along the western tributaries of the Owens River of the Owens Valley subarea, in about a dozen seasonally flooded to perennial flowing streams. Best developed stands occur along Birch, Taboose, Tinemaha and Independence Creeks in the northern Owens Valley in addition to smaller stands to the south in Lone Pine, Tuttle, and Shepard Creeks. Small stands are rare in similar settings south of the Owens Valley.



## *Ceanothus cordulatus – Ceanothus integerrimus* Alliance (3212)

Mountain whitethorn – Deer brush chaparral Alliance

The aerial photo highlights a dense stand of dominant *Ceanothus integerrimus* in a protected north facing stand adjacent to a *Quercus kelloggii* stand.

This photo shows a dense stand of *Ceanothus integerrimus* in flower.

***Ceanothus cordulatus – Ceanothus integerrimus* Alliance (3212)**

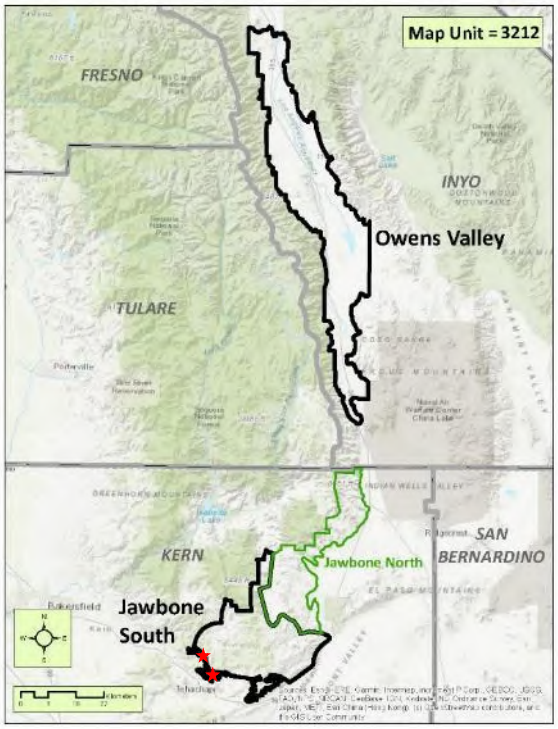
**DESCRIPTION:** *Ceanothus integerrimus* dominates or co-dominates the shrub canopy with *Arctostaphylos* spp. Stands occur on cooler more protected slopes and mix with a variety of other mesic chaparral species. It is a deciduous ceanothus, and is not sclerophyllous. *C. integerrimus* occurs at high elevations in post fire settings adjacent to stands of *Quercus kelloggii* that may have burned. It can also be found in proximity to Quercus garryana, and can edge montane types and premontane chaparral.

**PHOTOINTERPRETATION SIGNATURE:** *Ceanothus integerrimus* stands are dull dark gray or gray green in color and usually are moderately to very dense in cover on mesic slopes.

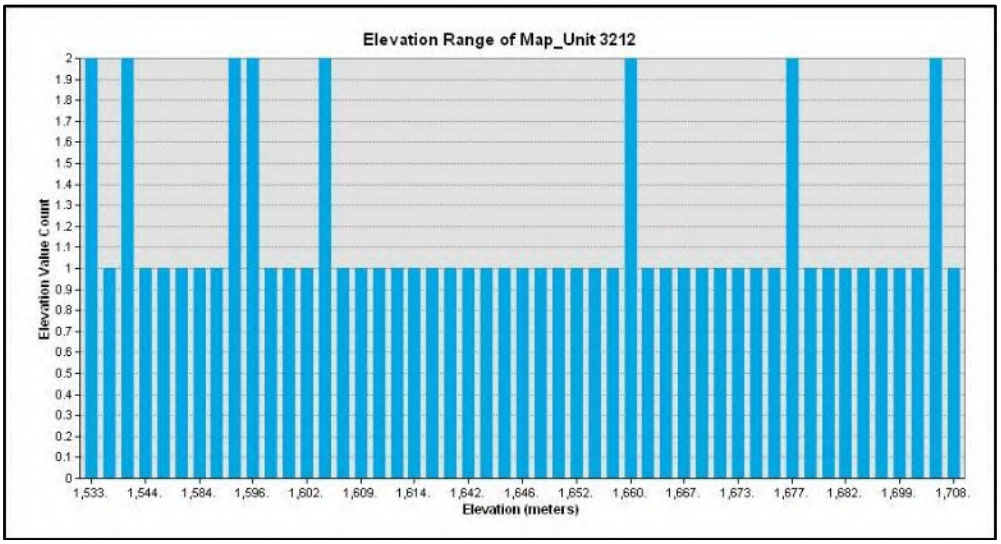
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Ceanothus cuneatus* Alliance (2116) – Stands of this Alliance have a lighter gray color with a rounded and smooth textured crown. *C. cuneatus* has a broader distribution and can occur on more xeric slopes than *C. integerrimus*. *C. cuneatus* is found at lower elevations than *C. integerrimus*, and is not deciduous.
- *Ceanothus oliganthus – Ceanothus leucodermis* Alliance (2123) – Stands appear dark gray with a fuzzy, undefined crown edge and smooth crown texture, especially when dense. Not only does both *C. leucodermis* and *C. integerrimus* look very similar, they also occur on more protected mesic slopes, therefore making signature differentiation very difficult. Environmental modelling is used to differentiate these two alliances.

***Ceanothus cordulatus – Ceanothus integerrimus* Alliance (3212)**




**DISTRIBUTION:** In the current study area, *Ceanothus integerrimus* is mapped at five sites (general locations represented as stars) within the interior southern Sierra Nevada.



## *Ceanothus greggii – Fremontodendron californicum* Alliance (3316)

Cup-leaf ceanothus – Flannelbush scrub Alliance


In this image, *Fremontodendron californicum* is a tall emergent shrub over a relatively dense cover of *Eriogonum fasciculatum.* Note: This screenshot is a portion of a larger polygon whose boundaries are not shown.

In this example, *Fremontodendron californicum* is the tall emergent shrub widely scattered here on a broad, fairly rocky sheet wash. *Eriogonum fasciculatum, Encelia actoni,* and *Hesperoyucca whipplei* are visible in the lower right portions of the photo over a fairly dense grassy herbaceous layer.

**3316 – *Ceanothus greggii – Fremontodendron californica* Alliance**

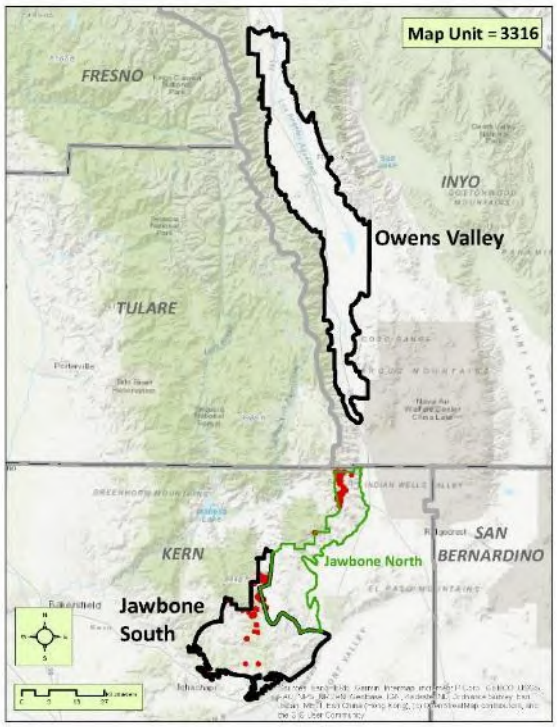
**DESCRIPTION:** In this Alliance stands are dominated by the tall shrub *Fremontodendron californicum* and/or *Ceanothus greggii,* with a mixture of desert chaparral and shorter shrubs including *Purshia tridentata, Hesperoyucca whipplei, Eriodictyon trichocalyx, Eriogonum fasciculatum, Ceanothus cuneatus, 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. They are often adjacent to *Quercus john-tuckeri, Adenostoma fasciculatum, Pinus monophylla* and *Yucca brevifolia* stands, or recent burns with *Encelia actoni* and *Eriogonum fasciculatum*. Most mapping of this Alliance in the DRECP is *Fremontodendron*, although *Ceanothus greggii* stands are limited to the highest elevations of the Piute Mountains above 5000'.

**PHOTOINTERPRETATION SIGNATURE:** Stands are often found in older post fire settings and always have a multiple canopy of taller shrubs over a fairly dense understory shrub layer averaging less than a meter in height. Overall cover of emergent *Fremontodendron californicum* varies considerably across the stand. However, signature characteristics of the individual shrubs tend to remain constant throughout the stand and generally have a well-defined, rounded, dark green crown. *Ceanothus greggii* occupies the higher elevations of the study area and appear as a dark gray, medium-sized shrub with a rounded well-defined crown margin. Stands are usually higher in cover and contain a diverse suite of chaparral species, such as *Artemisia tridentata, Ericameria nauseosa, Cercocarpus montanus*, and *Arctostaphylos glauca*, which complicate the signature recognition of these species.

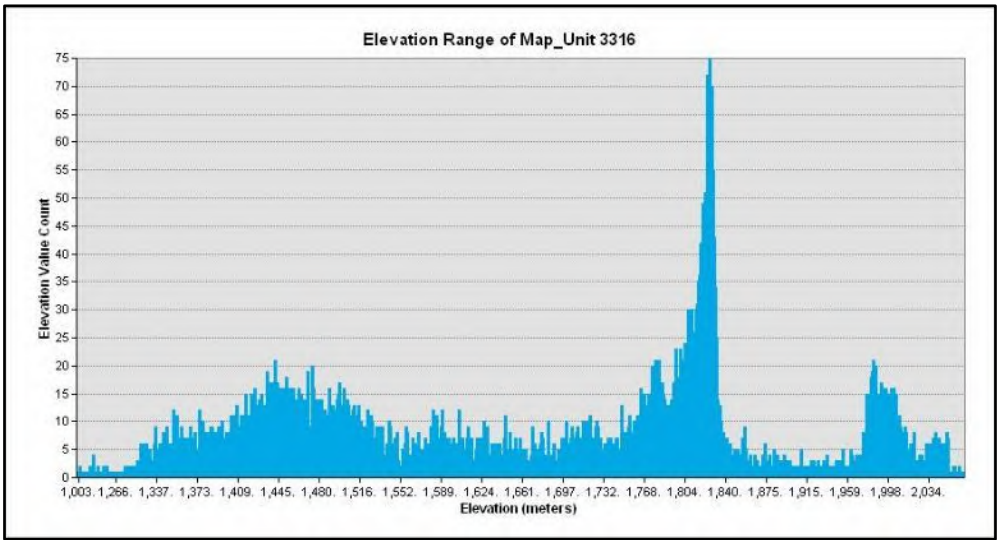
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Ceanothus cuneatus* Alliance (2116) – *Ceanothus cuneatus* stands occur in the mid elevations just downslope from *C. greggii*, which begins to establish stands at about 5000 feet in elevation. Both plants share many similarities in color, texture, plant structure, and setting, therefore complicating identification in the field and on the imagery. Transitions between these two types are modelled by elevation and also mapped using ground data.
- *Eriogonum fasciculatum – Viguiera parishii* Alliance (2221) – *Eriogonum fasciculatum* is often found adjacent to and as an understory component to *Fremontodendron californicum.* Individual shrubs are significantly smaller and difficulties in separating the two Alliances are based on relative cover of the two species. When *E. fasciculatum* is more than about two times the relative cover of the emergent *F. californicum*, the stand is mapped as the *Eriogonum fasciculatum* Alliance.
- *Purshia tridentata – Artemisia tridentata* Alliance (5422) – This Alliance can be found in similar settings, frequently establishing after older burns. Overall, stands of this Alliance are a bit closer to the desert margins on similar topographic settings to *F. californicum.* Shrubs tend to be smaller and overall are a lighter green. Cover characteristics are similar to those of *F. californicum* with a wide range of variability across the stand. Like *Fremontodendron,* stands of *Purshia tridentata* also tend to have a dense low shrub understory layer.

***Ceanothus greggii – Fremontodendron californica* Alliance (3316)**




**DISTRIBUTION:** In the current study area, this Alliance is mapped in the highest elevations of the Piute Mountains (*Ceanothus greggii*,) and along the Piute Mountains and the interior hills and desert foothill of the southern Sierra Nevada by Kelso Valley (*Fremontodendron californicum*) of the Jawbone South subarea.



## *Ceanothus oliganthus – Ceanothus leucodermis* Alliance (2123)

Hairy leaf ceanothus – Chaparral whitethorn Alliance


In this example at the edge of the study area, *Ceanothus leucodermis* strongly dominates the shrub layer in a dense post burn setting immediately adjacent to stands of older, more decadent *Adenostoma fasciculatum.*

The stand depicted on this photo is strongly dominated by *Ceanothus leucodermis* with the dead remains of *Quercus wislizeni* in a post burn setting as a result of a 2004 fire.

***Ceanothus oliganthus* – *Ceanothus leucodermis* Alliance (2123)**

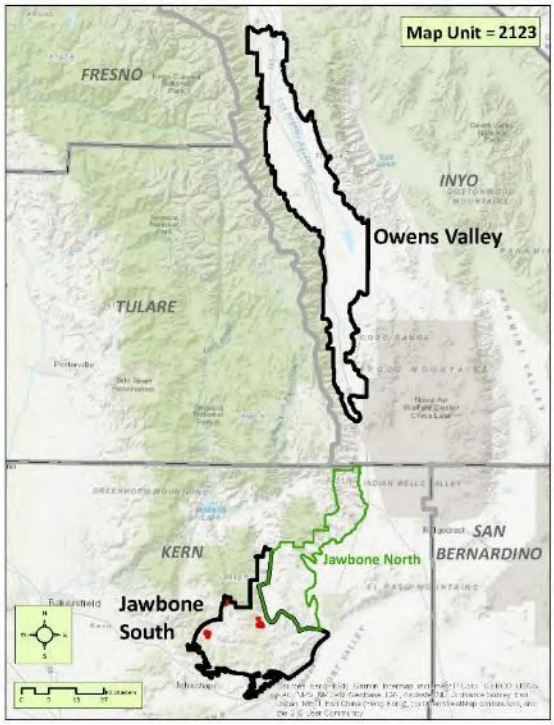
**DESCRIPTION:** In this Alliance, *Ceanothus leucodermis* characterizes the shrub canopy as a dominant or co-dominant (*C. oliganthus* is not mapped in the area). There is no consistent canopy tree overstory, but top-killed stems of short resprouts of *Quercus wislizeni* may be present. Stands are found primarily on north-facing slopes only in recently burned areas at mid to upper elevations. It is a common post fire regeneration type in former *Quercus wislizeni* stands. Stands also are found adjacent to *Quercus lobata* as well.

**PHOTOINTERPRETATION SIGNATURE:** Stands dominated by *Ceanothus leucodermis* tend to have a dense shrub cover with an overall monotypic signature. Young post fire stands tend to be a fairly bright green while older stands are a more glaucous-like blue-green. Individual crowns are not well defined and blend together, creating a smooth texture across the landscape.

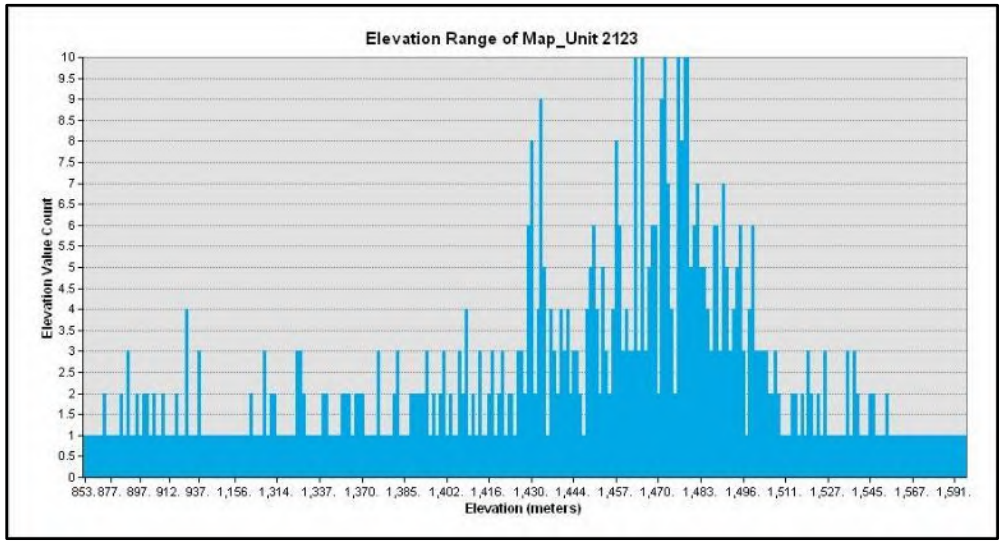
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Ceanothus cuneatus* Alliance (2116) – Individuals of this Alliance have a moderately-sized rounded gray signature that resembles *C. leucodermis*. The primary difference between the two species is that *C .leucodermis* is more restricted to north faces, whereas *C. cuneatus* can be found on all aspects at mid to upper elevations and has a well-defined crown margin.
- *Cercocarpus montanus* Alliance (2131) – This Alliance has a very similar gray to gray-green color and can re-sprout after fires, similar to *Ceanothus leucodermis*. The two species differ in that *Cercocarpus montanus* does not establish as dense of a canopy and tends to occur on more xeric aspects, not only on north faces like *Ceanothus leucodermis* prefers.

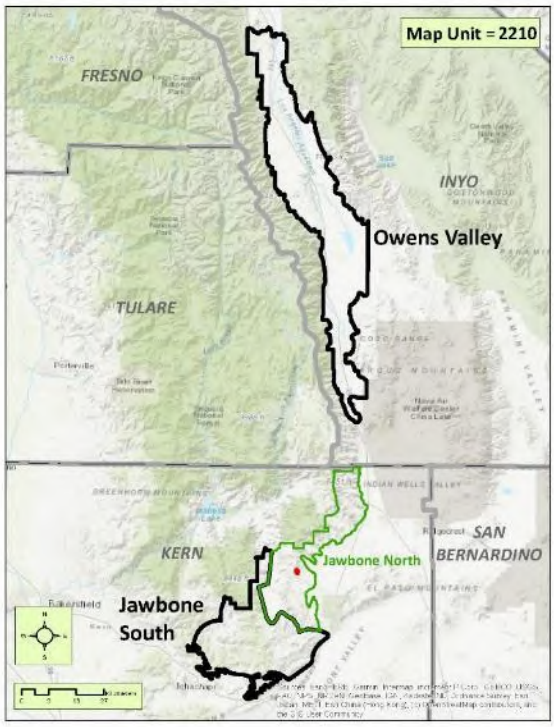
***Ceanothus oliganthus* – *Ceanothus leucodermis* Alliance (2123)**



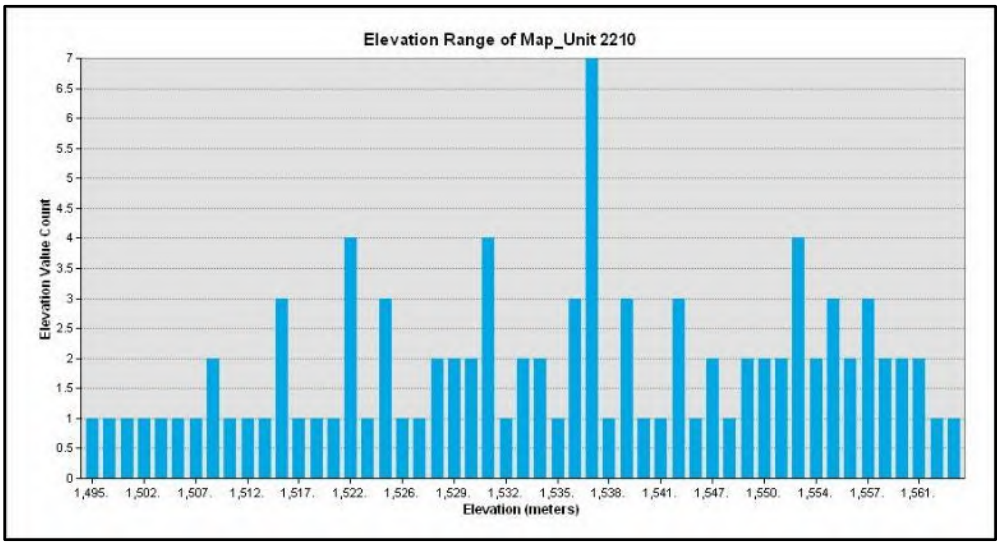

**DISTRIBUTION:** In the current study area, *Ceanothus leucodermis* is mapped at a few sites in the interior southern Sierra Nevada of the Jawbone South subarea.



## Central and south coastal California seral scrub Group (2210)

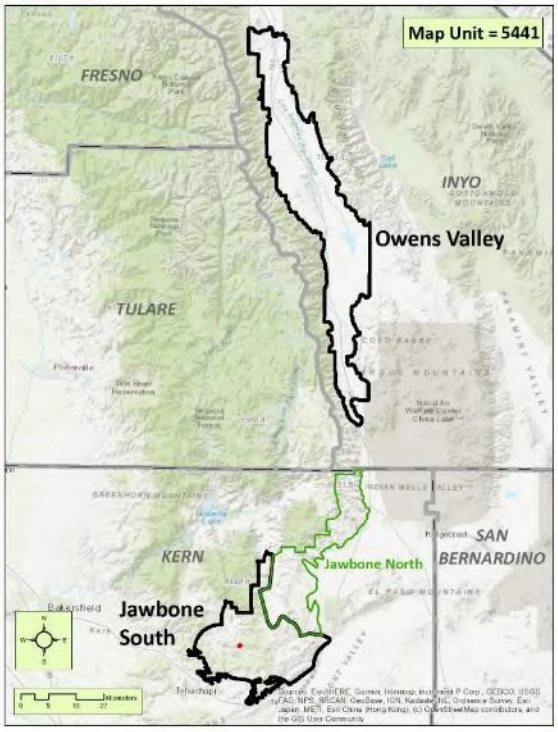



**DISTRIBUTION:** One stand of this Group was mapped in the Jawbone North subarea in the desert foothills of the southern Sierra Nevada. This stand was mapped at the Group level because the Alliance was not discernible from the imagery. The polygon was not verified or visited in the field. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.

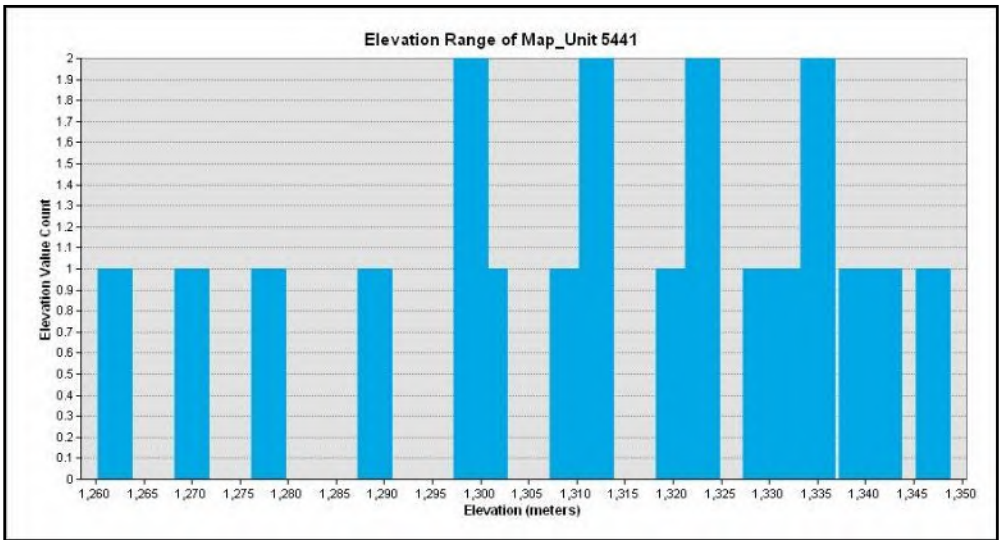


## *Cercocarpus ledifolius* Alliance (5441)

Curl leaf mountain mahogany scrub Alliance




**DISTRIBUTION:** Stands of this Alliance were infrequently mapped in the study area. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project. One polygon in the Jawbone South subarea was mapped from field data.



## *Cercocarpus montanus* Alliance (2131)

Birchleaf mountain mahogany Alliance

In this desert edge setting, *Cercocarpus montanus* is found in a post burn regeneration area on slightly steeper north-trending slopes adjacent to open stands of *Adenostoma fasciculatum.*

This stand is located in a California mesic chaparral setting on a steep north-facing slope. *Cercocarpus montanus* co-dominates here with *Ceanothus crassifolius* and some *Prunus ilicifolia.* Along the ridgeline, the shrubland changes to a more xeric community dominated by *Adenostoma fasciculatum.*

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***Cercocarpus montanus* Alliance (2313)**

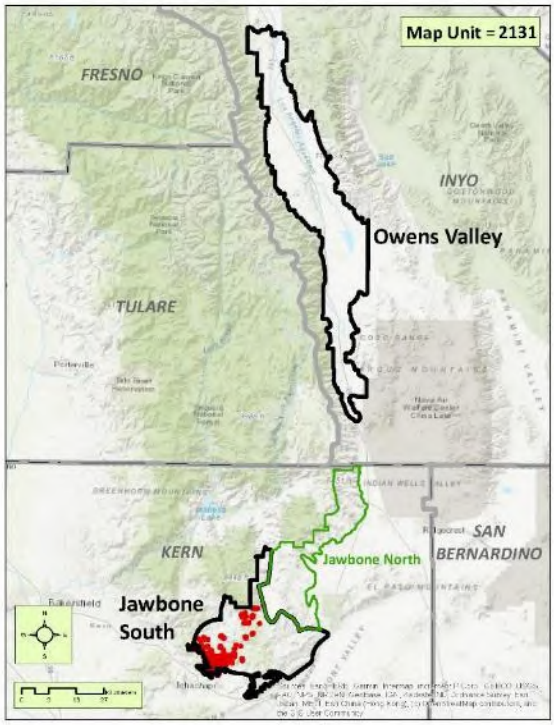
**DESCRIPTION:** In this Alliance, *Cercocarpus montanus* has more than 30 percent relative in the shrub canopy. *C. montanus* may have similar relative cover as *Arctostaphylos glauca, Adenostoma fasciculatum, Artemisia tridentata spp. tridentata, Ceanothus* spp., *Quercus john-tuckeri,* and *Eriogonum fasciculatum*. Stands are found extreme west of the DRECP, and in the Transverse Ranges and the southern Sierra Nevada. Where *Cercocarpus montanus* co-dominates with *Arctostaphylos viscida*, *Quercus john-tuckeri*, or *Ceanothus cuneatus*, then the stand is mapped to the *Cercocarpus montanus* Alliance.

**PHOTOINTERPRETATION SIGNATURE:** Within the study area, *Cercocarpus montanus* is found in two distinct settings: (1) Toward the desert margins on north slopes, frequently in a post fire setting where tall shrubs are emergent over a dense annual grass cover. In this environment, *C. montanus* individuals are significantly darker brown than adjacent slopes of *Adenostoma fasciculatum.* Less than one mile to the north, high desert stands of *Yucca brevifolia* over desert shrubs such as *Salazaria mexicana* dominate the landscape. (2) In the Transverse Ranges and the southern Sierra Nevada, in a more typical mesic chaparral environment on steep northerly protected slopes. Shrub cover on these examples is dense except in the steepest, rockiest area, and *C. montanus* often shares dominance with other mesic chaparral species such as *Quercus john-tuckeri, Arctostaphylos viscida, Ceanothus cuneatus*, *Prunus ilicifolia, Ceanothus crassifolius* and *Quercus berberidifolia.* In this setting, overall signature color is a dark green, texture is variable, and shadowing occurs over the steeper portions of the stand.

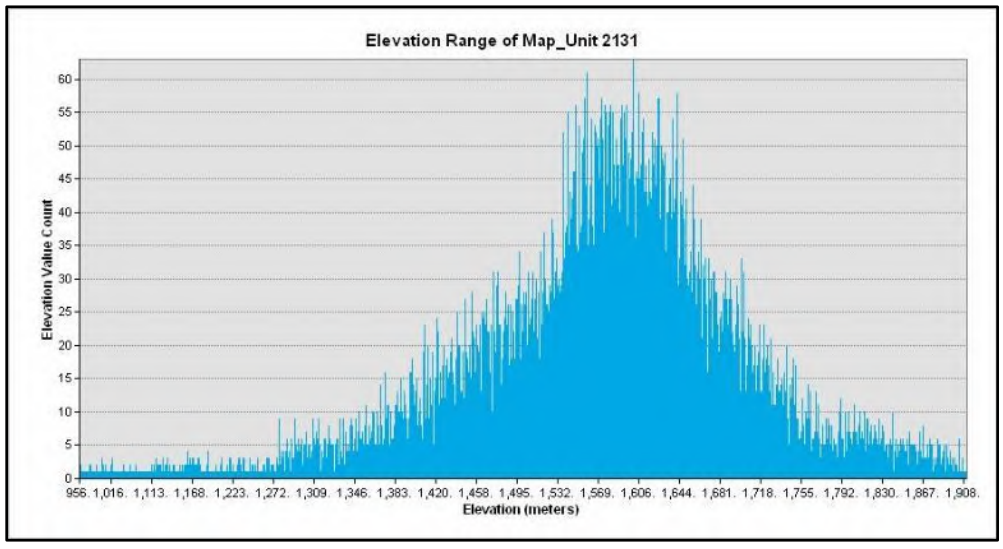
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Ceanothus cuneatus* Alliance (2116) – *C. cuneatus* often comprises a diverse mixture of dense semi-mesic chaparral stands, where individual species signatures are difficult to discern from one another. Open grassy stands on steeper slopes can also be difficult to separate out from xeric stands of *Cercocarpus montanus.* Both species are medium-sized, gray, and often mix. Color-infrared imagery sometimes reveals *Cercocarpus montanus* as a lighter pink reflectance than the slightly shorter, duller gray *Ceanothus cuneatus* signature.
- *Quercus john-tuckeri* Alliance (3312) – This Alliance overlaps in a transitional area *with C. montanus* in a mid to upper elevation zone (3000-5000') in the Piute Mountains. *Q. john-tuckeri* displays a dense, dark gray crown with a flat-topped texture, in contrast with the narrower, wispier crown of *C. montanus*. Difficulties in the differentiation of these species occur when they intermix in variable cover stands that overlap where steeper rockier slopes meet more gradual, grassier slopes.

***Cercocarpus montanus* Alliance (2131)**



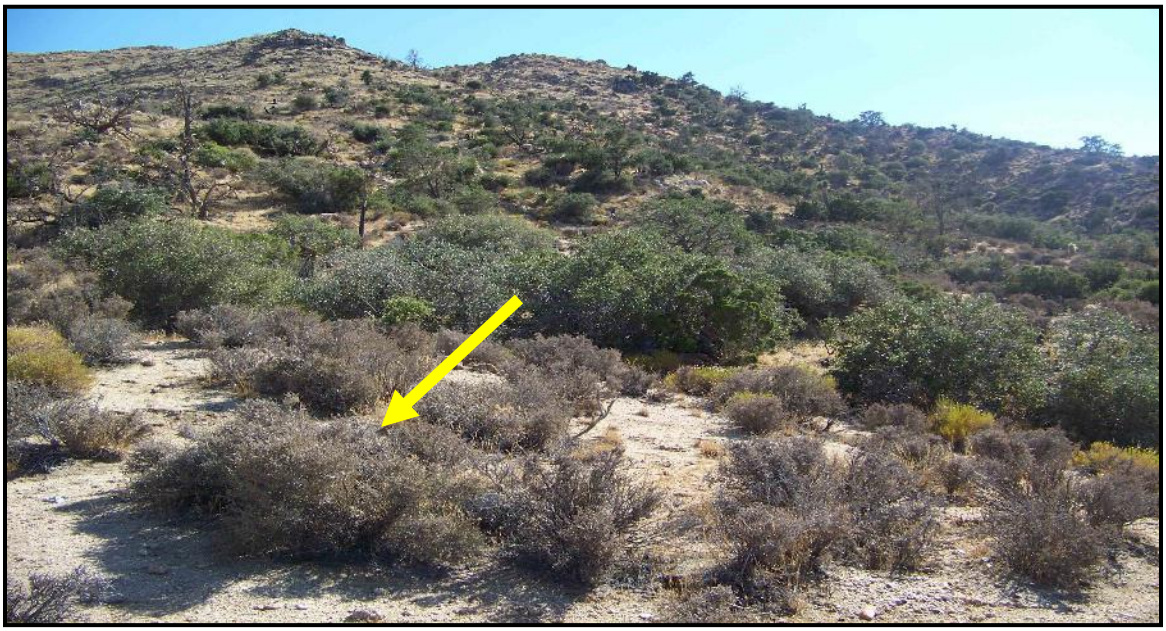

**DISTRIBUTION:** This Alliance is found in the mountains on the western edge of the DRECP. In the current study area, *Cercocarpus montanus* is mapped in the interior southern Sierra Nevada of the Jawbone South subarea.



## *Coleogyne ramosissima* Alliance (5421)

Black brush scrub Alliance

This image depicts a stand strongly dominated by *Coleogyne ramosissima,* with several emergent *Juniperus californica* and *Yucca brevifolia* individuals widely scattered throughout.



*Coleogyne ramosissima* is seen in the foreground here as the darker-colored short shrub. The darker appearance is indicative of its common name, black brush scrub. Herbaceous understory, as depicted on this photo, is typically sparse.

***Coleogyne ramosissima* Alliance (5421)**

**DESCRIPTION:** In stands of this Alliance *Coleogyne ramosissima* is the dominant or co-dominant shrub, typically with no species of taller shrub greater than 33 percent of the total relative cover of *Coleogyne*, though other smaller shrubs such as *Ephedra nevadensis* and *Eriogonum fasciculatum* may be of equal or greater cover. Although *Coleogyne* typically dominates stands, its cover may be exceeded by disturbance-related species such as *Ambrosia salsola, Salazaria mexicana, Ericameria* spp., or *Eriogonum fasciculatum*. If *Yucca schidigera* is present with *C. ramosissima,* the *Coleogyne* needs to be more than three times the cover of *Y. schidigera* for the stand to be in the *Coleogyne ramosissima* Alliance. *C. ramosissima* is generally upslope from *Larrea tridentata – Ambrosia dumosa* on shallow rocky soils of upper bajadas, pediments, and hill slopes. It does not prefer steep colluvial deposits with larger rocks and boulders. Because *C. ramosissima* is extremely susceptible to fire (even low-intensity), many thousands of acres of it have now converted to *Grayia, Salazaria, Ericameria,* and *Ambrosia* types. *Corethrogyne* co-dominating with *Purshia tridentata* or *Ericameria teretifolia* are considered as the *Corethrogyne ramosissima* Alliance.

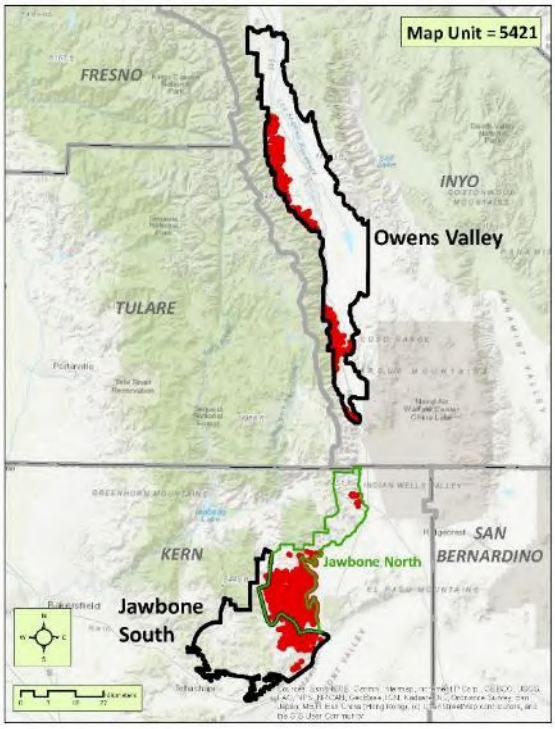
**PHOTOINTERPRETATION SIGNATURE:** The most characteristic quality of the *Coleogyne ramosissima* Alliance is the very dark shrub layer contrasting vividly with the much lighter pediment-like substrate. Cover density is usually consistent across the stand with very little clumping, and shrubs vary minimally in size. Individual shrubs have a well-defined, generally rounded crown. Larger stands tend to have a fairly low diversity of shrub species, and therefore overall signature is consistent across much of the stand.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

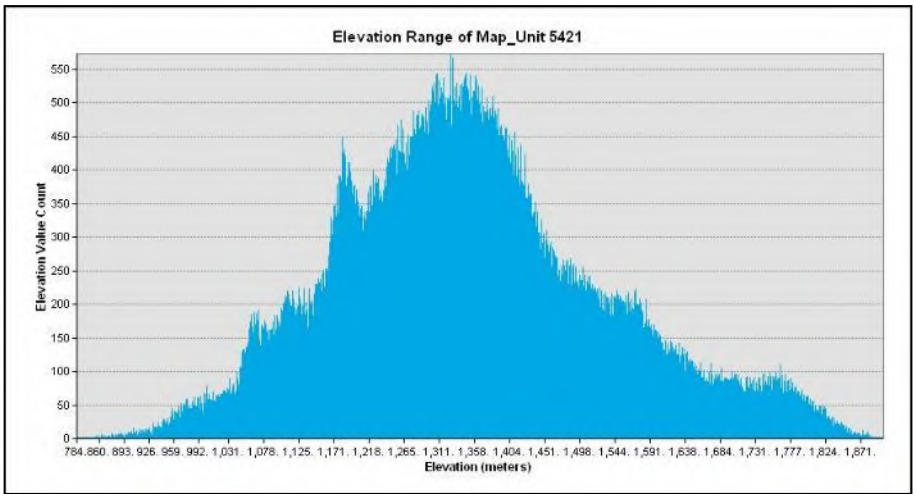
- *Ambrosia dumosa* Alliance (4111) – Stands where *Ambrosia dumosa* dominate the shrub layer tend to have a significantly lighter gray color to the vegetative component. Conversely, the substrate is not as vivid a white, making the distinction between vegetative and nonvegetative layers less apparent. Individual shrubs are slightly smaller and crowns less distinct. This type is less likely to be found on pediment surfaces and is more common at lower elevations.
- *Eriogonum fasciculatum – Viguiera parishii* Alliance (2221) – Overlap between these two types is infrequent but may occur along the southern Sierra Nevada foothills and slopes of desert mountain ranges. In the southern Sierra foothills, *E. fasciculatum* generally will occur adjacent to stands of *Coleogyne ramosissima* upslope on steeper terrain. Shrubs are typically smaller and tend to be lighter brown.
- *Grayia spinosa* Sub-alliance of the *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419) – *Grayia spinosa* can also occur on fairly light-colored substrate but does not often occur on thin-soiled pediment, and therefore usually has a much higher herbaceous layer. This herbaceous layer generally makes the understory signature tone not as vivid a white. Individual shrubs are slightly larger; crowns are not as well defined, and not quite as dark a color. Both types are often mapped in near to completely dormant phases and yield little in the way of green hues.

- *Larrea tridentata – Ambrosia dumosa* Alliance (4115) – Higher elevation stands often mix with a high diversity of understory shrubs including *C. ramosissima.* Substrate characteristics help to separate out areas where *C. ramosissima* dominates. As mentioned above, *Coleogyne* tends to occur on lighter caliche-layered substrate.

***Coleogyne ramosissima* Alliance (5421)**




**DISTRIBUTION:** *Coleogyne ramosissima* is extensively mapped in five regions DRECP area: (1) along the base of the Sierra Nevada on sparse pediments in the southern Indian Wells Valley; (2) along the base of the San Bernardino Mountains and little San Bernardino Mountains above Lucerne Valley and Yucca Valley; (3) in the Ord Mountains; (4) adjacent to Naval Air Weapons Station China Lake, and (5) in the Eastern Mojave Desert region throughout Shadow Valley. In the current study area, *Coleogyne ramosissima* is mapped extensively in the desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas, most notably between Bird Spring Canyon and Water Canyon; and along the upper alluvial fan on the western side of the Owens Valley subarea, as well as east of Haiwee Reservoir.



## *Cornus sericea – Rosa woodsii – Ribes spp.* Alliance (1522)

Red osier – Interior rose – Gooseberry thickets Alliance

This screen shot highlights the dull green clonal patches of *Rosa woodsii* extending along the margin of a stream terrace surrounded by a larger stand of *Ericameria nauseosa*.

This photo depicts a clonal patch of pink flowering *Rosa woodsii* in the foreground along a riparian terrace. Emergent *Salix laevigata* occurs in the background running along the banks of a perennial stream.

***Cornus sericea – Rosa woodsii – Ribes spp.* Alliance (1522)**

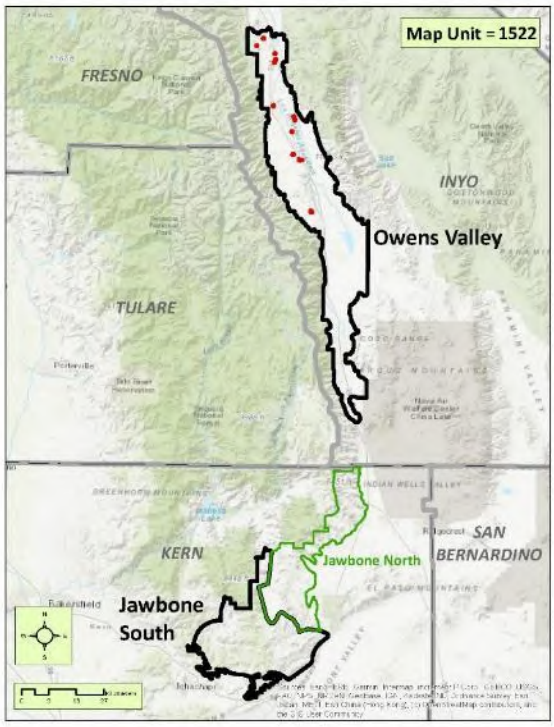
**DESCRIPTION:** *Rosa woodsii* is the dominant shrub in the canopy, often in thickets adjacent to other riparian shrubland stands such as *Salix exigua* or *Ericameria nauseosa*. Found generally west of the Owens River along the margins of more alkaline soils where fresh water is locally prevalent.

**PHOTOINTERPRETATION SIGNATURE:** *Rosa woodsii* is found in patchy irregular patterns, generally under 5 acres in size. Colors vary from dark green to dark brown depending on the phonological characteristics of the stand. In the Owens Valley, stands frequently occur in close proximity to alkaline types and where man-made ditches leak water creating wetland complexes downslope. In these latter cases, stands are found along the margins of high desert or Great Basin vegetation.

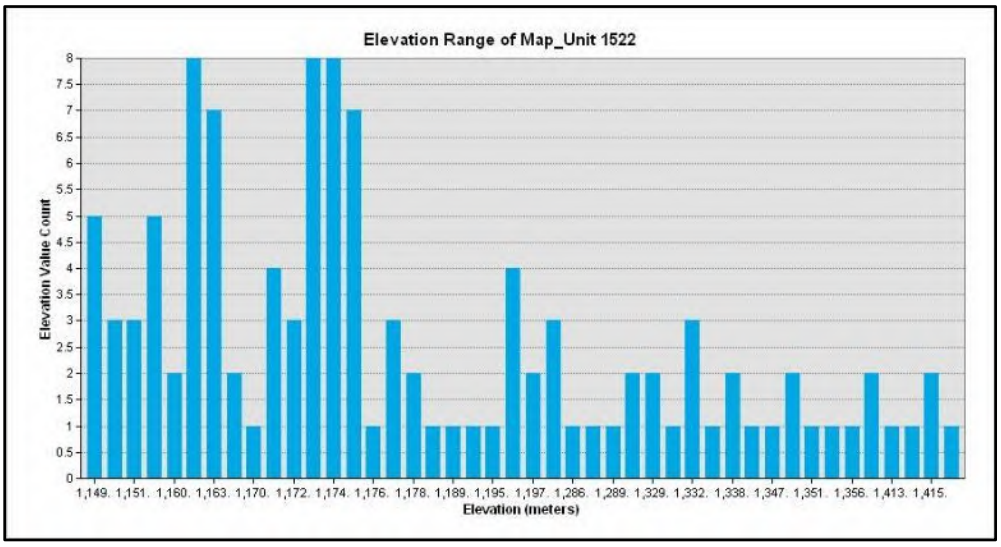
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Salix exigua* Alliance (1424) – *Salix exigua* is generally more blue-gray in color and typical patterning is somewhat more linear.
- *Rhus trilobata – Crataegus rivularis – Forestiera pubescens* Alliance (1425) – This Alliance is found on small elevated floodplains in temporarily flooded settings adjacent to riparian vegetation such as *Populus fremontii.* Texture is more stipple-like and less patchy than the *Rosa.* Stand edges in both types are well defined, but in the *Forestiera* stands, the margins are less clonal in appearance.
- *Vitus arizonica – Vitus girdiana* Alliance (1428) – Colors are a more uniform dark green with a smoother texture, and are found in a less patchy setting. Adjacent vegetation is never alkaline; generally occurring adjacent to higher elevation desert Alliances.

***Cornus sericea – Rosa woodsii – Ribes spp.*** **Alliance (1522)**

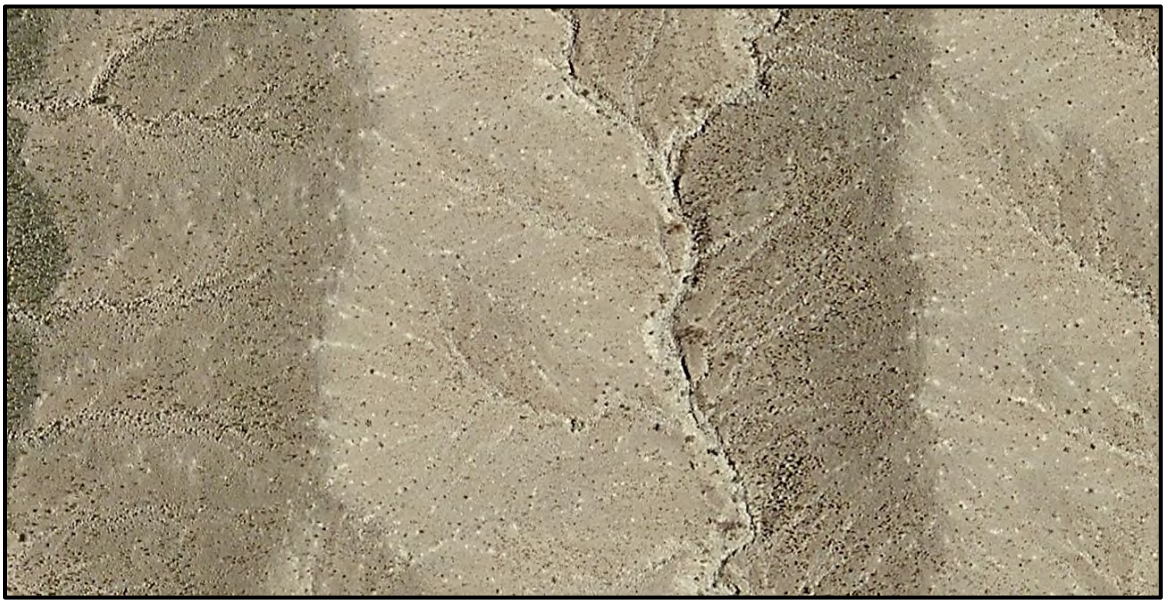



**DISTRIBUTION:** In the current study area, *Rosa woodsii* is mapped at the lower alluvial fan edge just above the Owens River floodplain of the Owens Valley subarea, often in wetland meadows, created by leaking ditches running parallel to the topography. Stands are infrequent and widely scattered in small patches off Lubken Canyon and Aberdeen Station Roads among others.



# *Cylindropuntia bigelovii* Alliance (4124)

Teddy bear cholla patches Alliance



The example depicts a stand of *Cylindropuntia bigelovii* where *C. bigelovii* dominates but is mixing with patchy *Larrea tridentata, Fouquieria splendens, Encelia farinosa* and *Ambrosia dumosa*. *Olneya tesota* is located in the wash. Note: This screenshot is a portion of a larger polygon whose boundaries are not shown.

The photo depicts a dense stand of *Cylindropuntia bigelovii* with small amounts of *Larrea tridentata* and *Fouquieria splendens.* The highly variable density typical of *Cylindropuntia bigelovii* is seen here.

***Cylindropuntia bigelovii* Alliance (4124)**

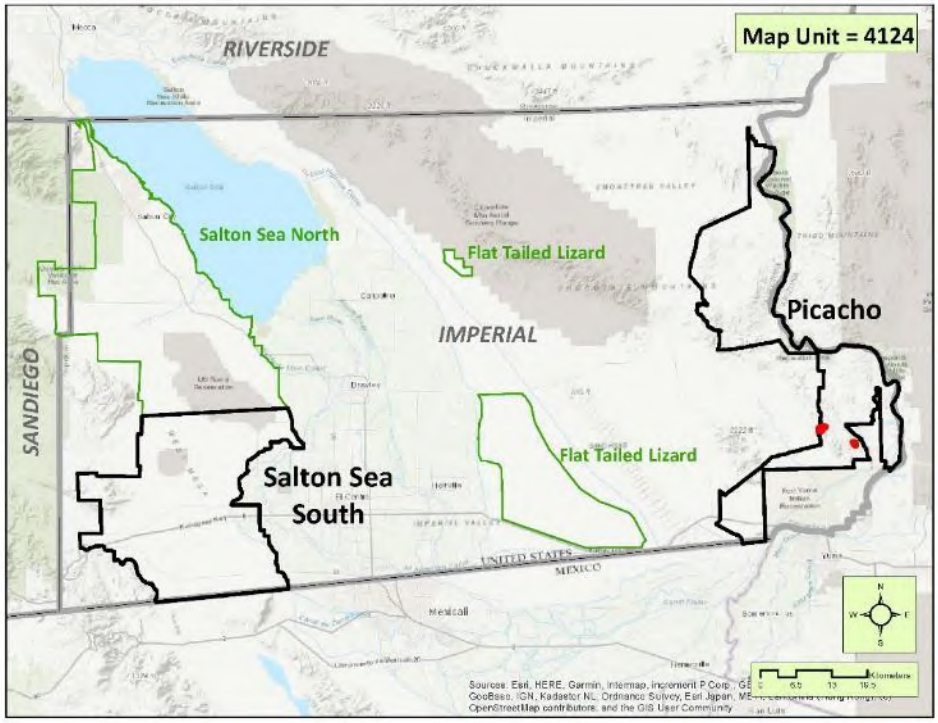
**DESCRIPTION:** *Cylindropuntia bigelovii or Cylindropuntia munzii* are distinctive, jointed cholla with a vertical trunk; the plant grows to 1.5 meters in height. Stands dominate the shrub layer with at least 50% relative cover. *Cylindropuntia* is typically co-dominant with *Encelia farinosa* in localized settings, with presence of *Fouquieria splendens* and at times *Larrea tridentata.* The Alliance is found on alluvial fan deposits and gentle to moderate slopes of rocky highlands. Soils consist of coarse sands to loams (Sawyer et al., 2009). Polygons mapped to this Alliance tend to vary considerably in density across the stand,

**PHOTOINTERPRETATION SIGNATURE:** Stands mapped to this Alliance closely resemble pavement surfaces containing large volcanic cobbles strewn about the landscape. However, reliable distinctions between the vegetated stands of *C. bigelovii* and unvegetated cobbly surfaces can be made based on the highly irregular cover variability of the cactus plants within a single stand. Individual plants yield a light tan to dark brown color (variable across the stand) and have a "swarm-like" distribution.

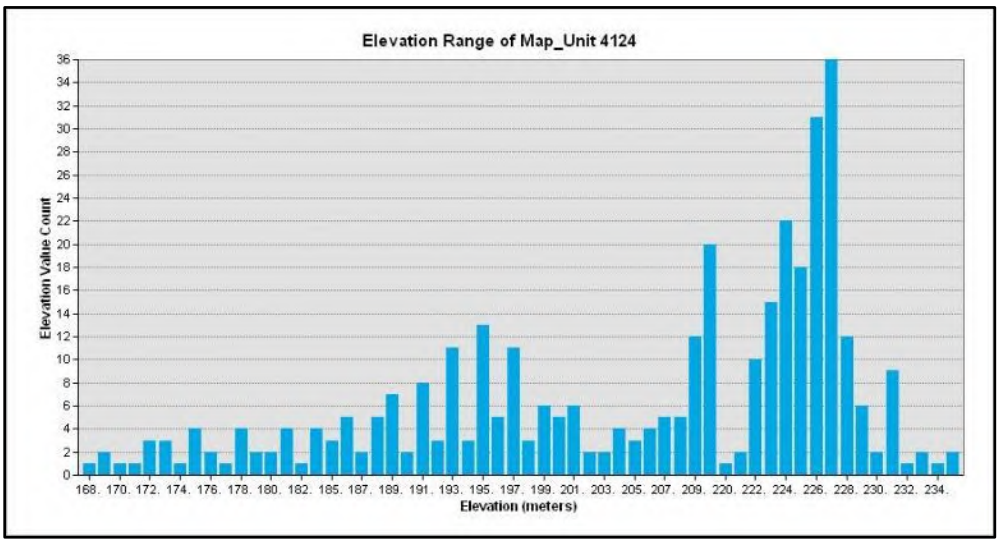
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Chorizanthe rigida – Geraea canescens* Desert pavement Sparsely Vegetated Alliance (6117) – The sparse vegetation and numerous large cobbles tend to be more consistently distributed across the pavement surface. The color of the cobbles is less variable than that of the similar-looking *Cylindropuntia bigelovii,* and on close inspection tends to be darker.
- *Encelia farinosa* Alliance (4114) – Both plants have small crowns, although *E. farinosa* averages slightly larger. Stands dominated by *E. farinosa* tend to occur on higher mountain slopes. Like *C. bigelovii,* cover is variable across the stand, but the patterning of *E. farinosa* is less swarm-like.

***Cylindropuntia bigelovii* Alliance (4124)**




**DISTRIBUTION:** Stands occur exclusively in the Chuckwalla and Chocolate Mountain areas. The best examples occur on upper fans and lower toe slopes on south-facing aspects in the Chuckwalla Mountains near the Chocolate Mountains Aerial Gunnery Range. Several stands span more than a thousand acres. In the current study area, three sites were mapped in the Picacho subarea in the Chocolate Mountains west of Imperial Dam.



## *Encelia (actoni, virginensis) – Viguiera reticulata* Alliance (5211)

Acton's encelia & Virgin River brittle brush – Net-veined goldeneye scrub Alliance


In this example, *Encelia* occurs on a steep southwest-facing slope north of State Route 138 in Cajon Canyon along the San Andreas Rift Zone. This stand had been recently burned and is shown in an early successional stage of revegetation.

*Encelia*, the shrub with the light gray/white colored leaf in the foreground, is seen here in a mixed stand with emergent *Yucca brevifolia* scattered in the background.

***Encelia (actoni, virginensis) – Viguiera reticulata* Alliance (5211)**

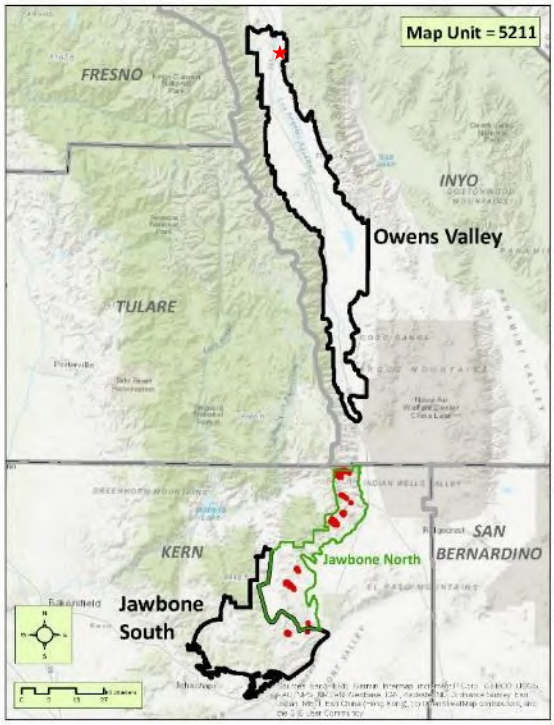
**DESCRIPTION:** In stands of this Alliance, *Encelia actoni, E. virginensis, and Viguiera reticulata* are dominant or co-dominant and comprise at least 2 percent of the cover, with no other shrub species having greater or equal cover. *Encelia actoni* was previously considered a subspecies of *Encelia virginensis.* The two share very similar ecological traits. *E. actoni* is the taxon most common in the study area. This Alliance typically occurs in washes or other disturbed areas (such as recently burned mid-elevation desert slopes) throughout the Mojave Desert. Where the Western Mojave borders the Transverse and Tehachapi Ranges, stands often occur on steep south-facing slopes associated with *Hesperoyucca whipplei* or *Eriogonum fasciculatum*. Stands may also have relatively high cover of *Achnatherum speciosum* and *Salazaria mexicana.*

**PHOTOINTERPRETATION SIGNATURE:** Stands range from sparse to moderately dense in cover. These small shrubs have a dull light gray to dark gray color with indistinct crown edges. The plants appear as small individuals varying in size and shape depending on their phase of post disturbance recovery. Recently burned slopes appear very open and sparse, with smaller regenerating crowns barely visible on imagery. In these situations, stand composition is typically mixed with a variety of other successional shrubs, and it may be difficult to identify *Encelia* from among the other shrubs at low cover.

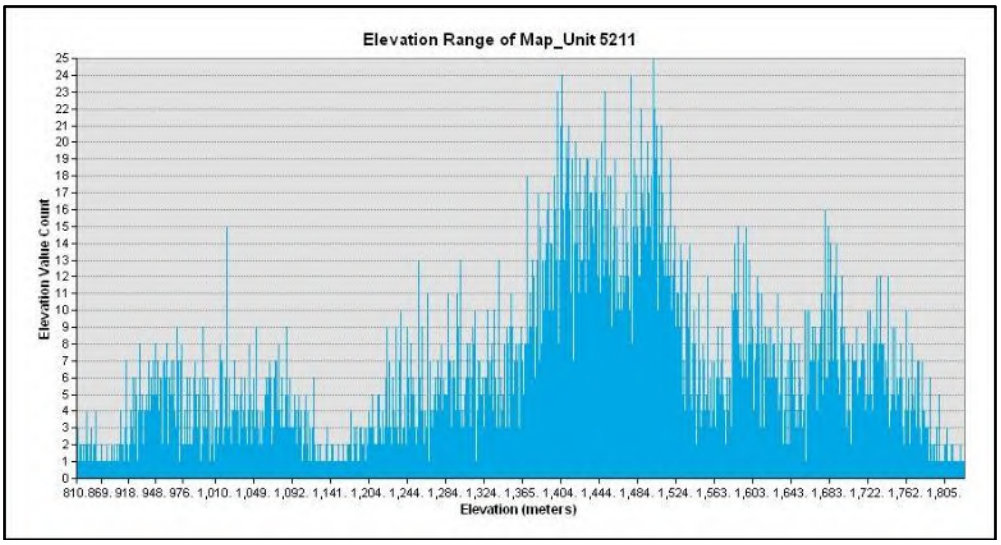
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Ambrosia dumosa* Alliance (4111) – *A. dumosa* tends to be closely associated with the presence of *Larrea tridentata* on lower elevation fans (below 3000 feet/920 meters). At higher elevations, the fans lack the presence of *L. tridentata* and will have more potential for *Encelia* or *Eriogonum fasciculatum* to occur.
- *Ambrosia salsola – Bebbia juncea* Alliance (7211) – The ranges of *Ambrosia salsola* and *Encelia* overlap on post burn fans and bajadas within the foothill zone, but *A. salsola* will be more restricted to the nearby washes.
- *Eriogonum fasciculatum – Viguiera parishii* Alliance (2221) – In the higher elevation desert hills and mountains (above 3000 feet/920 meters), *Eriogonum fasciculatum* and *Encelia* can co-occur. *E. fasciculatum* tends to be a little darker in color. Although both of these species are early seral colonizers, in areas of recent burns *Encelia* is more likely to occur, especially on the fans along the San Bernardino Mountains south of Lucerne Valley. *E. fasciculatum,* however, tends to occur in disturbances where the soil is disrupted, as with scrapes and road cuts.
- *Prunus fasciculata – Salazaria mexicana* Alliance (7212) – On desert mountain ranges in the southern Central Mojave stands dominated by *S. mexicana* were observed in post burn settings generally downslope from *Encelia* or upslope on rockier terrain. Plants can have more of a greenish blue color, and crowns may coalesce together into clumps within a stand. Individual crowns are generally somewhat larger.

***Encelia (actoni, virginensis) – Viguiera reticulata* Alliance (5211)**




**DISTRIBUTION:** The largest stands occur on recently burned upper elevation steep slopes in the southern mountains of the Central Mojave Desert. There are also scattered stands along burned slopes and fans coming off of the San Bernardino Mountains and the southern Sierra Nevada. In the current study area, *Encelia* is mapped along the desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas; and one polygon (represented as a star) is mapped on the eastern alluvial fan just east of Little Seeley Spring in the northern part of the Owens Valley subarea.



## *Encelia farinosa* Alliance (4114)

Brittle bush scrub Alliance


The *Encelia farinosa* Alliance occurs on hot, exposed, steep, rocky volcanic slopes. Note the small light-colored shrubs in this image. Note: This screenshot is a portion of a larger polygon whose boundaries are not shown.

The photo shows small, light-colored *Encelia farinosa* throughout this slope.

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

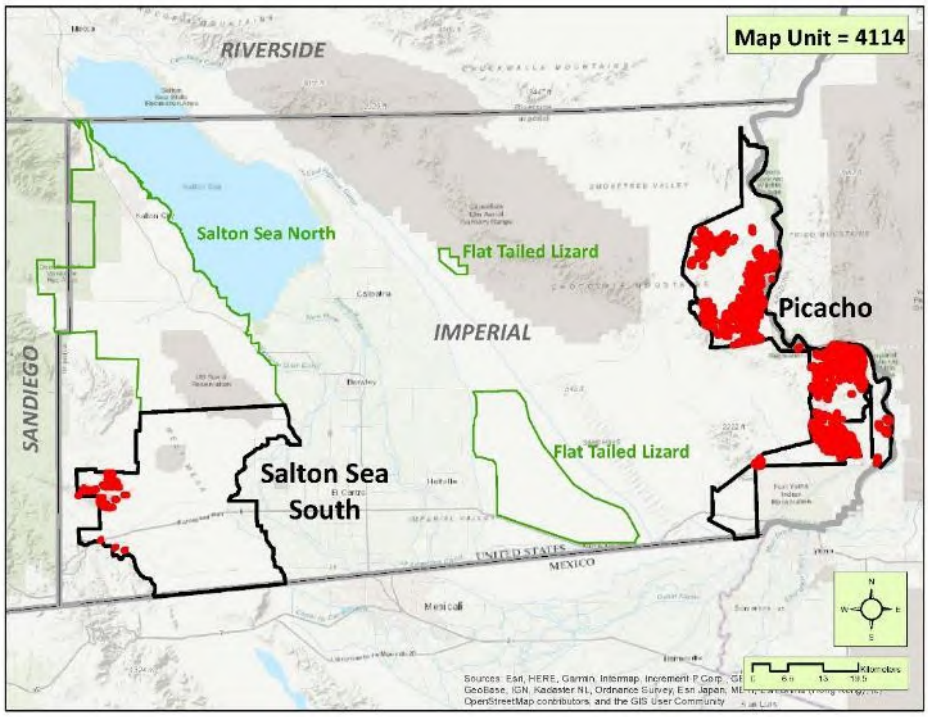
**PHOTOINTERPRETATION SIGNATURE:** Cover ranges from sparse to moderately dense and varies considerably as subtle characteristics of the topography change across the stand. Individual plants tend to be light gray and have a fairly well-defined crown. Darker substrate (metamorphic and desert pavement) 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). Further south, in the Colorado Desert, *Encelia farinosa* can be found on nearly all slope aspects, and distribution is more a factor of its preference for dark rock substrate and mountain terrain landforms.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

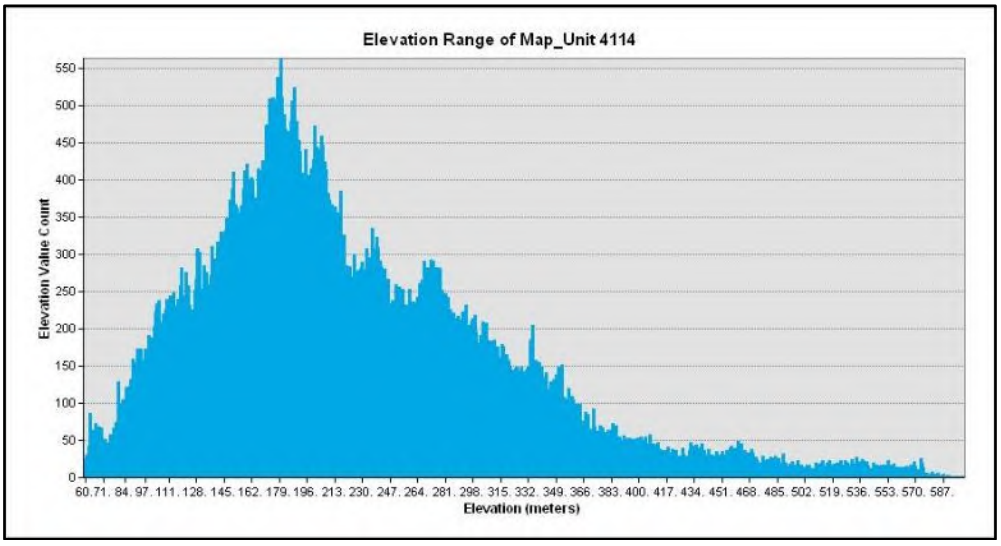
- *Ambrosia dumosa* Alliance (4111) – In the Colorado Desert, *Ambrosia dumosa* is more likely found on lower fans and bajadas upslope from playa soils and below the darker-colored pavements adjacent to nearby mountains. It is less likely to dominate the small rills that dissect desert pavement. At times, it can be found on steep, lighter-colored exposed slopes over marble and limestone substrate. In the Western and Central Mojave Desert regions, it is much more likely to occur with *Larrea tridentata* except in the Pinto Mountains, where either species may co-dominate. *A. dumosa* tends to have a smaller, less distinct crown and a slightly darker color.
- *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* Sub-alliance (5413) of the *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419) – In the Colorado Desert, this species may replace *Encelia farinosa* as a component in the higher elevations of the Granite Mountains and possibly elsewhere on lighter-colored substrate.

***Encelia farinosa* Alliance (4114)**

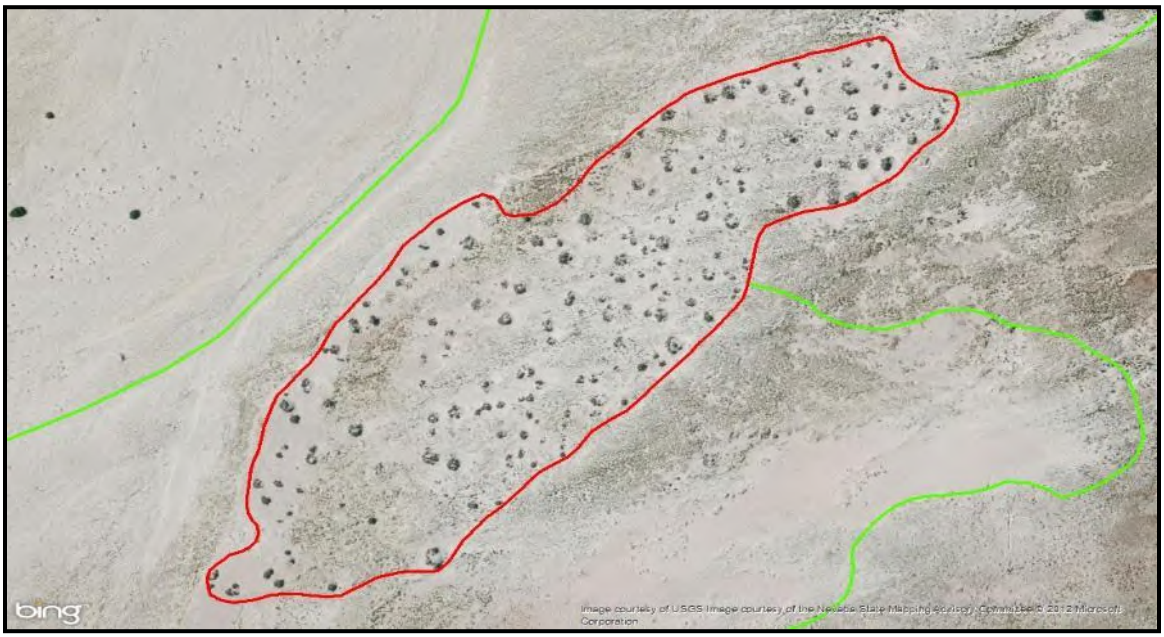



**DISTRIBUTION:** The *Encelia farinosa* Alliance has its highest concentration of stands in the upper elevations of the mountains of the Colorado Desert, as well as in the Pinto Mountains southeast of the Twentynine Palms area. Stands also occur on mid to upper (most exposed) south-facing and hottest slopes in the Central and Eastern Mojave region. In the current study area, the *Encelia farinosa* Alliance is mapped throughout the upper elevations of the Chocolate Mountains in the Picacho subarea; and only in the Coyote Mountains of the Salton Sea South subarea.



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

California joint fir scrub Alliance




This image shows the dark green clonal rings of *Ephedra californica* growing adjacent to a wash on a very sandy substrate.

In the foreground *Ephedra trifurca* occupies a sandy dune with some tawny *Pleuraphis rigida* in the background.

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

**DESCRIPTION:** In this Alliance *Ephedra californica* or *Ephedra trifurca* dominates or co-dominates with *Ambrosia salsola, Senna armata, Gutierrezia californica* or *Brickellia incana. Ephedra californica* is typically found on broad, active washes of mid to upper bajadas and fans. In the Caliente Creek Canyon, *Ephedra californica* occurs on steep colluvial hillslope settings with components of *Encelia actoni, Hesperoyucca whipplei*, and *Eriogonum fasciculatum* in the stand. *E. californica* may be confused with the similar *Ephedra trifurca,* found on 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 and mapped under the *Ephedra californica – Ephedra trifurca* Alliance. Stands dominated by *Senna armata* with either species of *Ephedra* intermixing as an evenly distributed and important shrub, are also placed in this alliance.

Note: As part of this project effort, additional classification data collection and analysis were performed for the Jawbone South and Owens Valley subareas. Florisitic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Castela emoryi* Alliance (4229), a rare type, was reassigned as an Association of the *Ephedra californica – Ephedra trifurca* Alliance (4211). The Salton Sea region, which includes Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.

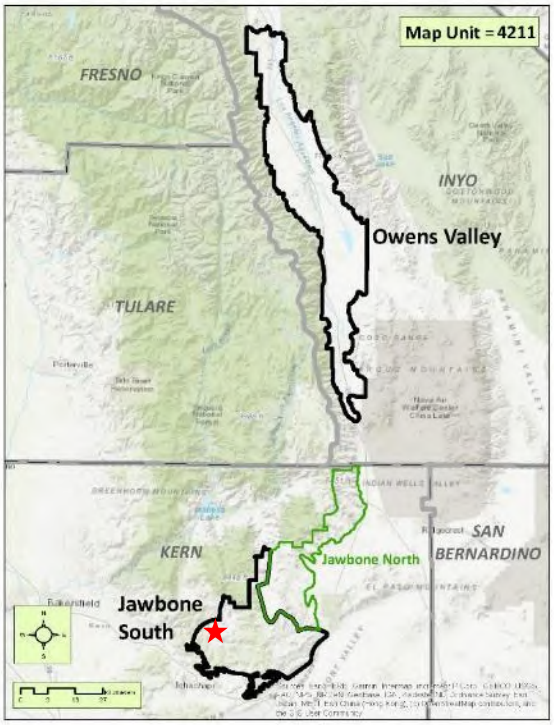
**PHOTOINTERPRETATION SIGNATURE:** The stands are typically open to moderately dense with a color variation from gray to green. Individuals have a dense crown with well-defined edges and grow in evenly spaced and/or clonal ring patterns. Shrubs tend to be medium to large and spreading with a very sparse herbaceous understory. The dark-colored shrubs contrast markedly with the white sandy or rocky substrate on which *Ephedra* frequently occurs. Stands tend to have a low diversity of shrubs, with *Atriplex canescens* at times co-dominating the stand, which typically creates minimal variability in the overall signature for this type. *Castela emoryi* is a rare type and difficult to establish a consistent reliable photo signature. Stands are mapped from field data.

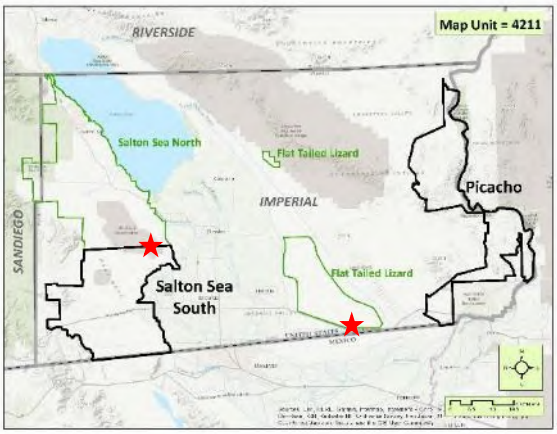
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *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 are fuzzier and less defined.

- *Atriplex canescens* Alliance (5111) – This species can co-dominate a stand with *E. californica* in areas along the Mojave River. Crowns are less distinct, smaller, and not as dark colored. Nevertheless, when the two species co-occur, they are difficult to distinguish.
- *Larrea tridentata* Alliance (4119) – *L. tridentata* tends to have more of 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.

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



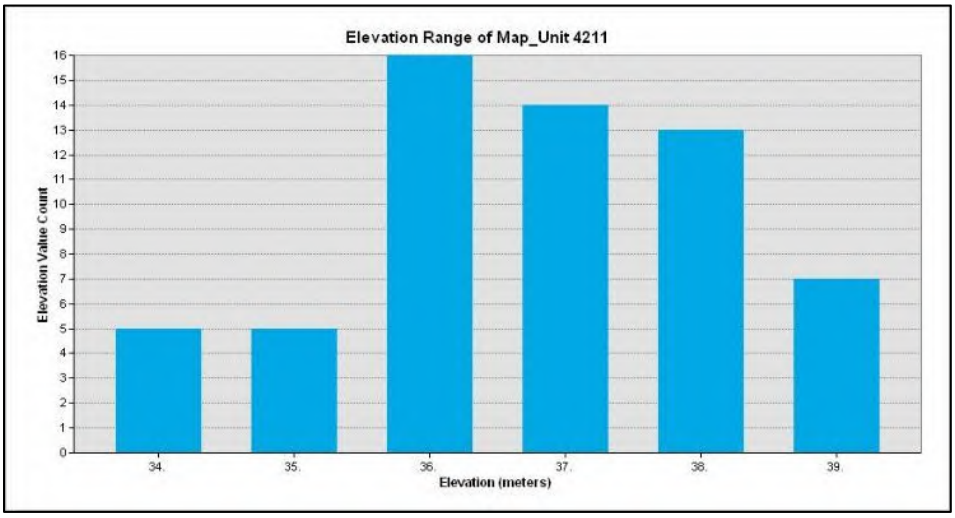




**DISTRIBUTION:** The highest concentration of stands occurs in small washes in the Central Mojave Desert and north of the San Bernardino Mountains. *Ephedra trifurca* is identified on dunes west of the Parker Valley portion of the Colorado River and on several long, narrow sand sheets just west of the Algodones Dunes in the Salton Sea Trough zone. In the current study area, three polygons of *Ephedra californica* were mapped, one in the U.S. Naval Reservation Recovery Parachute Test Range in the Salton Sea North subarea (represented as a star), one on East Mesa in the Flat-Tailed Horned Lizard subarea (represented as a star); and one polygon in Caliente Creek Canyon near Twin Oaks in the Jawbone South subarea (represented as a star).

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

**Due to small aerial extent no Elevation Range Chart is provided**

North subareas

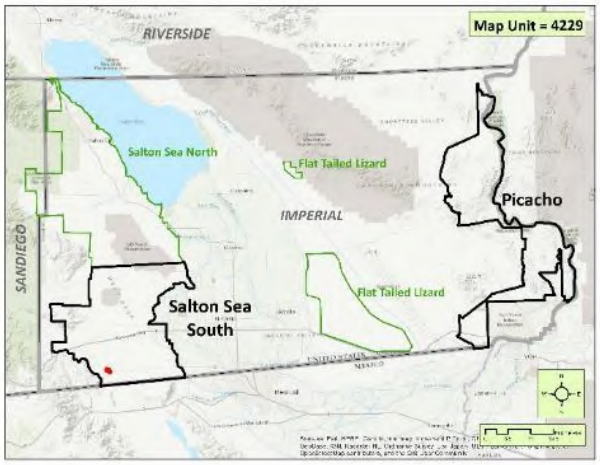



South subareas

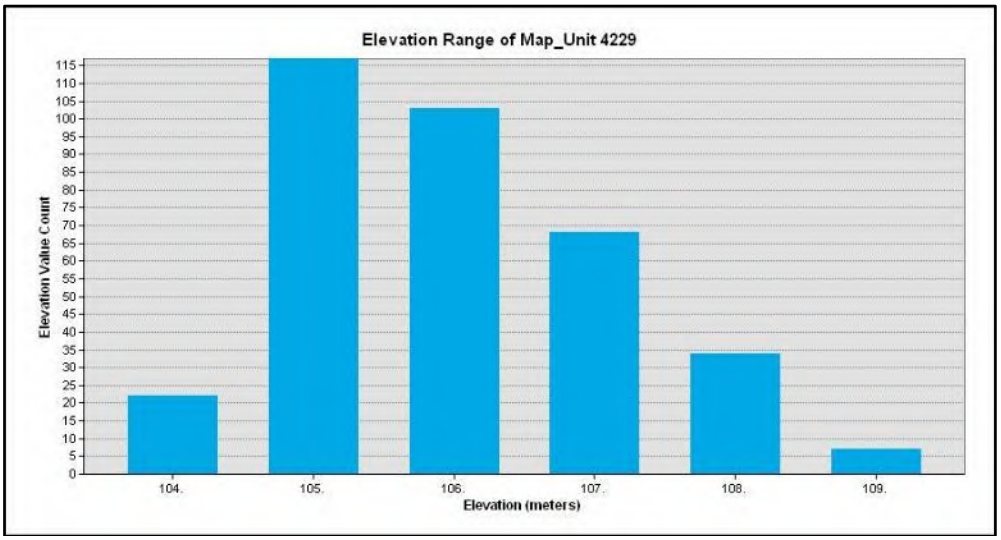
## *Castela emoryi* Special Stands (formerly Alliance) (4229)

Crucifixion thorn Special Stands

Note: As part of this project effort, additional classification data collection and analysis were performed for the Jawbone South and Owens Valley subareas. Florisitic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Castela emoryi* Alliance (4229), a rare type, was reassigned as an Association of the *Ephedra californica – Ephedra trifurca* Alliance (4211). The Salton Sea region, which includes Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.




**DISTRIBUTION:** Stands of the crucifixion thorn plant are rare within the DRECP area. In the current study area, only one stand of *Castela emoryi* was mapped adjacent California State Route 98 in the Yuha Basin in the Salton Sea South subarea. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.



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

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


Shown above is a representative example of a dense stand of *Ephedra nevadensis* on a middle to upper bajada with a sparse cover of *Yucca brevifolia.* Note: This screenshot is a portion of a larger polygon whose boundaries are not shown.

Stands of *Ephedra nevadensis*, like the example in this photo, occur frequently on middle to upper fans in the Antelope Valley near Palmdale and Littlerock. Emergent *Yucca brevifolia* is present here in sparse cover over a dense layer of annual grasses.

***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* or *Chrysothamnus viscidiflorus.* This Alliance is made up of six Sub-alliances and Associations as described below:

For the *Ephedra nevadensis* Sub-alliance, *Ephedra nevadensis is* dominant or co-dominant. Stands occur in two basic situations: (1) cooler mid or upper rocky slopes of mountains where *Salazaria mexicana, 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 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.

*Ephedra nevadensis* Stands often mix with other mid-elevation scrub species such as *Grayia spinosa*, *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 mountain ranges. If *Eriogonum fasciculatum* is co-dominant with *E. nevadensis,* the stand would key to *Eriogonum fasciculatum – Viguiera parishii* Alliance.

For the *Lycium andersonii* Sub-alliance, *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 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).*

For the *Grayia spinosa* Sub-alliance, *Grayia spinosa* is usually at least 2 percent absolute cover (less than 2 percent in sparse stands), evenly distributed, and no other species with substantially greater cover. Co-dominance is the rule with *Grayia* 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 resprout 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 are this Sub-Alliance. If *Ephedra viridis* is present with at least 2 percent cover and evenly distributed, then it is considered the *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 of more recent fire. Stands transition to *Ambrosia dumosa* adjacent to *Larrea tridentata – Ambrosia dumosa* on lower slopes, to *Ericameria teretifolia* or *Ephedra nevadensis* on convex rocky slopes, to *Salazaria mexicana* on concave (often burned) rocky slopes, or to *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, to *Krascheninnikovia lanata* on calcareous soils, or to *Ambrosia dumosa* or *Larrea tridentata – Ambrosia dumosa* on well-drained slopes above cold air pockets...

For the *Lycium cooperi* Provisional Association, *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 are considered those Sub-alliance or 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 *Atriplex canescens*, *Salazaria mexicana,* or *Prunus fasciculata*, as in washes and arroyos, they are considered those Alliances.

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

For the *Ericameria cooperi* Provisional Association, *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* having 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 – Bebbia juncea* Alliances. Stands co-dominated by *Ericameria nauseosa* or *Ericameria teretifolia* usually key to those Alliances, respectively. *E. cooperi* occurs commonly in the Mojave Desert in all subregions. It is spring-flowering and a 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.

For the *Ephedra nevadensis – Ericameria cooperi* Association, *Ericameria cooperi* is evenly distributed and dominant to co-dominant with other shrubs including *Atriplex* spp., *Ephedra nevadensis, Grayia spinosa*, and *Lycium andersonii* in rocky often volcanic hills and slopes.

**PHOTOINTERPRETATION SIGNATURE:** This combined alliance contains a variety of species that occur in a mid-elevation zone along the desert margin in the Sierra Nevada foothills. Well-developed stands boast a diverse mix of species such as *Ephedra nevadensis, Lycium andersonii, Grayia spinosa, Ericameria cooperi, Krascheninnikovia lanata, Encelia actoni,* and *Acamptopappus sphaerocephalus,* with minor components of *Ambrosia salsola, Eriogonum fasciculatum*, *and Salazaria mexicana.*

*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.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Eriogonum fasciculatum – Viguiera parishii* Alliance (2221) – This type can establish in a variety of settings, but dominant stands are restricted to ultra-rocky, north-facing slopes where cover is open but may vary widely within the stand. Many times these stands have a component of *Hesperoyucca whipplei* which appears as a compactly rounded, dark gray to black signature. Photointerpretation issues arise when *E. fasciculatum* begins to blend into diversely mixed stands containing *Ephedra nevadensis*, *Lycium cooperi*, and *Grayia spinosus* (amongst other shrubs). These species all have similar gray signatures when mixed, and whether stands are sparse or moderately dense, reliable photointerpretation between species is difficult. Therefore, mappers modeled stands of this type on rocky, eroded slopes with a presence of *Hesperoyucca whipplei*.

**Types with Similar Photointerpretation Signatures to *Ericameria cooperi* component**

- *Eriogonum fasciculatum – Viguiera parishii* Alliance (2221) – Overall, compared to *Ericameria cooperi,* these shrubs have a consistent gray or brown color, with somewhat larger crowns. Stands dominated by *E. fasciculatum* are usually significantly larger than *E. cooperi*.
- *Prunus fasciculata – Salazaria mexicana* Alliance (7212) – Mature individuals of *Prunus fasciculata* are larger in size than *Ericameria cooperi*, with a dark green to dark gray color. Individual crowns may coalesce into clonal clumps in denser stands.
- *Artemisia tridentata* Alliance (5311) – This species has an overall bluish green or bluish gray color, with mature plants having a larger crown than *Ericameria cooperi*. Individuals may appear in clumps or spread evenly throughout the stand. Stands are more likely to occur near well-drained wash settings.

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

**Types with Similar Photointerpretation Signatures to *Grayia spinosa* component**

- *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. Both types can have a minor component of *Larrea tridentata*; however, hill slopes occurring adjacent to the *Grayia spinosa* Sub-alliance will most likely lack *Larrea* in the stand. If *Larrea tridentata* drops out of a stand along the margins of a well-defined cold-air basin, it is more likely that the stand will be *Grayia spinosa* Sub-alliance. *Grayia spinosa* tends to occur on north faces at higher elevations, whereas *Ambrosia dumosa* may tend to be found on the south-facing slopes.
- *Krascheninnikovia lanata* Alliance (5412) – Stands where this species dominates are difficult to distinguish from other light-colored shrubs, including *Grayia spinosa.* This Alliance is generally mapped from field data and subsequent extrapolation based on the presence of light-colored calcium-rich soils, often containing a whitish caliche layer at the surface.
- *Prunus fasciculata – Salazaria mexicana* Alliance (7212) – Denser, more mature stands of *Salazaria mexicana* have a blue-green color, while stands on ultra-steep, rocky, or burned settings appear faint with a light gray crown and a reduced size. Plants within this type often form small dense patches along lower slopes adjacent to small washes. *Salazaria mexicana* is less likely to occur as a mapping type on minimally dissected broad alluvial fans containing fine silty soils.
- *Coleogyne ramosissima* Alliance (5421) – Shrubs have a darker gray to grayish brown color with a well-defined crown than *Grayia spinosa*. Stands of *Coleogyne ramosissima* are easily recognizable against the light-colored rocky pediments with shallower soil where they are likely to occur. Like *Grayia spinosa, Coleogyne* tends to have consistent cover and shrub size across the stand; however, the understory herbaceous cover is generally very sparse. Difficulties in signature recognition between species occurs when *Coleogyne* stands begin to break up (sometimes due to human disturbance or fire) and other desert shrubs begin mixing into stands.

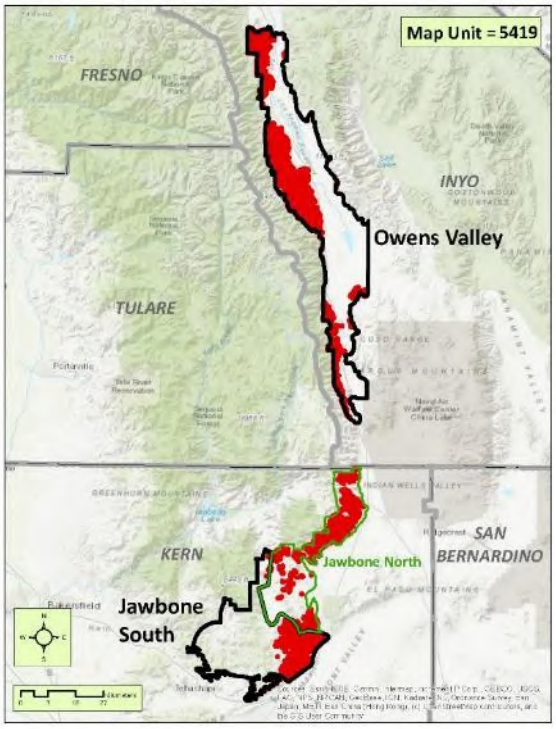
**Types with Similar Photointerpretation Signatures to Ephedra nevadensis component**

- *Eriogonum fasciculatum – Viguiera parishii* Alliance (2221) – When the *Ephedra nevadensis* Sub-alliance occurs in post fire settings, *Eriogonum fasciculatum* often co-dominates or occurs immediately adjacent to the stand. In adjacent stands, *Eriogonum fasciculatum* will tend to have a lower shrub cover and individual shrubs are smaller in size. Shrub cover is less consistent across the stand and the overall signature color can have a minor brown tint to an otherwise dark gray color. Stands of *Eriogonum* tend not to form clonal patterns as much as *Ephedra. Eriogonum fasciculatum* will also occur on steeper slopes such as the side slopes to a larger ravine or the steeper dissected portions of alluvial fans.

On steeper slopes in the desert mountain ranges, *Eriogonum fasciculatum* is one of the few shrubs that form a dense enough cover to be recognized on the imagery. Shrubs in these settings tend to also be a dark brown, and overall size is small.

- *Prunus fasciculata – Salazaria mexicana* Alliance (7212) – Stands dominated by *Prunus fasciculata* and *Salazaria mexicana* are often smaller and limited more to toe slopes, wash margins and associated older floodplains. Stand cover is less consistent, forming small, widely scattered dense clonal-looking patches. Individual shrubs tend to be a lighter gray color, at times with a slight tint of green.
- *Ephedra viridis* Alliance (5417) – Small stands occur in very rocky steep and protected settings, especially in the desert mountain ranges. Differentiating the two *Ephedra* species on the imagery is very difficult, and subtle differences in ecological and topographical setting are not always reliable. Even though a typical healthy *E. viridis* can look greener on some imagery, dense mixtures with multiple desert species blend signatures and textures together in a gray mosaic. On a broad scale, *E. viridis* is more common in the northernmost portions of the Mojave Desert.

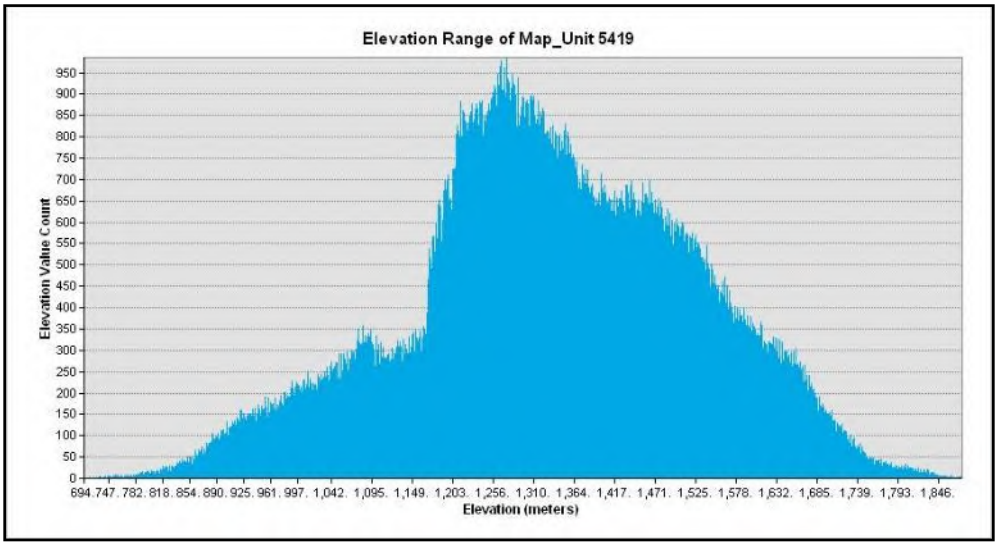
***Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419)**




**DISTRIBUTION:** The highest concentration of mapped stands of *Ericameria cooperi* occurs between Summit Valley and Hesperia. There are also a few scattered stands at the foot of the Tehachapi Mountains along the upper elevation fans. The largest concentration of *Grayia spinosa* stands occurs along the northern fringe of the Western and Central Regions of the Mojave Desert. Another concentration of stands is located in protected canyons of the Newberry, Ord, Rodman, Sidewinder, and Stoddard Mountain ranges. No *Grayia* stands have been mapped in the DRECP south and east of the Ord Mountains. *Ephedra nevadensis* is found on the higher alluvial and colluvial fans from the eastern portions of the Antelope Valley to the upper elevations of the Lucerne Valley. Isolated small stands are found throughout the desert mountain ranges. Stands are more common in the northern and eastern Mojave.

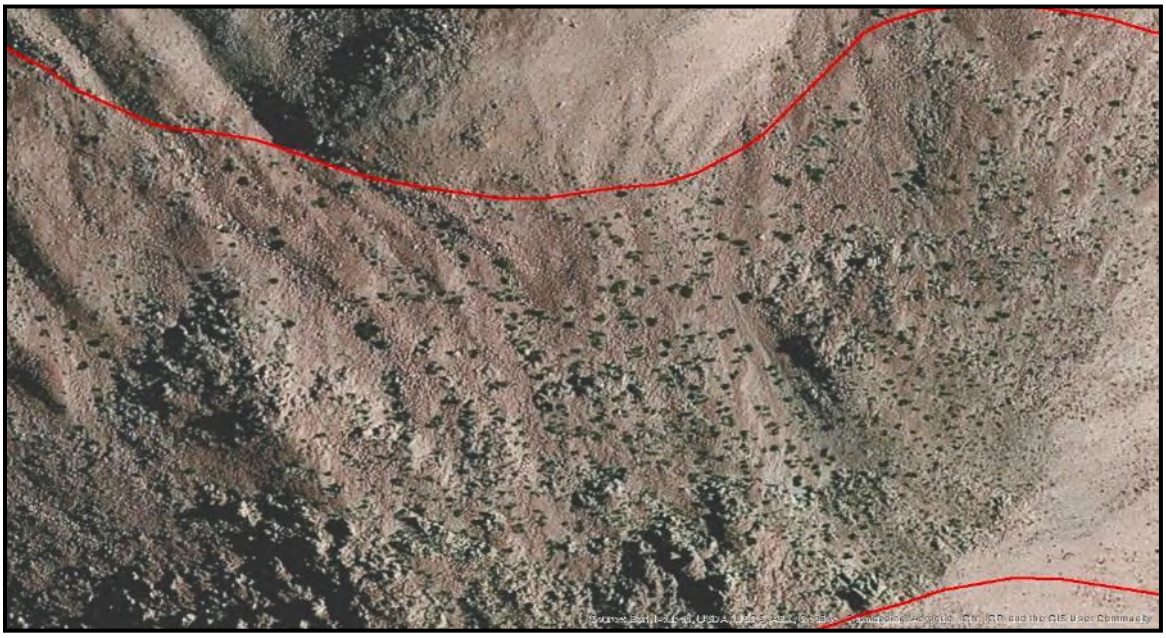
In the current study area, this Alliance is mapped throughout the desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas; and all along the upper fans of the western side of the Owens Valley subarea, with additional sites southeast of Owens Lake, and east of Haiwee Reservoir.

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

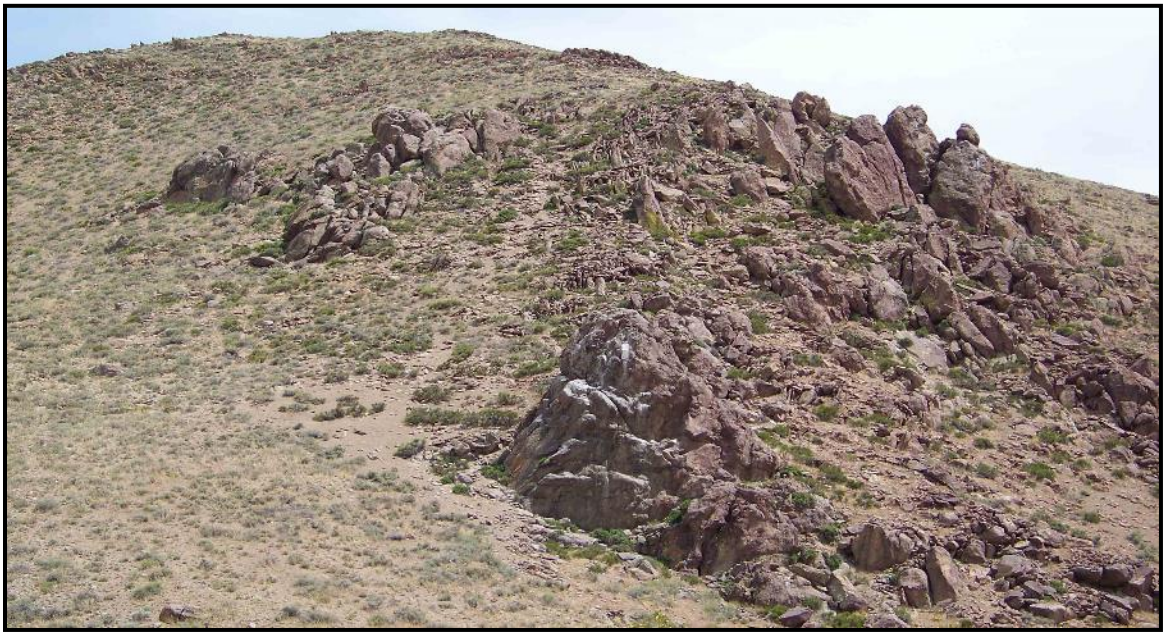


## *Ephedra viridis* Alliance (5417)

Mormon tea scrub Alliance



In the above image, *Ephedra viridis* is seen as a dark, medium-sized shrub co-dominating with smaller shrubs including *Grayia spinosa.*



*Ephedra viridis* is seen here as the bright green shrubs mixed between the rocky boulders.

***Ephedra viridis* Alliance (5417)**

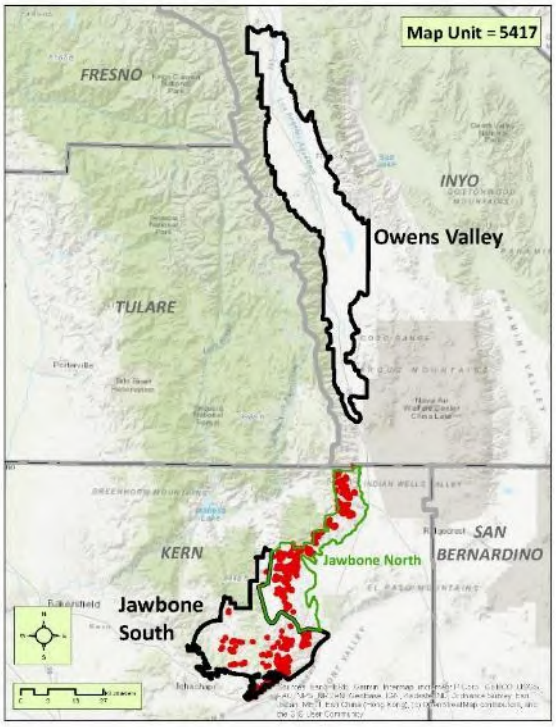
**DESCRIPTION:** In stands of this Alliance *Ephedra viridis* comprises at least 2 percent of the cover, 1 percent when stands are sparse, and is dominant or co-dominant with *Ericameria teretifolia, Grayia spinosa, Salazaria mexicana, Krascheninnikovia lanata, Ericameria cuneatus*, or *Eriogonum fasciculatum*. Stands are found on steep, boulder-covered slopes of middle to higher elevation mountains, from the Scodie Mountains west of the Los Angeles Aqueduct to the highest points of the Ord Mountains (above 1800 meters, or 5900 feet). *Ephedra viridis* is associated with steep talus or rock outcrops except at highest elevations, where it can occur on more moderate slopes. Stands tend to mix with *Grayia spinosa*, *Salazaria mexicana* or with *Ericameria teretifolia* at slightly lower and warmer rocky settings. Stands may also mix with *Brickellia desertorum* on slopes of the Sidewinder or Granite Mountains (near Apple Valley).

**PHOTOINTERPRETATION SIGNATURE:** Stand cover is typically sparse and is generally found on very rocky slopes, with individuals appearing as small rounded shrubs with a variable green to dark green color. Separating out this Alliance from other desert montane types is extremely difficult due to its generally sparse cover and small stand size.

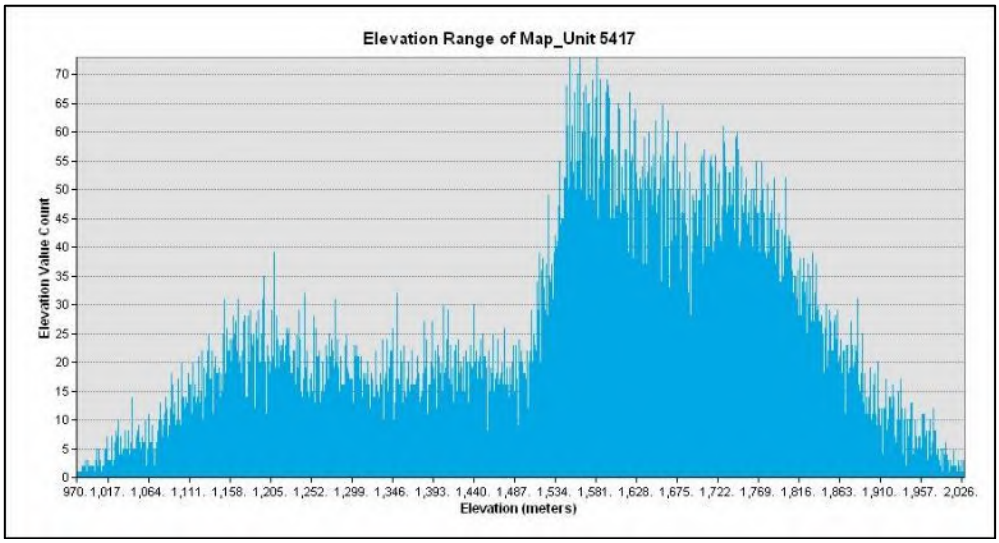
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Ericameria teretifolia* Alliance (5416) – Distinguishing these two Alliances is often extremely difficult in desert montane settings. Both Alliances occupy rocky middle and upper slopes, and both types generally occur in sparse cover. *Ericameria teretifolia* is more commonly found in concentrations in mountains near Lucerne Valley, and typically has a lighter green signature with smaller and more evenly spaced shrubs.
- Massive sparsely vegetated rock outcrop Mapping Unit (6115) – This sparsely vegetated type may contain a number of desert montane species including *Ephedra viridis.* It is extremely difficult to discern subtle differences of cover at or below 2 percent in these rocky settings.
- *Prunus fasciculata – Salazaria mexicana* Alliance (7212) – In rocky desert montane settings, *Salazaria mexicana* generally occurs in somewhat denser cover forming scattered clonal patches, usually on slopes closer to small ravines and washes. Crowns are generally lighter green and not as rounded. Difficulty separating out the two Alliances is due primarily to their sparse cover and small stand size.

***Ephedra viridis* Alliance (5417)**




**DISTRIBUTION:** Most of the mapped stands are either in the southern mountains and low hills of the Central Mojave Desert, or in the desert foothills of the southern Sierra Nevada. Other stands are found in scattered locations in the north central Mojave. In the current study area, *Ephedra viridis* is mapped at selected sites in the interior, and throughout the desert foothills, of the southern Sierra Nevada in the Jawbone North and South subareas.



## *Ericameria linearifolia – Cleome isomeris* Alliance (2214)

Narrowleaf goldenbush – Bladderpod scrub Alliance

In this example, *Ericameria linearifolia* occurs on a steep hillside in the far western portion of the study area.

*Ericameria linearifolia* dominates the shrub layer just downslope from a stand of *Pinus sabiniana*. Stands of this type often have an understory of annual grasses and native flowers including *Monolopia, Layia* and *Lasthenia.*

***Ericameria linearifolia – Isomeris arborea* Alliance (2214)**

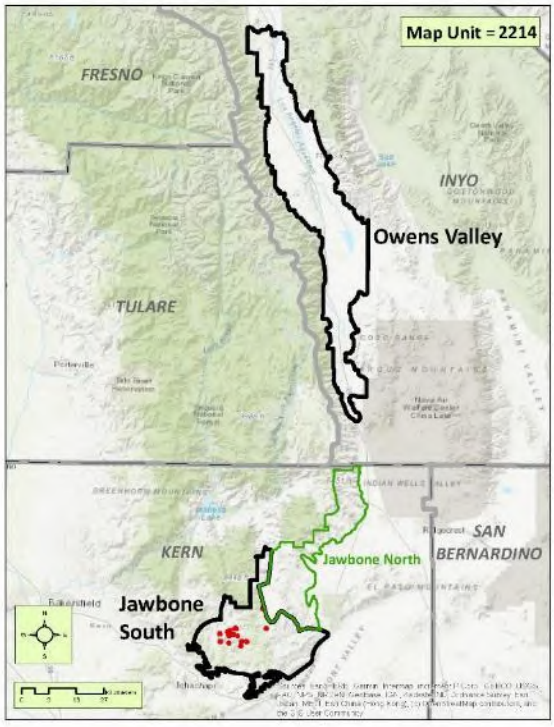
**DESCRIPTION:** In this Alliance, *Ericameria linearifolia* is dominant to co-dominant in the shrub canopy with *Cleome isomeris* and/or *Gutierrezia californica, Eriophyllum confertiflorum, Eriogonum fasciculatum Gutierrezia sarothrae,* and others. The herb layer can be well-developed, and *Poa secunda* is characteristically present.

**PHOTOINTERPRETATION SIGNATURE:** In undisturbed settings, *Ericameria linearifolia* occurs on fairly steep slopes on low hills with significant patches of bare ground, many times found in the understory of *Quercus douglasii* slopes. In these settings, their range is restricted to the westernmost portions of the study area. The signature-related characteristics are fairly indistinct; shrubs are small, gray to light brown, and lack a well-defined crown. Cover distribution in these stands are evenly scattered and consistently spaced apart. In disturbance areas, cover characteristics tend to be patchy and vary considerably along the slope. Stands are generally small in size. On cleared disturbance-related sites, *E. linearifolia* is difficult to differentiate from other early seral shrub types.

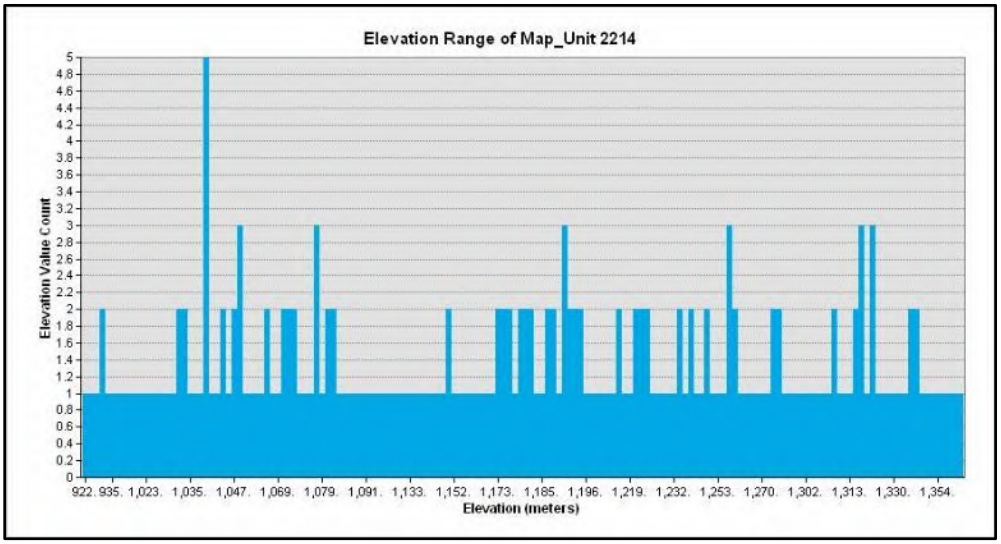
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Ericameria nauseosa* Alliance (5212) – Stands generally occur on the valley floor adjacent to hillsides containing *E. linearifolia* in the westernmost portion of the study area. *E. nauseosa* has a larger crown, and stands have a denser herbaceous understory associated with them.
- *Eriogonum fasciculatum – Viguiera parishii* Alliance (2221) – *Eriogonum fasciculatum* can be a component to the *Ericameria linearifolia – Cleome isomeris* Alliance. In these settings, *Eriogonum fasciculatum* has a slightly larger, more distinct crown and a darker gray signature with a trace of a brown hue. Also, *Eriogonum fasciculatum* will be found in dense patches on nearly level disturbed terrain immediately downslope from steeper hillsides of *Ericameria linearifolia* stands.
- *Eriogonum wrightii* Alliance (2222) – The signature-related characteristics of this type are fairly indistinct. *Eriogonum wrightii* shrubs are small and appear as a faint gray signature with an indistinct crown margin. Where *Ericameria linearifolia* and *Eriogonum wrightii* overlap, both occur in cleared disturbance-related sites and have indefinite signatures. This setting is where signature confusion arises between the two species.

***Ericameria linearifolia – Isomeris arborea* Alliance (2214)**




**DISTRIBUTION:** Most stands are found in the westernmost portions of the DRECP. In the current study area, *Ericameria linearifolia* is mapped in the interior southern Sierra Nevada of the Jawbone South subarea.



## *Ericameria nauseosa* Alliance (5212)

Rubber rabbitbrush scrub Alliance


This image shows a previously cleared setting where *Ericameria nauseosa* is one of the first colonizers following the cessation of active agriculture. Crowns vary considerably in size and shape across the stand and may appear as individuals or coalesce into clonal clumps.

The photo depicts a stand in the western Antelope Valley dominated by the grayish green *Ericameria nauseosa* over a dense herbaceous layer.

***Ericameria nauseosa* Alliance (5212)**

**DESCRIPTION:** This Alliance is mapped where *Ericameria nauseosa* has at least 2 percent absolute and at least 30 percent relative cover. If *Ericameria nauseosa* is co-dominant with *Eriogonum fasciculatum*, then the stand is considered the *Eriogonum fasciculatum – Viguiera parishii* Alliance. Stands are found in middle and upper elevations, usually in disturbed areas with agricultural, flood, fire, or grazing history. This broad and variable species is typically a "cold desert" rather than a "warm desert" species, and its presence in the western Mojave Desert is due to the cooler temperatures and higher rainfall associated with the Antelope Valley and the upper fans adjacent to the Tehachapi and San Gabriel Mountains and Sierra Nevada. Mappable stands in the Owens Valley often have *Atriplex lentiformis* var. *torreyi*, which when co-dominant are mapped to the *Ericameria nauseosa – Atriplex lentiformis* Mapping Unit (5217). If *Distichlis spicata, Sporobolus airoides*, and/or *Leymus cinereus* alone or together with other herbs are at least 3 times the absolute cover of *E. nauseosa* and other shrubs, then the stand is considered their respective herbaceous Alliances.

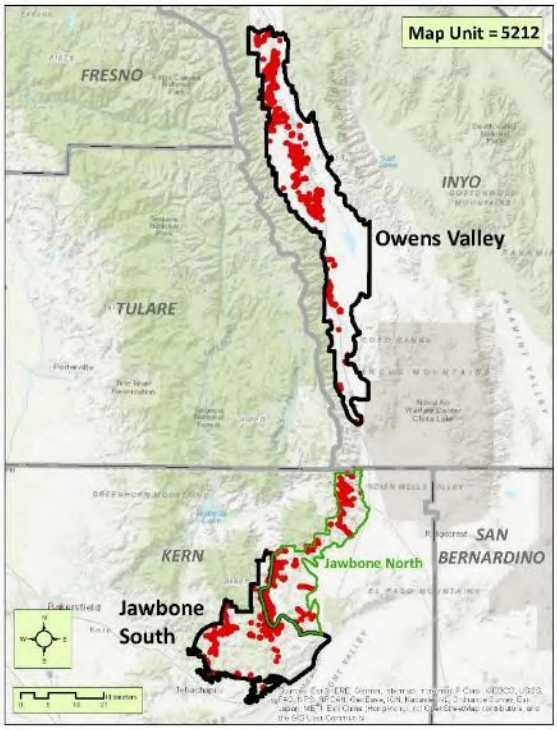
**PHOTOINTERPRETATION SIGNATURE:** Stands can have a sparse to very dense cover of shrubs. Cover may vary considerably across a stand, appearing as individuals and/or coalescing to form clonal clumps. Shrubs have a gray or bluish green color with a small rounded crown. Disturbance is a common indicator of this Alliance. Mapping of this type is facilitated by the evident remnant row scarring from old agriculture, and scarring from other related activities.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

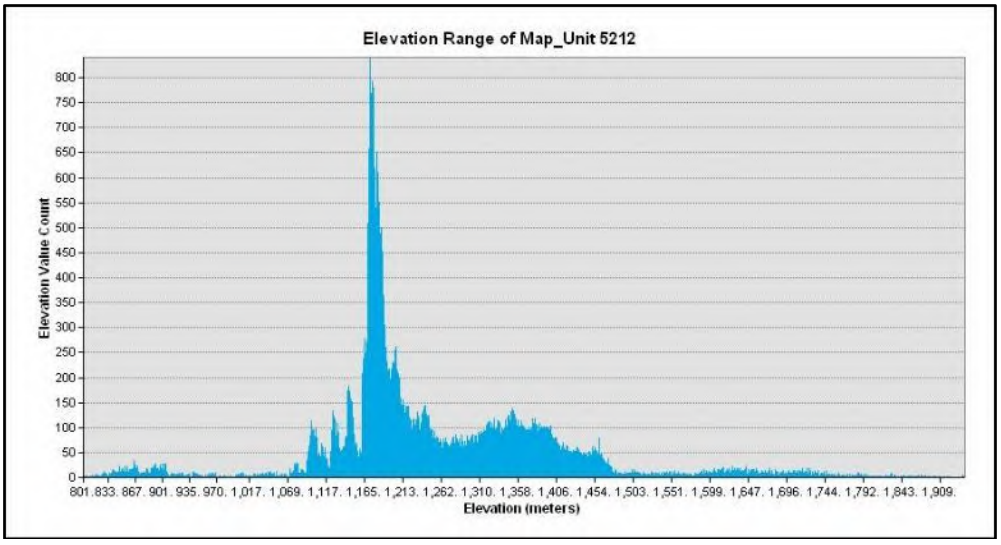
- *Artemisia tridentata* Alliance (5311) – Both *Ericameria nauseosa* and *Artemisia tridentata* have a bluish gray to bluish green color depending on maturity of the stand. In early seral settings, *A. tridentata* tends to occur in denser cover and have larger crowns. In more mature stands, *A. tridentata* is less likely to be found in disturbed settings and more often will occur on lower slopes and gravelly floodplains. Older stands of *E. nauseosa* are more associated with post disturbance cleared sites.
- *Atriplex canescens* Alliance (5111) – Although *Atriplex canescens* can establish in anthropogenically disturbed areas, *E. nauseosa* is more closely associated with recent clearings and fallow agricultural fields. *A. canescens* establishes more commonly along sandier flats adjacent to drainages.
- *Atriplex polycarpa* Alliance (4113) – Stands of this Alliance occur farther into the interior of the desert regions. *A. polycarpa* tends to favor a slightly more alkaline setting and is therefore more likely to be found closer to dry lake beds and their associated clay-like soils. Overlap between the ranges of the two species is significant; however, within these areas *A. polycarpa* tends to have more of a consistent cover across the stand.
- *Ephedra nevadensis* Sub-alliance of the *Ephedra nevadensis – Lycium andersonii – Grayia spinosus* Alliance (5419) – Overall, these stands tend to be denser and have more consistent shrub cover. *Ephedra nevadensis* stands typically are more diverse in species composition, often occurring with emergent *Yucca brevifolia*. Stands with a dense shrub cover tend to yield subtle green hues.

- *Lepidospartum squamatum* Alliance (4212) – In most settings, *E. nauseosa* and *L. squamatum* typically occur adjacent to one another, with *E. nauseosa* on the drier margins of the riparian terrace and the *L. squamatum* along the more active channels. However, in disturbed floodplain settings, such as Caliente Creek, attributed to active grazing and/or impacted by other human disturbances (i.e. flood control or OHV activity), the typical distribution patterns and signature characteristics of the species may be altered, and complicate photo interpretation as well as predictive modeling. *E. nauseosa* typically appears dark gray in color, but color and crown definition may widely vary relative to the health of the plant.

***Ericameria nauseosa* Alliance (5212)**




**DISTRIBUTION:** *Ericameria nauseosa* stands occur in high concentration at the western edge of the DRECP area in the western Antelope Valley and the foothills of the San Gabriel and San Bernardino Mountains, and Sierra Nevada. They are primarily related to human disturbances such as roadside clearings and fallow agricultural fields. This Alliance does not occur east of Hesperia or in the Colorado Desert. In the current study area, *Ericameria nauseosa* is mapped along drainages and some slopes throughout the interior southern Sierra Nevada of the Jawbone South subarea; the Kelso Valley and desert foothills of the southern Sierra Nevada of the Jawbone North subarea; and throughout the western alluvial fans of the Owens Valley subarea.



## 5217 – Ericameria nauseosa – Atriplex lentiformis Mapping Unit

Rubber Rabbitbrush – Quailbush scrub Alliance

Highlighted on the image is a mixed stand of *Ericameria nauseosa* and *Atriplex lentiformis* along a floodplain terrace of the Owens River.

This example shows a stand of *Ericameria nauseosa* with a mix of *Atriplex lentiformis* near the Owens River.

***Ericameria nauseosa – Atriplex lentiformis* Mapping Unit (5217**

**DESCRIPTION:** In stands of this Mapping Unit, *Atriplex lentiformis* can co-dominate or strongly dominate the stand with *Ericameria nauseosa*. This type is mapped in the Owens Valley on alkaline substrate in disturbance settings, often in recently grazed areas that have been previously cleared. Stands frequently occur with a low herbaceous component often comprised of S*porobolus airoides* and/or *Distichlis spicata.*

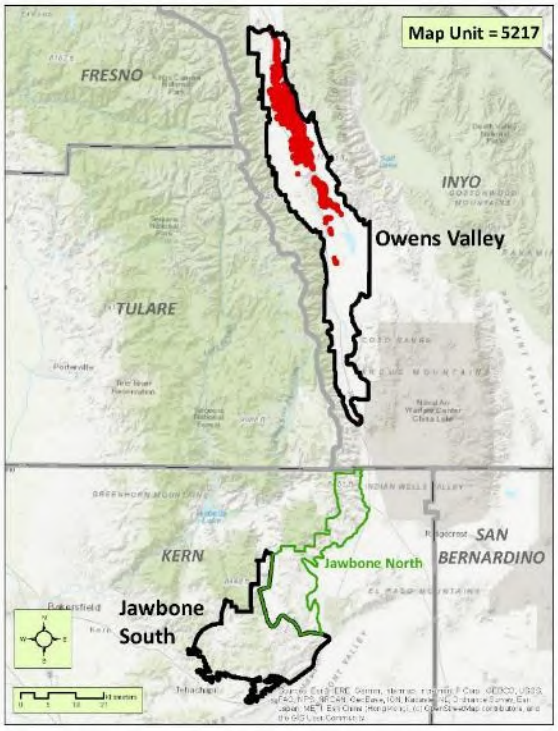
**PHOTOINTERPRETATION SIGNATURE:** *Ericameria nauseosa* and *Atriplex lentiformis* frequently occur together over extensive areas, generally in the lower portions of the floodplain. *Ericameria* has a gray or bluish green color with a small rounded crown. *A. lentiformis* appears as small rounded blue gray to tawny-colored shrubs.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

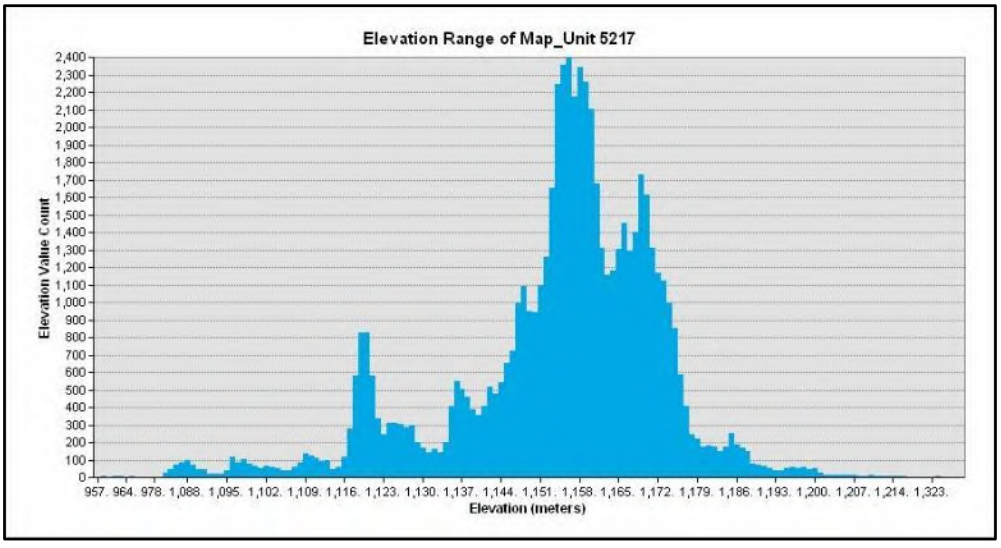
- *Atriplex lentiformis* Alliance (3722) – Stands dominated *by Atriplex lentiformis* occur in alkaline settings often downslope to *Sarcobatus vermiculatus* or *Atriplex confertifolia* Alliances.
- *Ericameria nauseosa* Alliance (5212) – Stands of pure *Ericameria nauseosa* occur more often in recently cleared areas in less alkaline settings. Shrub cover is often highly variable across the stand. *Ericameria nauseosa* yields a similar glaucous like blue-gray color but crown size is generally smaller than *Atriplex lentiformis.*

- *Sporobolus airoides – Muhlenbergia asperifolia – Spartina gracilis* Alliance (3712) – *Sporobolus* meadows can have a significant component of either *Ericameria nauseosa* or *Atriplex lentiformis* in cover as high as 15 percent.

***Ericameria nauseosa – Atriplex lentiformis* Mapping Unit (5217)**




**DISTRIBUTION:** In the current study area, this Mapping Unit is mapped in the Owens Valley subarea throughout the lower portions of the Owens River floodplain and along a few sites edging Owens Lake.



## *Ericameria paniculata* Alliance (4213)

Blackstem rabbitbrush Alliance


The image shows a narrow wash containing the dark green-colored *Ericameria paniculata* scattered intermittently along the main stream channel. Adjacent polygons to the north and south contain the brownish *Larrea tridentata* and the smaller gray *Ambrosia dumosa*.

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

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

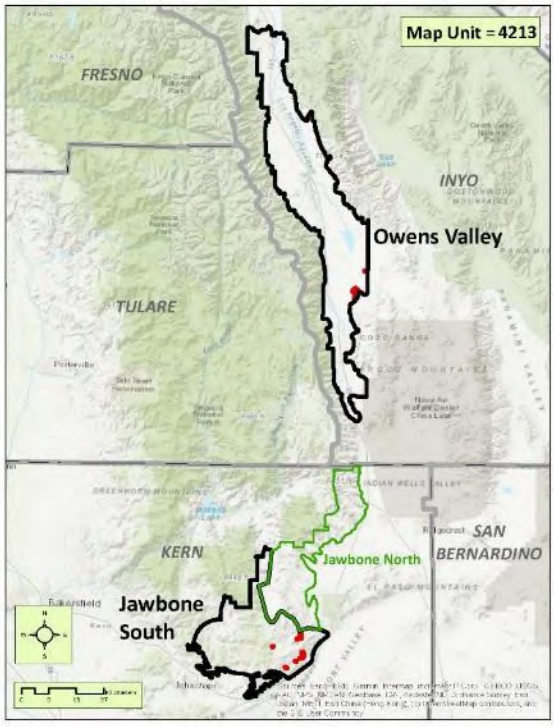
**DESCRIPTION:** This Alliance is mapped where *Ericameria paniculata* is dominant or co-dominant in the shrub canopy. *E. paniculata* comprises 2 percent of the absolute cover or more and at least 25 percent of relative cover. It is widespread throughout a broad elevation range in much of the Mojave 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.

**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.

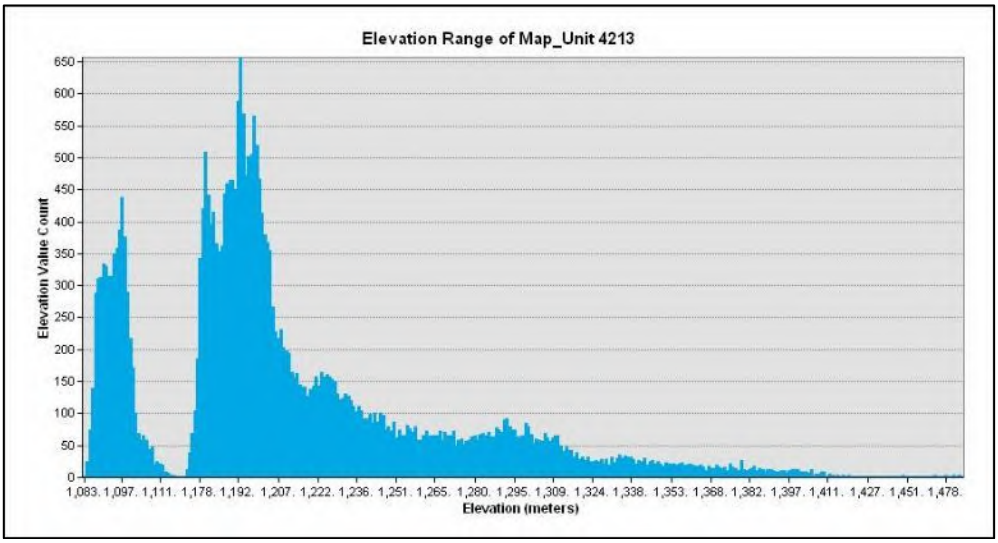
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *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.
- *Prunus fasciculata – Salazaria mexicana* Alliance (7212) – *Prunus fasciculata* is very similar in size and color but prefers gravelly canyons and washes on upper fans, usually in higher elevations.

***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, *Ericameria paniculata* is mapped in the desert foothills of the southern Sierra Nevada in the Jawbone South subarea; and on selected washes on the alluvial fans southeast of Owens Lake in the Owens Valley subarea.



## *Ericameria teretifolia* Alliance (5416)

Needleleaf rabbitbrush scrub Alliance

This image shows a rocky, steep setting where *E. teretifolia* appears as small, dark, rounded individuals widely scattered on the uppermost slopes.

In this picture, *E. teretifolia* plants are the lighter green shrubs in the upper portion of the rocky slope mixing with the grayer *Brickellia desertorum.*

***Ericameria teretifolia* Alliance (5416)**

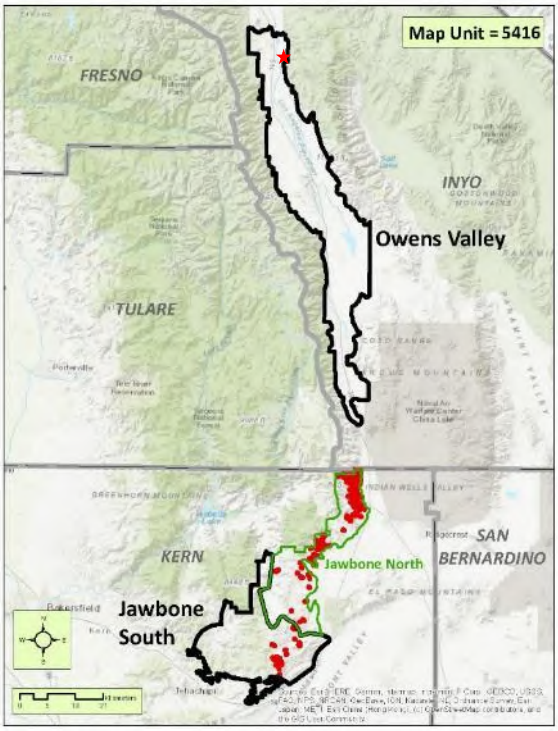
**DESCRIPTION:** *Ericameria teretifolia* comprises at least 2 percent cover in stands of this Alliance, but can be less cover when sparse. No other species has greater cover, but *Ericameria teretifolia* can share dominance with *Eriogonum fasciculatum, Gutierrezia sarothrae*, or *Opuntia chlorotica*. When *Ericameria teretifolia* is co-dominant with *Grayia spinosa, Ephedra viridis, Coleogyne ramosissima,* or *Salazaria mexicana*, then the *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance, *Ephedra viridis* Alliance, *Coleogyne ramosissima* Alliance, or *Prunus fasciculata – Salazaria mexicana* Alliances, respectively, are mapped. Within the study area, *E. teretifolia* is usually found as low-cover shrubland in granitic or other rocky uplands on south- or north-facing steep, bouldery slopes. Stands are found in disturbed uplands in the mid-elevation Mojave or Colorado Desert, but also occur in undisturbed stands on shallow granitic pediments and rock outcrops. *Ericameria teretifolia* may occupy shallow, rocky, post fire stands associated with *Juniperus californica* or other upland Alliances. *Ericameria teretifolia* tolerates high temperatures better than *Ephedra viridis,* and so is usually at lower elevations.

**PHOTOINTERPRETATION SIGNATURE:** Stand cover is typically very sparse and occurs on steep rocky upper slopes. Shrubs appear as scattered, dark, rounded individuals, generally with distinct well-defined crowns. Separating out this Alliance from other montane types is extremely difficult due to its generally sparse cover and small stand size.

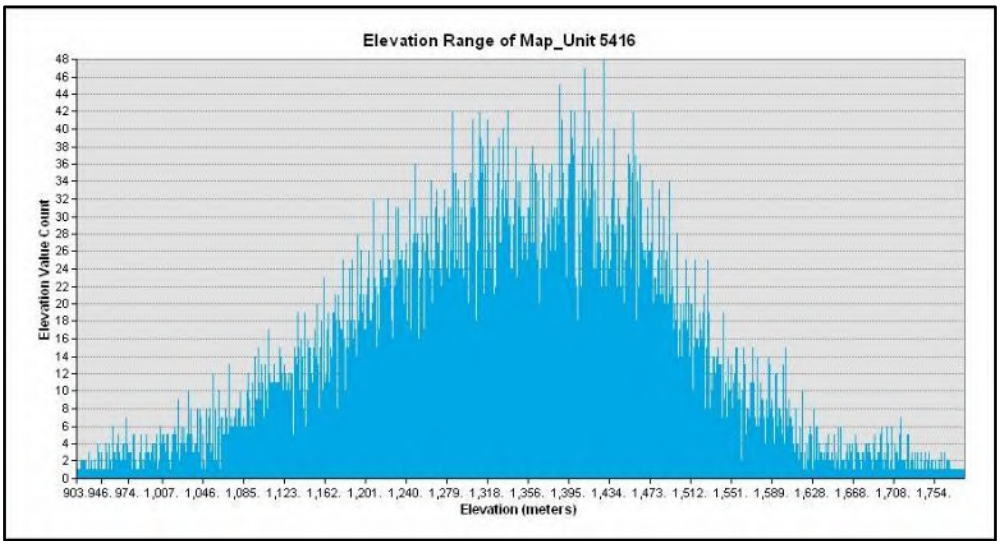
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Ephedra viridis* Alliance (5417) – Separating out these two Alliances is problematic at best due to their similar vegetative signatures and environmental constraints. The overall distribution of *Ephedra viridis* tends to be significantly outside the study area to the north, but this distribution is not reflected in the small amount of mapped polygons of both types.
- Massive sparsely vegetated rock outcrop Mapping Unit (6115) – This sparsely vegetated type may contain a number of desert montane species, including *Ericameria teretifolia.* It is extremely difficult to discern subtle differences of cover at or below 2 percent in these rocky settings.
- *Prunus fasciculata – Salazaria mexicana* Alliance (7212) – This Alliance also occurs on montane desert ranges, but generally is found on lower slopes and along ravines. Sparse cover of both Alliances in these settings makes vegetative distinctions extremely difficult. *Salazaria mexicana* is generally more associated with recent fire history even in these settings.

***Ericameria teretifolia* Alliance (5416)**

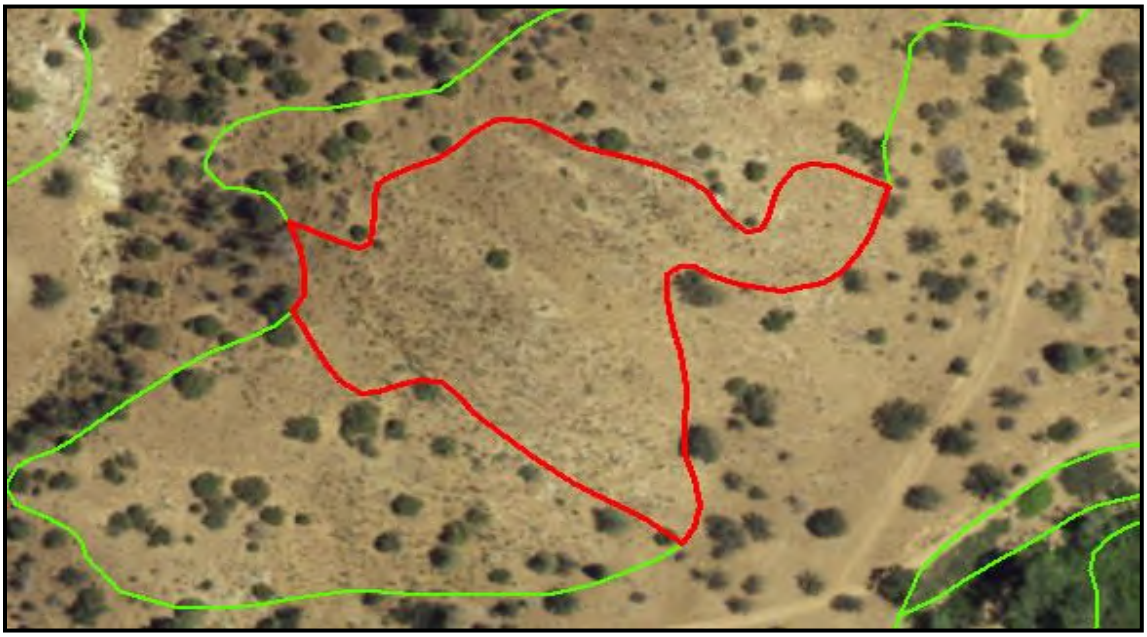



**DISTRIBUTION:** Stands occupy the middle and upper slopes of a number of mountains in the Central Mojave Desert. Isolated stands also occur in disturbance settings in the southern Sierra Nevada foothills along the Los Angeles Aqueduct, in the El Paso Mountains, and southeast of the Lava Mountains. In the current study area, *Ericameria teretifolia* is mapped in the desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas; and one polygon (represented as a star) near the base of the Inyo Mountains west of Calvert Lake, in the Owens Valley subarea.



## *Eriogonum fasciculatum* Alliance (cismontane) (2226)

California buckwheat Alliance



This example of the *Eriogonum fasciculatum* Alliance occurs at about 3500 feet' in elevation on a low slope surrounded by *Juniperus californica* and *Quercus douglasii* stands. The small shrubs appear rounded and light brown in color.

In this photo, *Eriogonum fasciculatum* is seen with white flowers in the foreground mixed with *Ephedra viridis*. *Juniperus californica* and *Pinus monophylla* stands occur in the background.

***Eriogonum fasciculatum* Alliance (cismontane) (2226)**

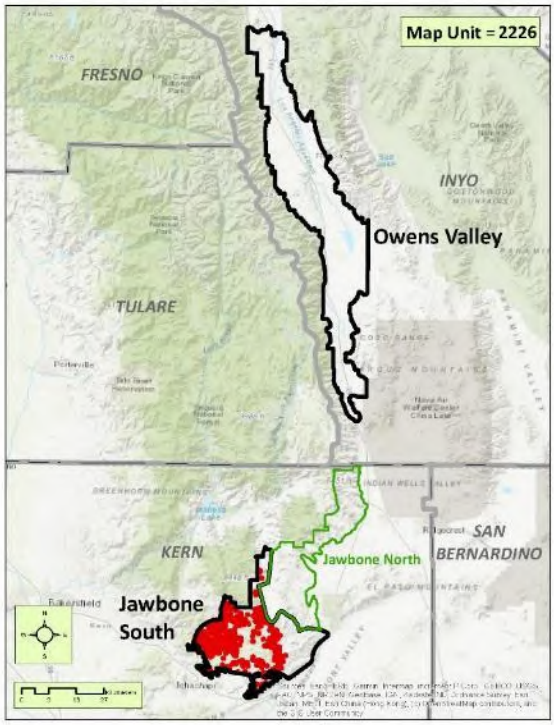
**DESCRIPTION:** *Eriogonum fasciculatum* is the dominant shrub, occurring with cismontane shrubs, such as *Eriogonum wrightii, Artemisia tridentata, Ceanothus cuneatus,* and *Lotus scoparius*; or *Hesperoyucca whipplei* is the dominant or co-dominant shrub with *Eriogonum fasciculatum, Ephedra californica,* or *Lupinus albifrons* in cismontane stands or desert transitional settings in the desert foothills of the Sierra Nevada. Stands of this Alliance may also occur among *Quercus douglasii* and *Quercus wislizeni* woodlands.

**PHOTOINTERPRETATION SIGNATURE:** Throughout much of its range, *E. fasciculatum* maintains a medium to dark brown signature color with a distinct crown. Undisturbed stands can occur along drier stream terraces and/or on thin soil that reflects a white rocky substrate. In post clearance disturbance settings, it often occurs as fairly distinct patches with relatively high cover. Signature variability across its range is lower than most seral types due to its strong dominance in many of the mapped stands. Some stands may be associated with transportation corridor clearings and are easily recognizable.

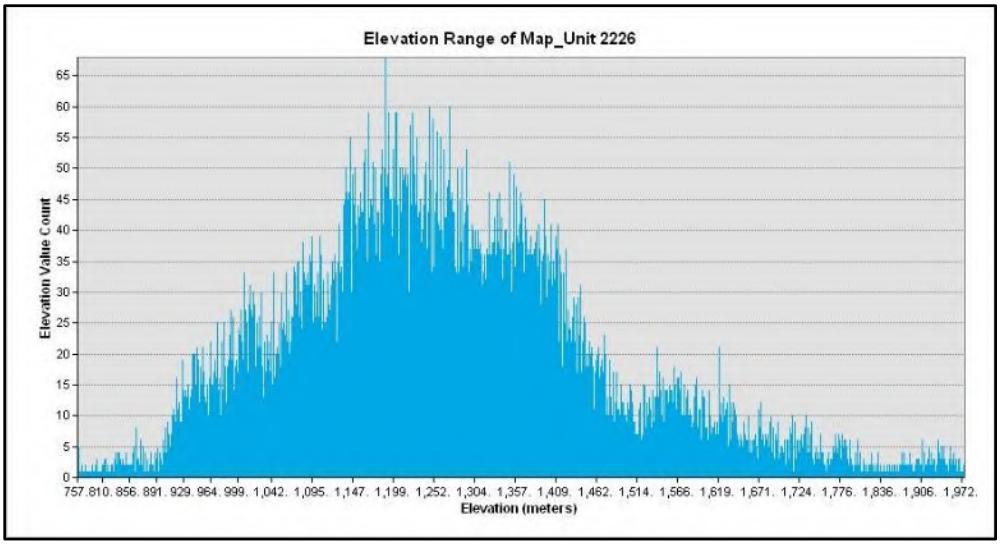
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Ericameria linearifolia – Cleome isomeris* Alliance (2214) – Where the two species overlap, *Ericameria linearifolia* is found on steeper hill slopes, upslope and adjacent to post clearance stands of *Eriogonum fasciculatum*.
- *Eriogonum fasciculatum – Viguiera parishii* Alliance (2221) – *E. fasciculatum* is the common species between this Alliance and the *Eriogonum fasciculatum* Alliance. But it's the associated species in the surrounding areas and the elevational range it occupies that dictate which Alliance to assign. The drier, lower elevations exhibiting desert species such as *Ephedra* spp., *Coleogyne ramosissima, Grayia spinosa, Salazaria mexicana*, and *Ambrosia salsola* is identified as the *Eriogonum fasciculatum – Viguiera parishii* Alliance. Climbing higher in elevation (over 3000 feet) other chaparral species such as *Ceanothus cuneatus, Arctostaphylos viscida,* and *Cercocarpus montanus* begin to mix in the shrub layer next to *Quercus douglasii, Quercus wislizeni,* and *Juniperus californica* stands. Stands in this setting are designated as the *Eriogonum fasciculatum* Alliance (cismontane).
- *Eriogonum wrightii – Eriogonum heermannii – Buddleja utahensis* Alliance (2222) – Although both species are very similar in character and occupy similar settings (post disturbance colonizers), *Eriogonum wrightii* is smaller in stature, lighter in color, and has a more diffuse crown than *Eriogonum fasciculatum. Eriogonum fasciculatum* favor rockier outcrops than *Eriogonum wrightii*.

***Eriogonum fasciculatum* Alliance (cismontane) (2226)**




**DISTRIBUTION:** In the current study area, *Eriogonum fasciculatum* (cismontane) Alliance is mapped in the interior and desert foothills of the southern Sierra Nevada of the Jawbone South subarea.



## *Eriogonum fasciculatum – Viguiera parishii* Alliance (2221)

California buckwheat – Parish's goldeneye scrub Alliance

This example depicts *Eriogonum fasciculatum* in a dense cover (over 20 percent) in a post clearance disturbance. Note: this screenshot is a portion of a larger polygon whose boundaries are not shown.

The above photo depicts *Eriogonum fasciculatum* in flower, mixing with the brighter green *Ericameria* spp. The stand represents a returning shrub layer from a cleared field.

***Eriogonum fasciculatum – Viguiera parishii* Alliance (2221)**

**DESCRIPTION:** This Alliance takes the form of an *Eriogonum fasciculatum* Association and a *Viguiera parishii* Association. The *Eriogonum fasciculatum* type comprises at least 2 percent absolute cover or more than 50 percent relative cover in the shrub canopy. However, *Hyptis emoryi* or *Salvia dorrii* may have higher cover than *Eriogonum* (Thomas et al. 2004). In the desert hills and mountains above 1000 meters (3280 feet) elevation, *Eriogonum fasciculatum* occurs with many other semi-desert shrubs. If *Encelia actoni, Ericameria teretifolia, Purshia tridentata,* or *Ericameria linearifolia* are of equal or higher cover, the stands were mapped as those Alliances. Mixed stands containing *Ephedra nevadensis, Ambrosia salsola, Ericameria cooperi,* or *Grayia spinosa,* and other mid-elevation shrubs, only require *Eriogonum fasciculatum* to be higher cover and more evenly distributed than any of the other shrubs for the stands to be mapped as the *E. fasciculatum* Alliance, otherwise they may be considered the *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance. Generally, *E. fasciculatum* occurs on steeper, more protected, cooler slopes above the *Larrea tridentata – Ambrosia dumosa* zone. Most pure stands occur along the western edge of the DRECP, from the east face of the Tehachapi and Scodie Mountains, to southeastern edge of the Sierra Nevada within the desert margins. These stands, and those in the Cajon Pass area 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. *E. fasciculatum* also may co-dominate with *Viguiera parishii* and other mid-elevation desert shrubs on rocky granitic northerly facing slopes.

The *Viguiera parishii* type, occurs where *Eriogonum* is not co-dominant, *Viguiera* may be at least 1% cover with no other species with greater or equal cover, except, *Acacia greggii, Ambrosia dumosa, Simmondsia chinensis, Pleuraphis rigida, Lotus rigidus*, or *Encelia actoni* may be of greater cover. *Viguiera* occurs on rocky slopes in areas with cobbles, boulders, and washes. It is also found on boulder granitic slopes in the southeast portion of the DRECP. *Viguiera parishii* occurs on northerly slopes in the Mojave and Sonoran Deserts.

**PHOTOINTERPRETATION SIGNATURE:** *Eriogonum fasciculatum* occurs over wide areas of the western Mojave and adjacent desert margins. Throughout much of its range, *E. fasciculatum* maintains a medium to dark brown signature color with a distinct crown. In the ranges of the western Mojave, *E. fasciculatum* often occurs at less than 10 percent cover, making the signature color difficult to discern. In post clearance disturbance settings, it often occurs as fairly distinct patches with relatively high cover. Signature variability across its range is lower than most seral types due to its strong dominance in many of the mapped stands. Many stands along the desert margins may be associated with transportation corridor clearings and are easily recognizable.

***Eriogonum fasciculatum – Viguiera parishii* Alliance (2221)**

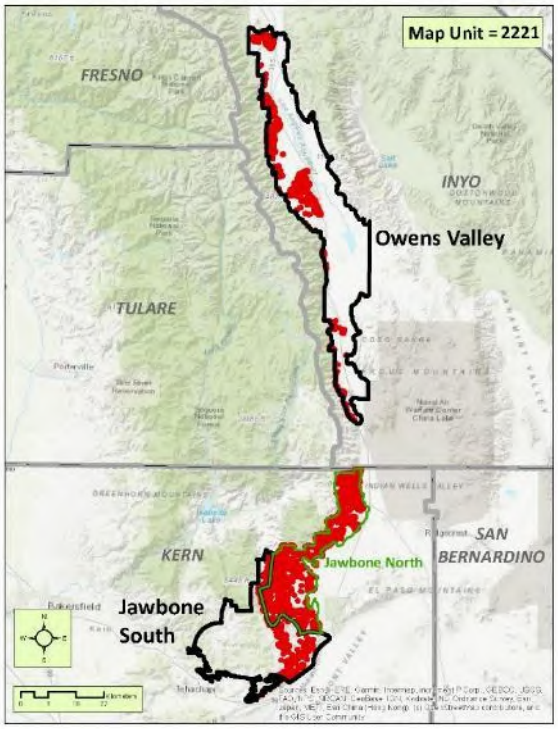
Stands of *Viguiera parishii* are restricted to ultra-rocky, north-facing slopes where cover is open but may vary widely within the stand. These plants commonly occur on very bouldery slopes where higher densities of exposed rock limit the space for shrubs to establish. Individuals appear as small gray plants with indistinct edges and are tucked between large rock outcrops and boulders. The absence of *Larrea tridentata*, and the severity of slope and rockiness along with the limited regional distribution of this species, characterize the criteria for how this Alliance is identified. Many times *Yucca schidigera* stands occur on the more gradual, less rocky toe slopes adjacent to these ultra-rocky areas.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

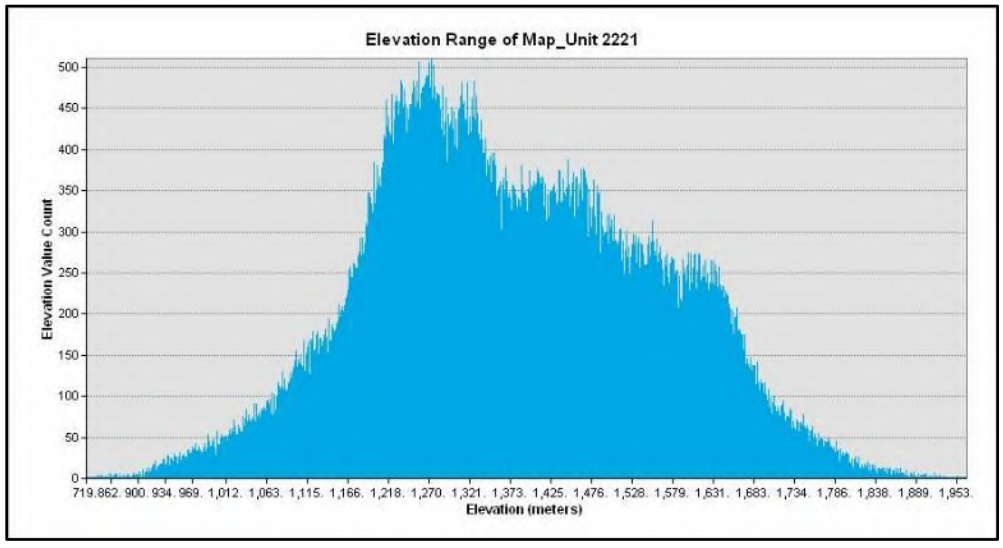
- *Ambrosia dumosa* Alliance (4111) – On middle and upper slopes of the desert ranges and eastern Sierra Nevada foothills, *Ambrosia dumosa* may occur near or adjacent to stands of *Eriogonum fasciculatum.* In these settings, although distinguishing the two types can be difficult due to the sparse cover, *A. dumosa* has a lighter gray crown. *E. fasciculatum* occurs on steeper, more protected, cooler slopes at higher elevations and has a darker, well defined crown edge.
- *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419) – This Alliance occurs in the mid elevational zone (+3000') in the lower mountains of the desert margins, fringing the lower desert foothills of the Sierra Nevada. Discerning the relative cover between *Eriogonum* and other mid-elevation shrubs is difficult in these highly diverse stands, where overall shrub cover is higher and variety of similar looking gray shrubs muddle individual signature identification. As the elevation increases further, *Eriogonum fasciculatum* will overtake the mid-elevation shrubs as the dominant species and transition out of the desert margin into the interior Sierra Nevada foothills, where the *Eriogonum fasciculatum* Alliance (2226) becomes the dominant *Eriogonum* type.
- *Ephedra viridis* Alliance (5417) – Stands of this type are usually very sparse in cover, on steep rocky escarpments. *Ephedra viridis* is a short dark gray or green shrub with a very well-defined crown margin that sometimes reveals a clonal arc or semi-circle pattern. *Eriogonum fasciculatum* occurs in similar settings with *Ephedra viridis* and has a similar size and color signature.
- *Ericameria linearifolia – Cleome isomeris* Alliance (2214) – Where the two species overlap, *Ericameria linearifolia* is found on steeper hill slopes, upslope and adjacent to post clearance stands of *Eriogonum fasciculatum*.

- *Eriogonum fasciculatum* (cismontane) Alliance (2226) – *E. fasciculatum* is the common species between this Alliance and the *Eriogonum fasciculatum – Viguiera parishii* Alliance. But it's the associated species in the surrounding areas and the elevational range it occupies that dictate which Alliance to assign. The drier, lower elevations exhibiting desert species such as *Ephedra* spp., *Coleogyne ramosissima, Grayia spinosa, Salazaria mexicana*, and *Ambrosia salsola* is identified as the *Eriogonum fasciculatum – Viguiera parishii* Alliance. Climbing higher in elevation (over 3000 feet), chaparral species such as *Ceanothus cuneatus, Arctostaphylos viscida*, and *Cercocarpus montanus* begin to mix in the shrub layer next to *Quercus douglasii, Quercus wislizeni* and *Juniperus californica* stands. Stands in this setting are designated as the *Eriogonum fasciculatum* (cismontane) Alliance (2226).
- *Salazaria mexicana* Association of the *Prunus fasciculata – Salazaria mexicana* Alliance (7212) – In the desert ranges, *Salazaria mexicana* may occur near or adjacent to *Eriogonum fasciculatum* in post burn settings. The sparse nature of the cover makes distinguishing the two types extremely difficult, especially on steep rocky slopes. In these settings, photointerpreters generally model the location of *S. mexicana* to very rocky areas in and adjacent to small washes in the lower portions of the mountains. Where cover increases, *S. mexicana* tends to be patchier and overall has a lighter gray signature with distinct crown edges along the margins of the vegetation patch.

***Eriogonum fasciculatum – Viguiera parishii* Alliance (2221)**




**DISTRIBUTION:** This type is common and widespread along the desert margins north of the Transverse Ranges, the Tehachapi Mountains, and the southern and eastern Sierra Nevada. Scattered localized stands occur in the interior desert mountains and hills. In the current study area, the desert type of *Eriogonum fasciculatum* is mapped in the desert foothills of the southern Sierra Nevada in Jawbone North and South subarea; and the upper to lower alluvial fan below the eastern Sierra Nevada in the Owens Valley subarea.



## *Eriogonum wrightii – Eriogonum heermannii – Buddleja utahensis* Alliance (2222)

Wright's buckwheat - Heermann's buckwheat - Utah butterfly bush patches Alliance

This example displays the faint crowns of the *Eriogonum wrightii* signature in an open stand. It is surrounded by a denser cover stand of *Ericameria teretifolia* and mixed shrubs.

The above photo depicts *Eriogonum wrightii* in a mixed stand with *Lupinus albifrons*, *Eriogonum fasciculatum*, and *Ephedra viridis* with *Achnatherum* grasses.

***Eriogonum wrightii – Eriogonum heermannii – Buddleja utahensis* Alliance (2222)**

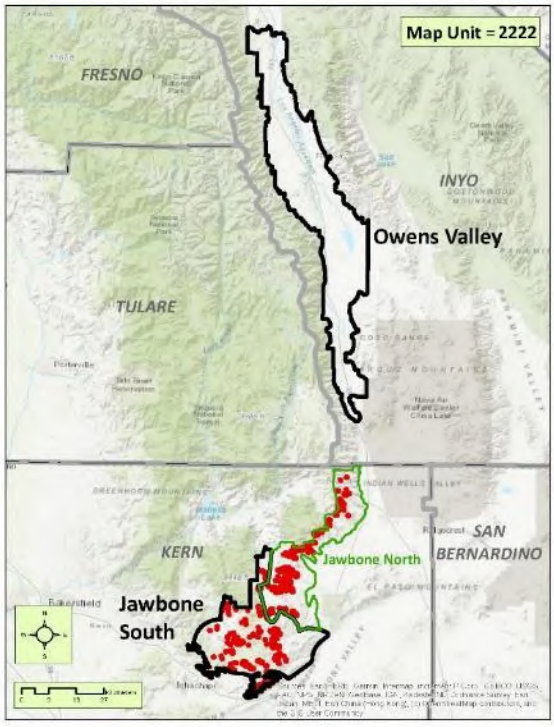
**DESCRIPTION:** *Eriogonum wrightii, Eriogonum heermannii, Buddleja utahensis, Hecastocleis shockleyi* is/are dominant or co-dominant. Often associated with *Eriogonum fasciculatum, Ericameria cooperi,* and *Prunus fasciculata* stands in the vicinity of Cajon Pass, and the southern Sierra Nevada. Stands may have emergent *Yucca brevifolia* or *Juniperus californica.*

**PHOTOINTERPRETATION SIGNATURE:** *Eriogonum wrightii* appears as a faint gray signature with an indistinct crown margin. *E. wrightii* yields very little signature and may be mistaken for what otherwise would look like an open annual grassland. Stands will range in cover from very sparse to moderately dense. High resolution images and ground data were used as ancillary data to confirm the presence of this difficult signature.

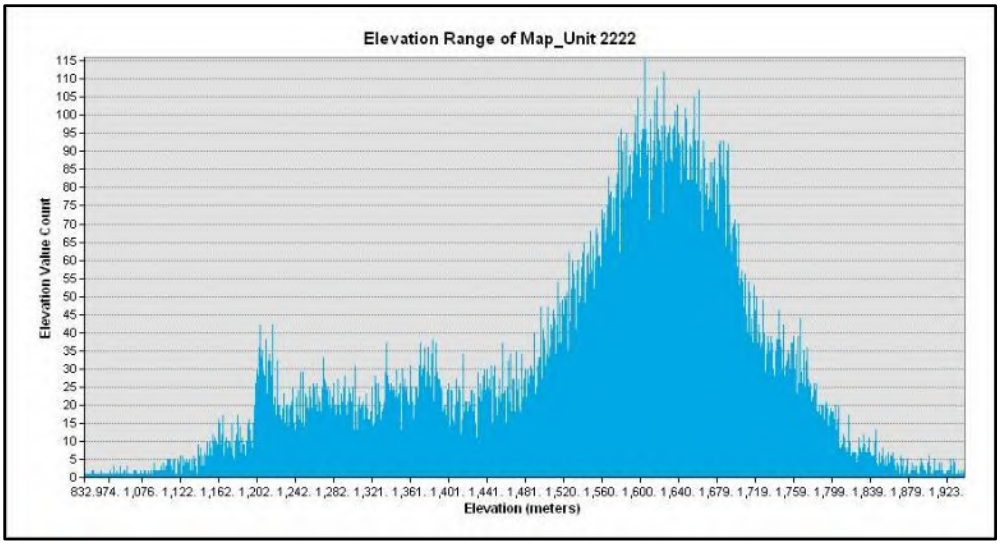
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Ericameria linearifolia – Cleome isomeris* Alliance (2214) – The signature-related characteristics of this type are fairly indistinct; shrubs are small, gray to light brown, and lack a well-defined crown. Where *Ericameria linearifolia* and *Eriogonum wrightii* overlap, both occur in cleared disturbance-related sites and have indefinite signatures. This setting is where signature confusion arises between the two species.
- *Eriogonum fasciculatum* (cismontane) Alliance (2226) – Although both species are very similar in character and occupy similar settings (post disturbance colonizers), *Eriogonum wrightii* is smaller in stature, lighter in color, and has a more diffuse crown than *Eriogonum fasciculatum. Eriogonum fasciculatum* favor rockier outcrops than *Eriogonum wrightii*.
- California annual and perennial grassland Mapping Unit (Native component) (2305) – *E. wrightii* yields very little signature and may be mistaken for what otherwise would look like an open annual grassland, such as *Achnatherum speciosum*.
- Mediterranean California naturalized annual and perennial grasslands Group (Weedy) (2330) – *E. wrightii* yields very little signature and may be mistaken for what otherwise would look like an open annual grassland.

***Eriogonum wrightii – Eriogonum heermannii – Buddleja utahensis* Alliance (2222)**

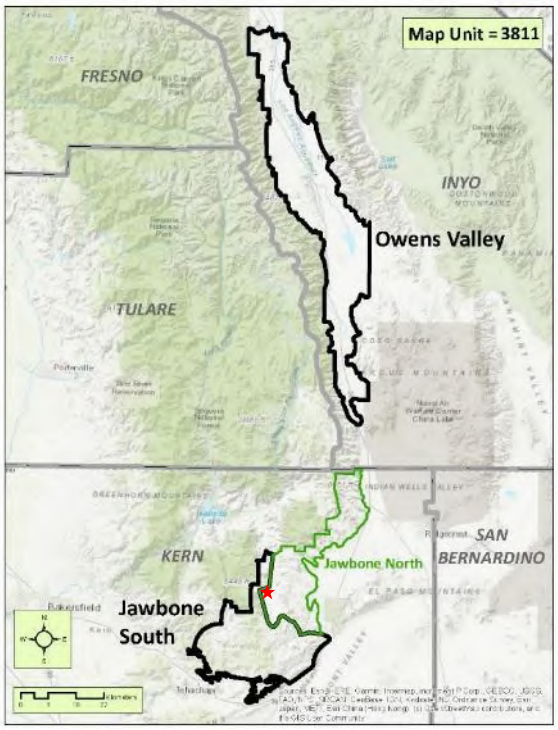



**DISTRIBUTION:** In the current study area, *Eriogonum wrightii* is mapped in the interior and desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas.



## *Frangula californica Alliance* (3811)

California coffee berry scrub




**DISTRIBUTION:** Stands of this *Frangula californica* (represented by a star) were infrequently mapped in the Kelso Valley of the Jawbone North subarea. These stands were not discernible from the imagery but were mapped from field data. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.

Due to small aerial extent no Elevation Range Chart is provided

## *Larrea tridentata* Alliance (4119)

Creosote bush scrub Alliance


The left side of the image displays a *Larrea tridentata*-dominated stand with a sparse, inconsistent subshrub cover over an open herbaceous understory. In contrast, the right side of the image reveals the two-tiered shrub layer of the *Larrea tridentata – Ambrosia dumosa* Alliance.

The photo depicts an upper fan dominated by *Larrea tridentata* over a moderately dense herbaceous understory.

***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*, *Eriogonum fasciculatum, Atriplex polycarpa, Krascheninnikovia lanata, Acamptopappus sphaerocephalus*, *Ephedra nevadensis,* or *Opuntia 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.

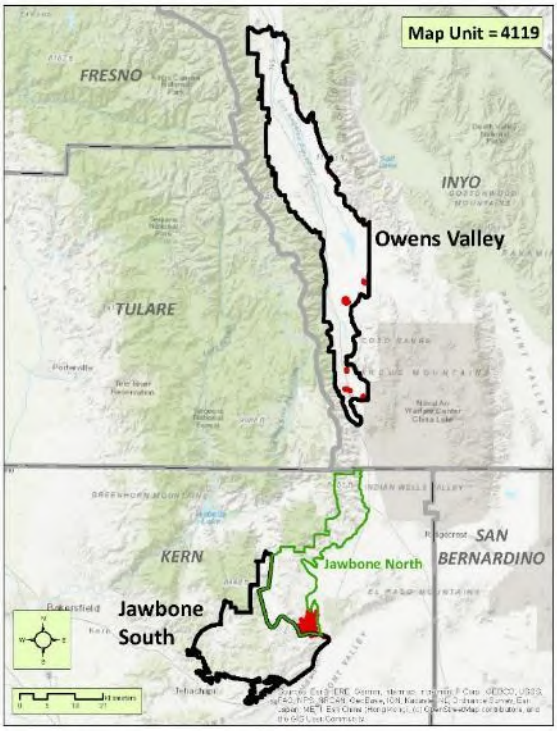
Note: There is a criteria change from previous DRECP mapping where co-dominance of *Larrea tridentata* with *Ambrosia salsola* was mapped as the Larrea tridentata Alliance (Menke et al., 2013).

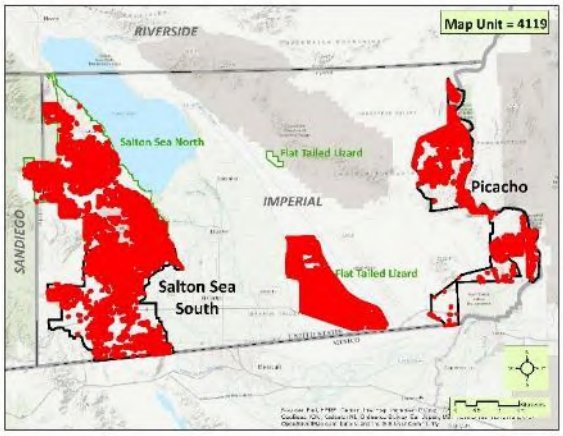
**PHOTOINTERPRETATION SIGNATURE:** These widely varying sized shrubs appear dark brown to green (depending on water availability) with a diffuse crown edge. Stand cover may be sparse to moderately dense, with individuals spaced evenly apart and emergent over an herbaceous or subshrub understory. Stands 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, photointerpreters use environmental criteria and adjacent stand identification to aid in distinguishing this dual-species Alliance.

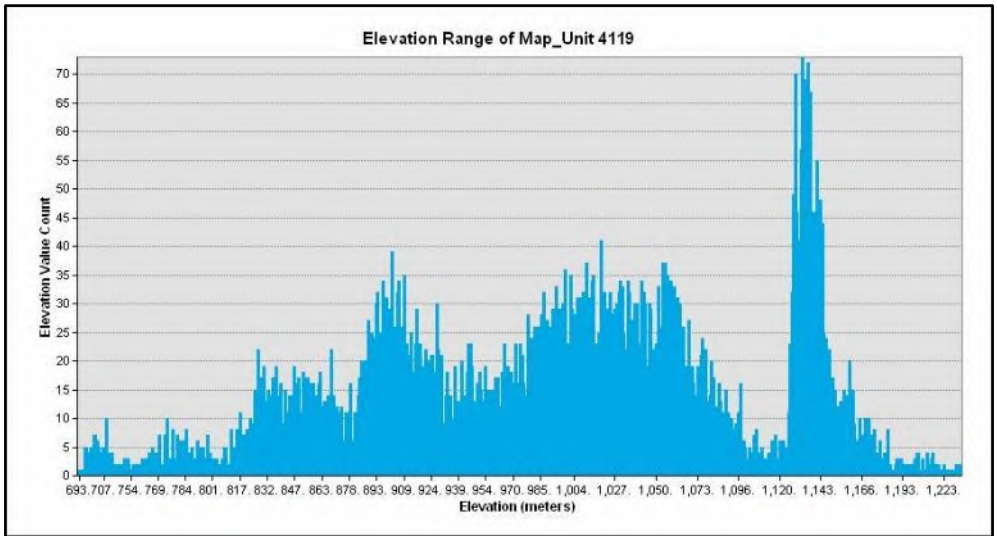
***Larrea tridentata* Alliance (4119)**



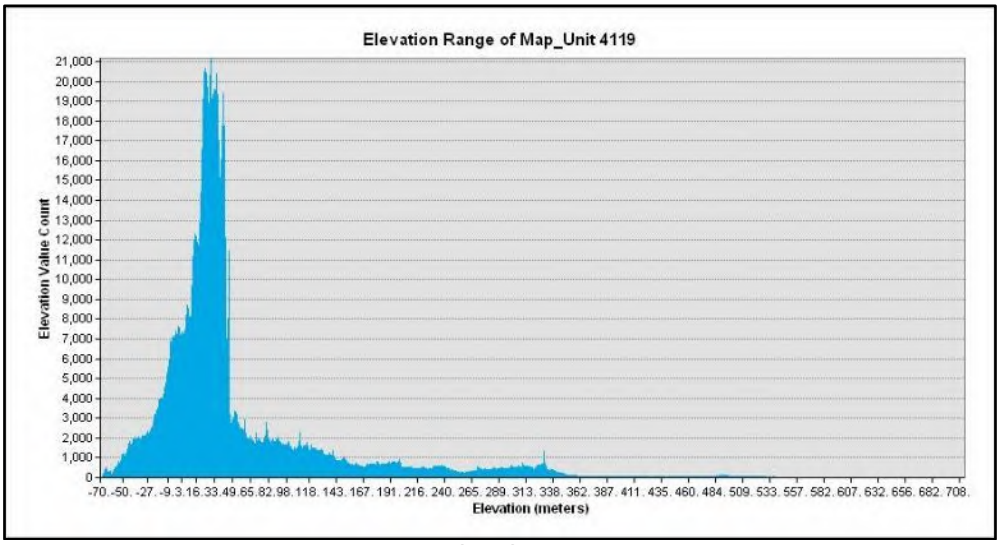




**DISTRIBUTION:** This Alliance is found throughout the Mojave and Colorado Desert portions of the DRECP. *Larrea tridentata* occurs on all but the highest elevations throughout the desert regions except on alkaline or wetland soils. Stands diminish in the Antelope Valley and do not occur the foothills, upper fans, and bajadas adjacent to the Tehachapi Mountains and the Transverse Ranges west of the Mojave River. Stands are frequently found on older impervious upper fans throughout the Central portions of the Mojave and Colorado Deserts. Within the Eastern Mojave Desert upper fans typically occur at elevations high enough to support stands of *Yucca brevifolia* or *Y. schidigera*. In the current study area, the *Larrea tridentata* Alliance is mapped throughout the Picacho, Salton Sea North and South and Flat-Tailed Horned Lizard subareas, however it is not mapped in the disjunct portion of the Flat-Tailed Horned Lizard subarea north of Tortuga. It is also limited to the Jawbone, Hoffman, and Alpine Canyons of the Jawbone North and South subareas; and several sites on alluvial fans around Owens Lake and in the Rose Valley of the Owens Valley subarea.

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



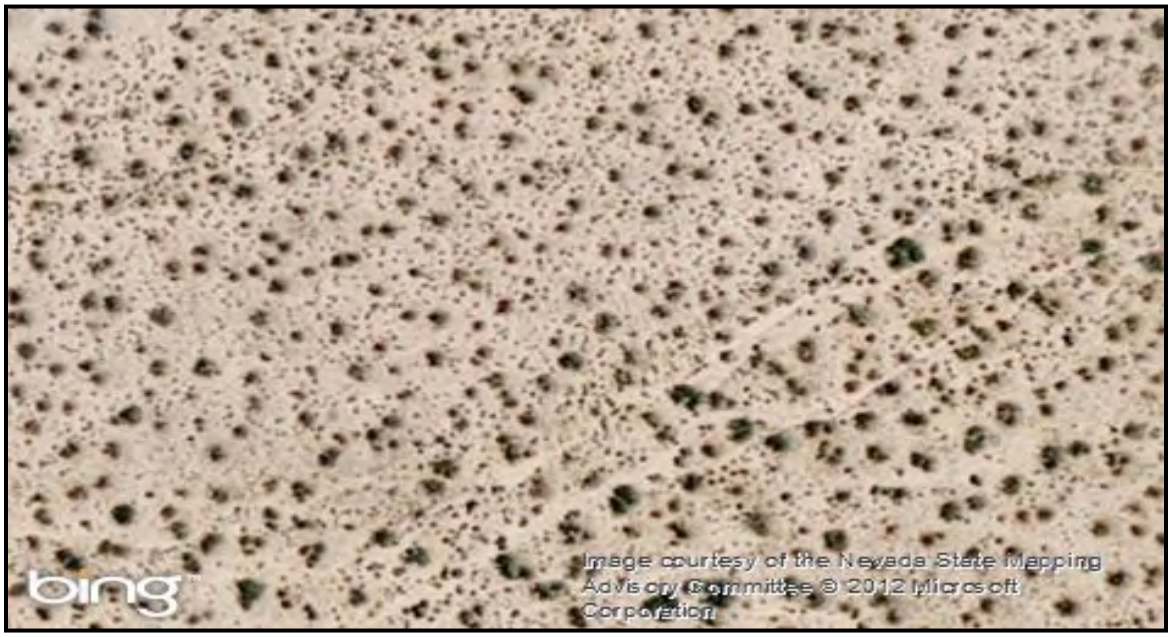

North subareas




South subareas

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

Creosote bush – White bursage scrub Alliance




The photo 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 boundaries are not shown.

The green, medium-height *Larrea tridentata*, seen here with yellow flowers, dominates the entire landscape of this image over a variable cover of smaller, light blue-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.

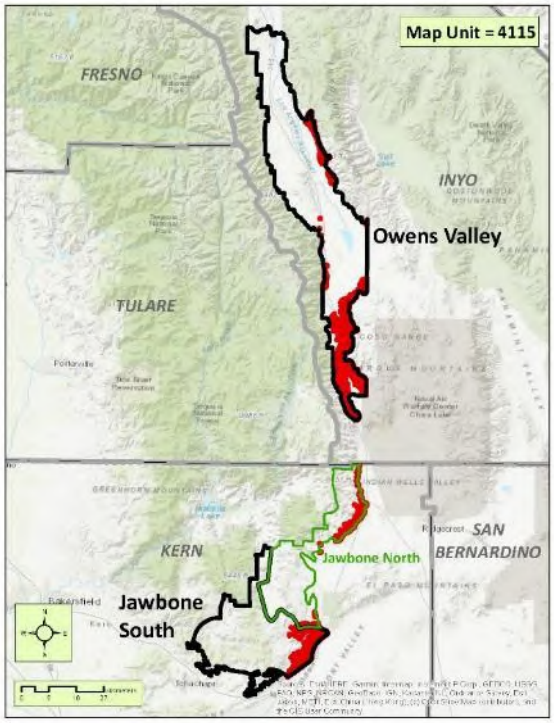
**PHOTOINTERPRETATION SIGNATURE:** Stand structure is two-tiered, made up of the medium height *Larrea tridentata* over the smaller subshrub *Ambrosia dumosa*. *L. tridentata* has a brown to green signature color with a diffuse crown edge, while *A. dumosa* has a light gray or brown signature color with 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. In the Colorado Desert, the upper limits to this Alliance are either defined by topography (steeper slopes) and/or substrate color (dark pavement or volcanic rock), while lower margins often are defined by high degrees of human disturbance.

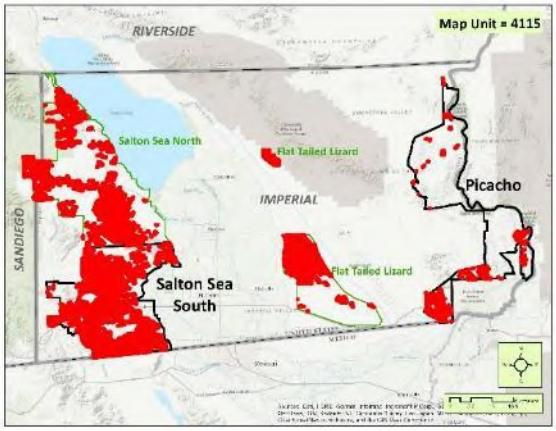
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *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* 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, photointerpreters 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, photointerpreters 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 in the Colorado Desert 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.*

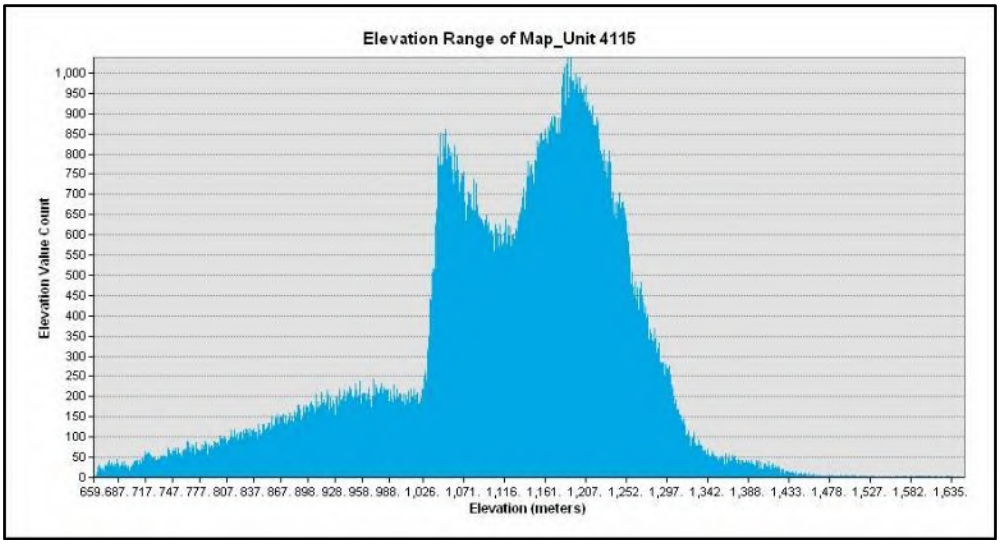
***Larrea tridentata – Ambrosia dumosa* Alliance (4115)**



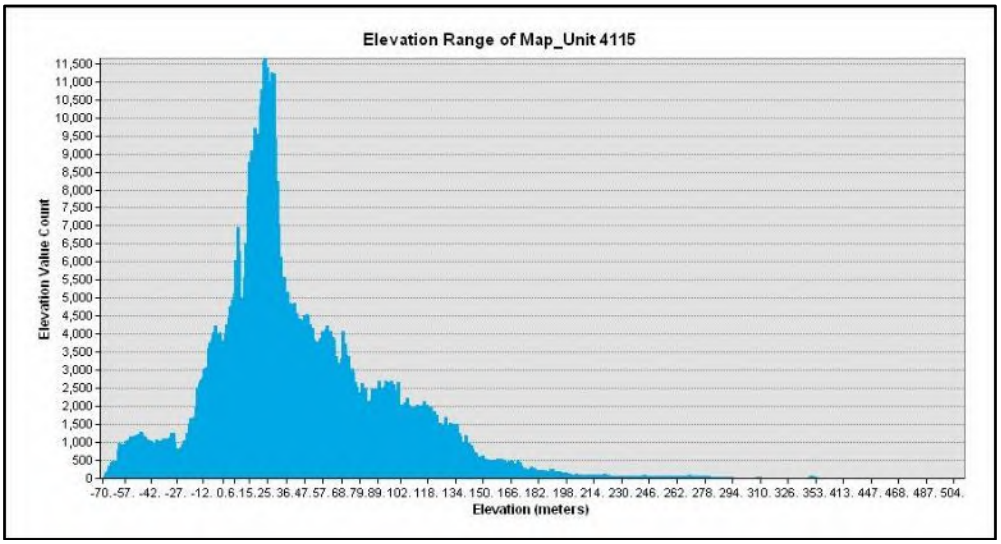




**DISTRIBUTION:** This is the most common type found across the DRECP and occurs on a wide variety of settings. Stands are absent from much of the Transverse Ranges. In the Colorado Desert, this Alliance is primarily found in the alluvial fans and flats but is replaced by the *Larrea tridentata – Encelia farinosa* Alliance on upper fans and adjacent mountain slopes. In the current study area, this Alliance is mapped throughout the Salton North and South and Flat-Tailed Horned Lizard subareas; on lower elevations in the Picacho subarea; on the eastern edges of the desert foothills of the southern Sierra Nevada in the Jawbone North and South subareas; and on the alluvial fans east of the Owen River floodplain, fans surrounding Owens Lake, fans adjacent to Haiwee Reservoir, and surrounding the Rose Valley bottom, all in the Owens Valley subarea.

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




North subareas

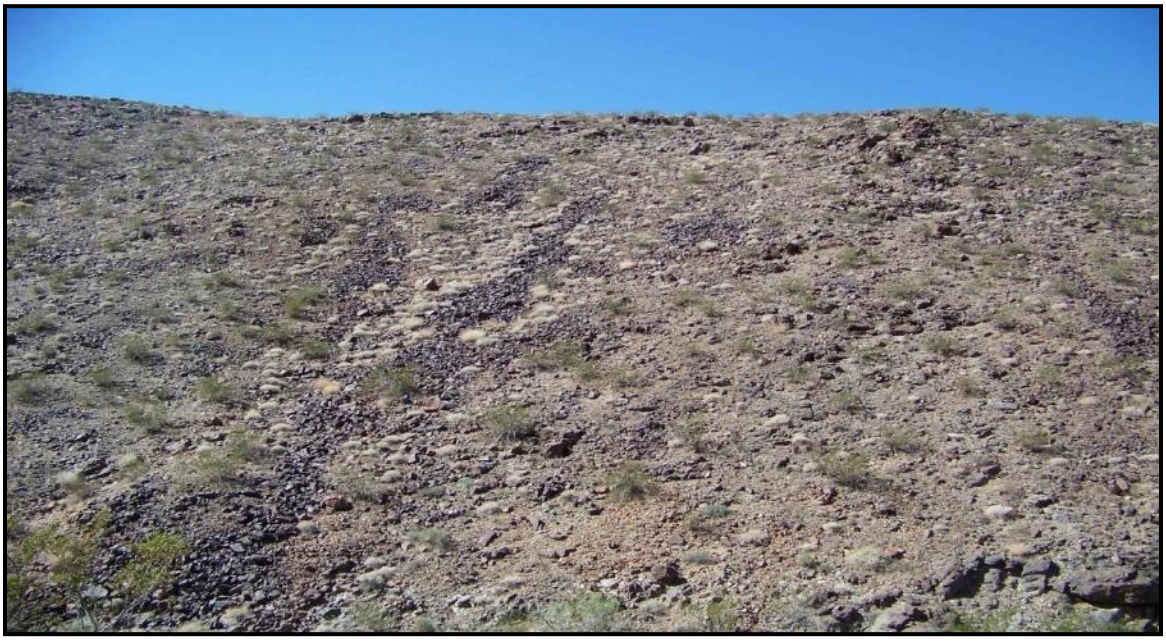



South subareas

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

Creosote bush – brittle bush scrub Alliance


In this 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. Note: This screenshot is a portion of a larger polygon whose boundaries are not shown.



This example shows an open south-facing hill slope of *L. tridentata* and *E. farinosa* co-dominating on a gravelly substrate.

***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*, *Simmondsia chinensis*, and *Krameria grayi.* In rivulets between pavements, any number of species, including *Hyptis emoryi, Acacia greggii, Ambrosia dumosa,* and *Krameria grayi,* 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. In portions of the Central and Eastern Mojave, stands may be found on hot south-facing slopes and are commonly associated with dark volcanic rock. This dual Alliance becomes even more common in the mountains of the Colorado Desert portion of the study area. Here the Alliance can be found on almost all topography, where it is most widespread on darker-colored volcanic substrate and adjacent pavement surfaces.

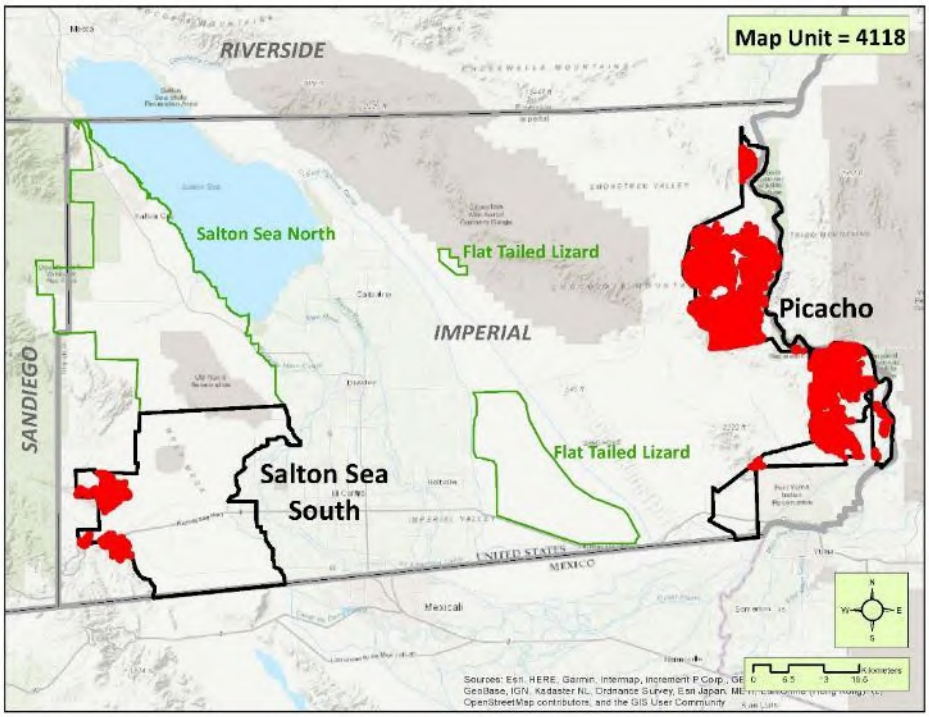
**PHOTOINTERPRETATION SIGNATURE:** Stands range from sparse to moderately dense in cover, with emergent medium-height *Larrea tridentata* consistently spaced over a subshrub layer of *Encelia farinosa*. *L. tridentata* appears green to brown in color with a diffuse crown edge. *E. farinosa* has a small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

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

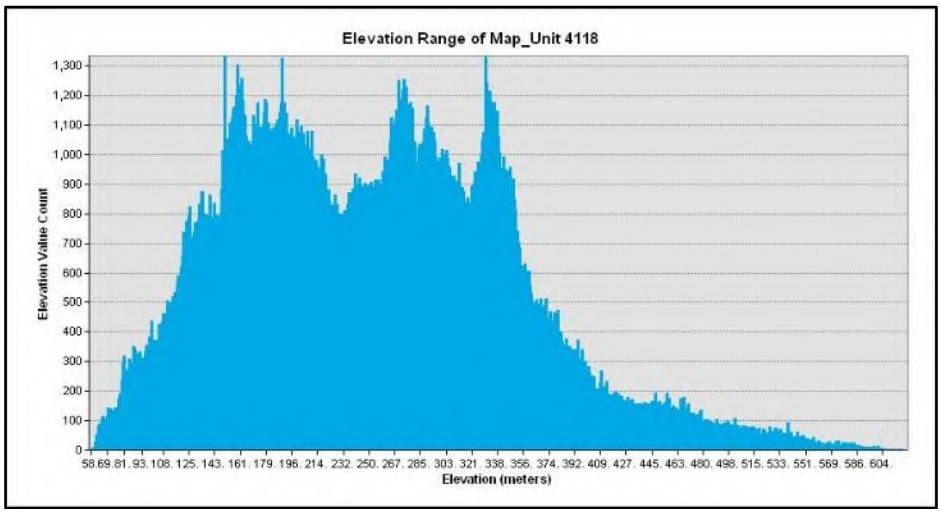
- *Cylindropuntia bigelovii* (4124) - Stands where this cactus species dominates contain only small amounts of *Larrea. C. bigelovii* signature is significantly darker than *Encelia* and crown size somewhat smaller. Stands are generally found on lower-positioned slopes. Patterning and stand distribution of the cactus appears swarm-like.
- *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. Photointerpreters 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 the Colorado Desert, stands are somewhat more common on broad alluvial fans and bajadas, generally downslope from mountain toe slopes and older highly dissected fans and pavement surfaces. 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 a few stands in the southern Searles 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 Valley, preferring mid and upper south- and west-trending exposures. In the current study area, this Alliance is mapped throughout the Picacho subarea; and only in the Coyote Mountains and the upper fans of the Yuha Desert adjacent to the Jacumba Mountains south of Ocotillo, in the Salton Sea South subarea.



## *Lepidospartum squamatum* Alliance (4212)

Scale broom scrub Alliance

The image shows brownish *Lepidospartum squamatum* shrubs occurring in a typical wash setting with emergent *Populus fremontii*.

In the foreground of the photo is a *Lepidospartum squamatum* shrub occupying a low-energy wash, although it prefers high-energy washes.

***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 this *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. Where *Baccharis salicifolia* co-dominates, such as in Caliente Creek, then the stand is mapped to *Lepidospartum squamatum* Alliance.

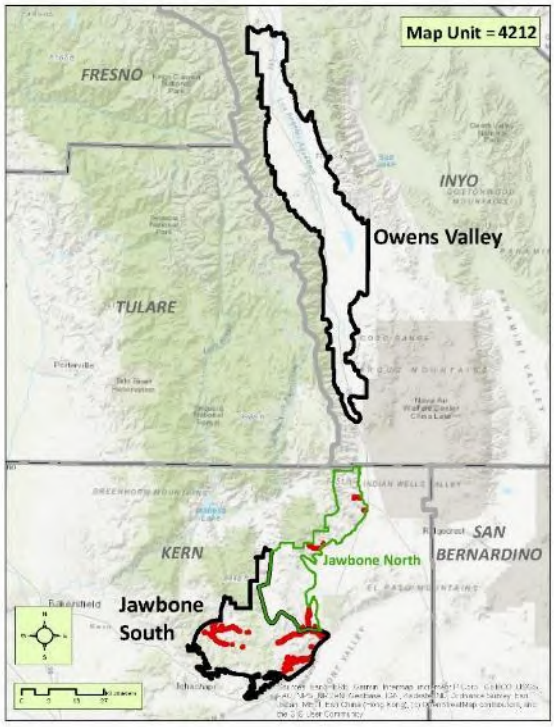
**PHOTOINTERPRETATION SIGNATURE:** Stands range from sparse to moderately dense in cover, with a color variation from brown to brownish green to gray. *L. squamatum* is a small to medium-sized shrub with a rounded to irregular crown shape and rough, uneven texture. It consistently occurs in the most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

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

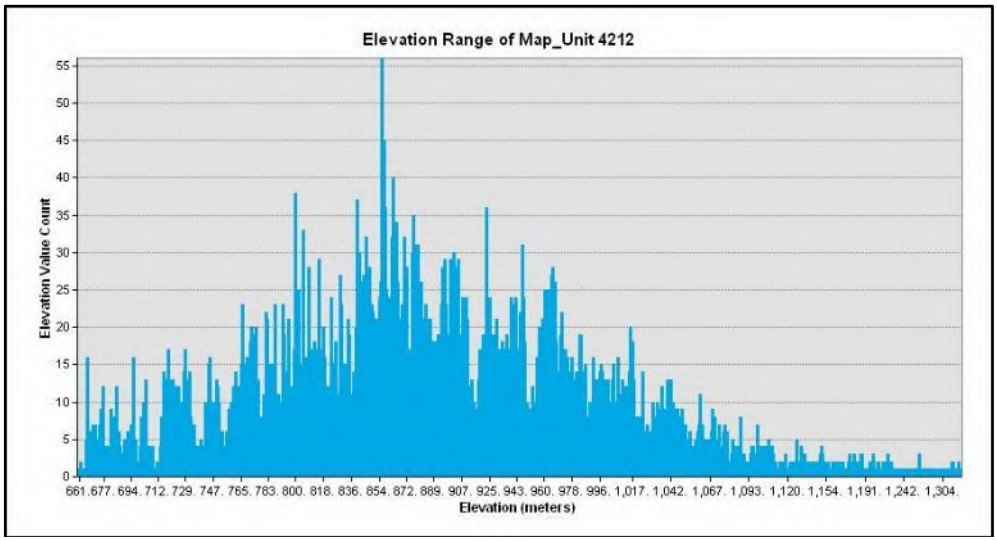
- *Ambrosia salsola – Bebbia juncea* Alliance (7211) – These shrubs are significantly smaller in size, have a lighter gray color, and occupy stream terraces and lower energy washes.
- *Baccharis emoryi – Baccharis sergiloides* Alliance (1423) – *B. sergiloides* typically occurs nearby to desert springs or dammed ponds where water may be at or nearer to the surface. *Lepidospartum* and *E. paniculata* will grade into these stands along the drier end of the tributary, making it difficult to determine relative cover within the transition zone. *B. sergiloides* has a slightly taller stature and is typically greener in cover. However, where surface water is limited and/or plants are drought stressed, the crowns can appear duller and gray, complicating the signature recognition even more.
- *Baccharis salicifolia* Alliance (1422) –Both *B. salicifolia* and *L. squamatum* occur in and along the active channel of high energy washes, such as Caliente Creek, and can have a similar brown to yellow-green signature. *B. salicifolia* is a taller shrub with a wispy less defined crown margin, compared to the stark crown edge of *L. squamatum*. Stands inter-finger with one another in a clustered mosaic alternating in dominance, making it difficult to determine relative cover dominance of each within a stand and harder to delineate dominant stands of each that are larger than the minimum mapping unit.

- *Ericameria nauseosa* Alliance (5212) – In most settings, *E. nauseosa* and *L. squamatum* typically occur adjacent to one another, with *E. nauseosa* on the drier margins of the riparian terrace and the *L. squamatum* along the more active channels. However, in disturbed floodplain settings, such as Caliente Creek, attributed to active grazing and/or impacted by other human disturbances (i.e. flood control or OHV activity), the typical distribution patterns and signature characteristics of the species may be altered, and complicate photo interpretation as well as predictive modeling. *E. nauseosa* typically appears dark gray in color, but color and crown definition may widely vary relative to the health of the plant.
- *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 setting. This species tends to occur in lower-energy washes with smaller watersheds.
- *Prunus fasciculata – Salazaria mexicana* Alliance (7212) – *Prunus fasciculata* has a consistent greener color, typically mixes with a variety of other shrubs, and prefers less active parts of drainages (i.e. stream terraces or sheet wash areas).

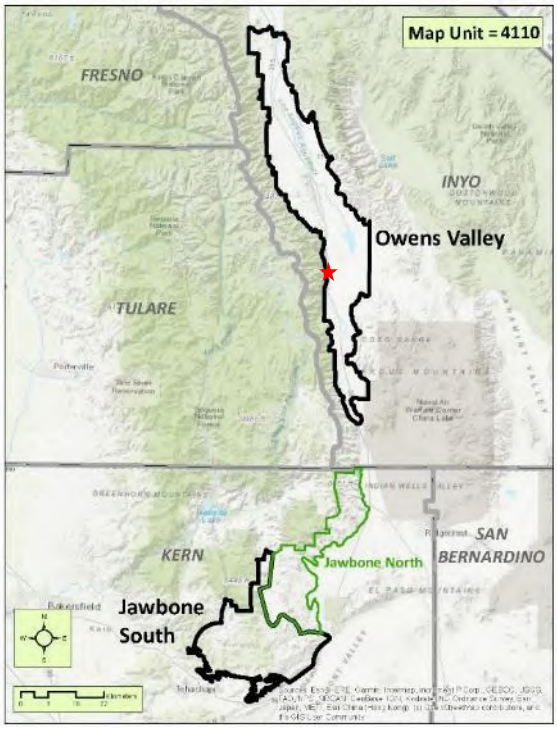
***Lepidospartum squamatum* Alliance (4212)**

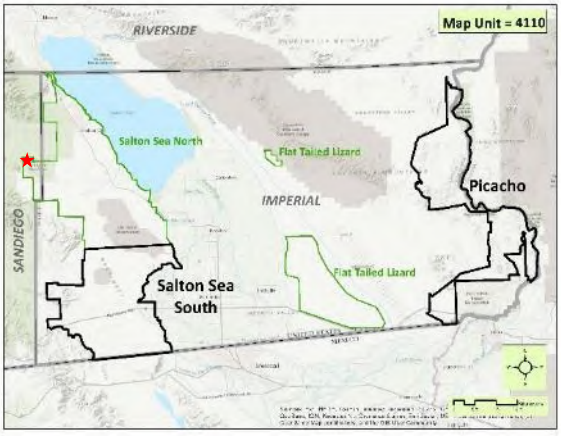



**DISTRIBUTION:** Stands are concentrated along washes on the eastern base of the southern Sierra Nevada, San Bernardino and San Gabriel Mountains. The Alliance also occurs in wide, very active washes in scattered sites within the Central Mojave Desert as far as the Lava Mountains. In the current study area, *Lepidospartum squamatum* is mapped on the floodplains of Caliente Creek and Indian Creek in the interior southern Sierra Nevada in the Jawbone South subarea, as well as the several desert foothill canyon bottoms in the southern Sierra Nevada of the Jawbone North and South subareas.



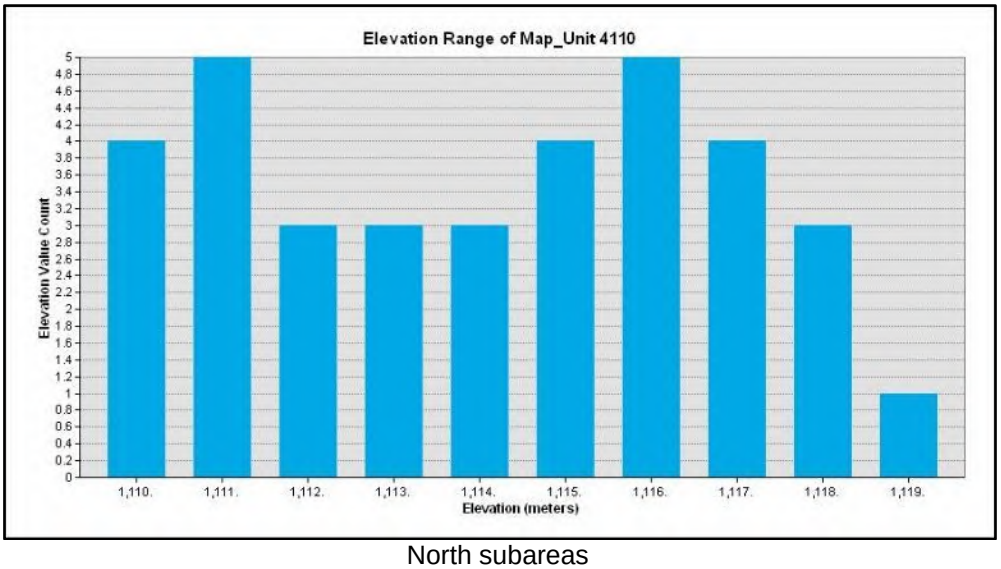
## Lower bajada and fan Mojavean-Sonoran desert scrub Group (4110)



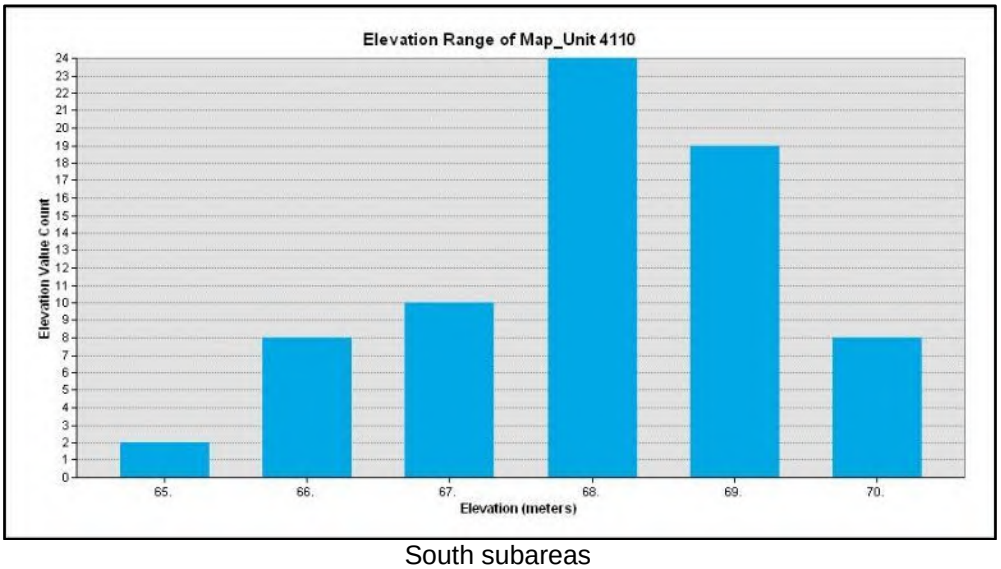




**DISTRIBUTION:** Stands are mapped to the Group level because a definitive signature is not discernible from the imagery at finer levels in the hierarchy. This may be due to the successional or fragmented nature of the stands encompassed within a minimum mappable area. Polygons are mapped to this Group based on field data, In the current study area, one polygon (represented as a star) was mapped in Palo Verde Wash at the confluence of San Felipe Creek in the Salton Sea North subarea; and one polygon (represented as a star) was mapped at a former borrow pit disturbance on the alluvial fan west of Owens Lake in the Owens Valley subarea

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




North subareas




South subareas

## *Parkinsonia microphylla* Provisional Alliance (4152)

Foothill palo verde shrubland Provisional Alliance

In this example, *Parkinsonia microphylla* co-dominates with *Encelia farinosa*. Note: This screenshot is a portion of a larger polygon whose boundaries are not shown.

The photo depicts a stand of low stature *Parkinsonia microphylla* on dark rocky slopes.

***Parkinsonia microphylla* Provisional Alliance (4152)**

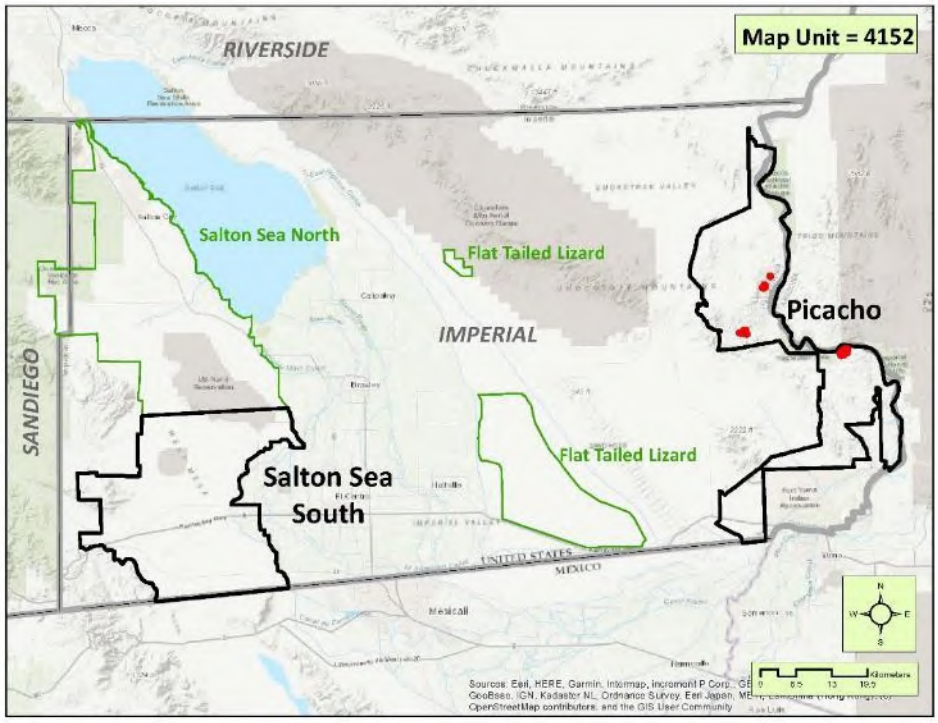
**DESCRIPTION:** *Parkinsonia microphylla* is a spiny shrub or small tree reaching 8 meters in height. *Parkinsonia microphylla* is a co-dominant in the shrub or low tree canopy. *Larrea tridentata* and *Encelia farinosa* frequently co-dominate the lower shrub canopy. Stands of this Provisional Alliance reach their westernmost limit in the Whipple Mountains, the easternmost part of California (Sawyer et al., 2009). In the mapping area, stands frequently occur on unconsolidated gently to moderately sloping foothill settings. Noteworthy to these stands are the widely scattered saguaro cactus (*Carnegiea gigantea)* that randomly dot the landscape. At least fifty individuals were noted in these stands during the mapping effort.

**PHOTOINTERPRETATION SIGNATURE:** Stands are easily identifiable by the relatively high consistent cover of the tall *P. microphylla* shrub contrasting with the relative dark-colored substrate. This species of palo verde is similar in appearance to *P. florida* except that it is significantly smaller in size and is found on nearly all slope characteristics in low foothill settings. Overlap between the two species occurs only in larger wash settings that bisect the foothills. In these cases, the presence of *Olneya tesota* places it into the riparian *Parkinsonia florida – Olneya tesota* Alliance. *Encelia farinosa,* which frequently occurs in relatively high cover with this type, is easily recognizable against the darker-colored substrate.

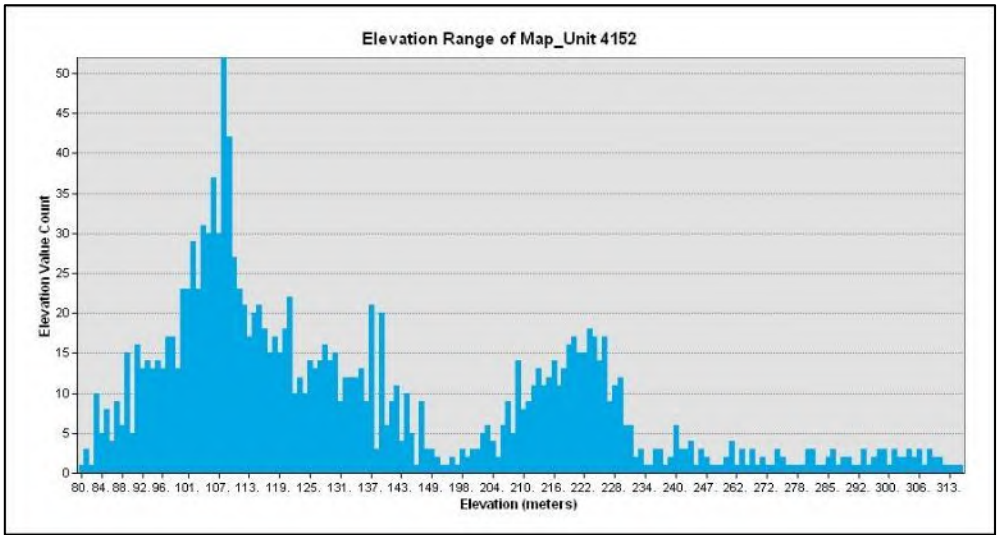
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Larrea tridentata* Alliance (4119) – Larger healthier (greener) *Larrea* shrubs can overlap slightly in size with *P. microphylla.* Spacing and shrub cover density in the upland terrain is not as consistent across the stand as that of *P. microphylla.* Stands dominated by *Larrea tridentata* also are more common on impervious upper fan surfaces. Stands of *Larrea* in the on toeslopes and foothills adjacent to *P. microphylla* and tend to have significantly smaller crowns.
- *Parkinsonia florida – Olneya tesota* Alliance (4227) – The two species of palo verde are for the most part inseparable based on image signature alone. However, of the two, only *P. microphylla* occupies an upland setting. When the two species overlap in medium to small washes, look for other riparian species, especially *Olneya tesota,* to aid in placing the stand in this riparian Alliance.

***Parkinsonia microphylla* Provisional Alliance (4152)**




**DISTRIBUTION:** The distribution of this Alliance is limited to the foothills of the mountains, just upslope from the Colorado River. These are most likely the only stands that occur in the state. In the current study area, 8 polygons were mapped in the Chocolate Mountains of the Picacho subarea.



## *Pluchea sericea* Alliance (4221)

Arrow weed thickets Alliance


In this example, *Pluchea sericea* grows in dense thickets hugging the edges of a channelized watercourse.

This photo portrays *Pluchea sericea* growing in a thicket at the low-lying base of a slope along the margins of the Colorado River Floodplain.

***Pluchea sericea* Alliance (4221)**

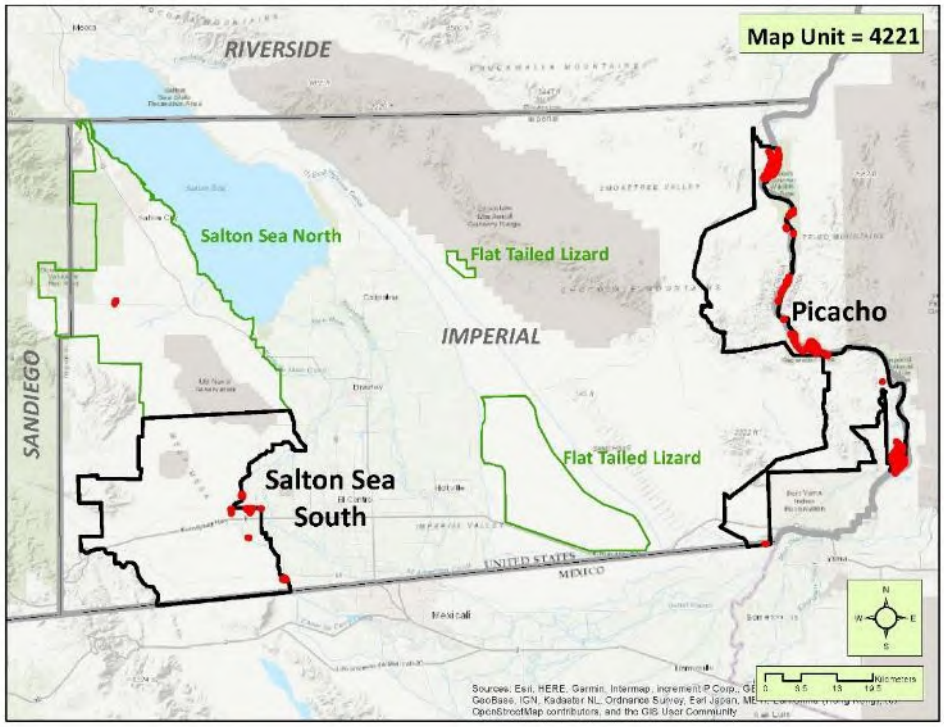
**DESCRIPTION:** In stands of this Alliance, *Pluchea sericea* is present in the canopy with at least 2 percent absolute cover and no other shrub species having equal or greater cover. *Baccharis salicifolia, Atriplex* spp., and *Ericameria nauseosa* are among the other shrubs that may be present. Stands occur around springs, seeps, irrigation ditches, canyon bottoms, stream sides, and seasonally flooded washes. Stands are found abundantly on the Colorado River floodplain on alkaline terraces adjacent to *Prosopis glandulosa, Suaeda moquinii*, *Tamarix* spp., and occasionally freshwater marsh stands.

**PHOTOINTERPRETATION SIGNATURE**: Stand cover ranges from sparse to very dense. Dense stands may appear as a fine-textured thicket, varying minimally in height. Disturbance from clearings and flooding may lead to seasonal dieback. Mature individuals have narrow crowns. In dense, thicket-like settings, signature color is characteristically blue-green except in areas experiencing a high rate of plant senescence, where colors tend to be gray.

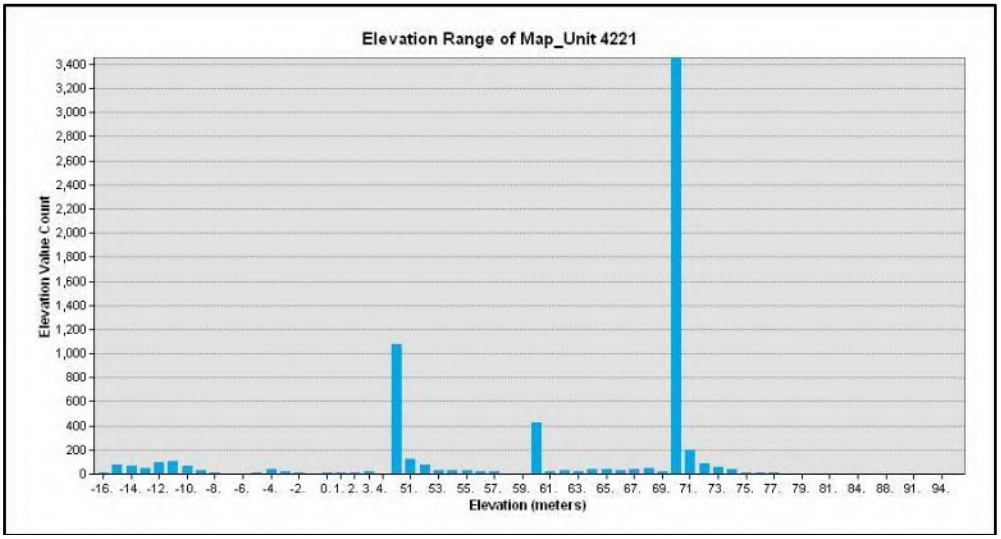
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Atriplex canescens* Alliance (5111) – In stands occurring nearby or adjacent to *Pluchea sericea,* this Alliance is found in settings and cover almost identical to *Atriplex lentiformis.*
- *Atriplex lentiformis* Alliance (3722) – These shrubs often occur in adjacent stands and prefer drier sites on alkaline soils, often in post disturbance clearings. Shrub cover is generally lower, with visible patches of bare ground.
- *Atriplex polycarpa* Alliance (4113) – Stands dominated by *A. polycarpa* occur in upland settings. Crowns are generally rounded with a more distinct edge. Cover densities between the two types overlap considerably; however, *A. polycarpa* is commonly open and is never found in thicket-like settings. Stands of *A. polycarpa* are more common near and on old agriculture fields on less active portions of the Colorado River floodplain.
- *Tamarix* spp. Semi-natural Stands (1432) – This type is primarily distinguished by their taller size and rusty brown tints in portions of the stand. Overall signature texture is not as smooth and is more variable across the stand. Stands of *Pluchea* are somewhat more restricted to perennial sources of water such as irrigation canals and stream margins.

***Pluchea sericea* Alliance (4221)**




**DISTRIBUTION:** *Pluchea sericea* is found along the Colorado River and along the major canals edging the Salton Sea Trough. In the current study area, *Pluchea sericea* is mapped along a number of sites on the Colorado River floodplain in the Picacho subarea; in one stand at Tarantula Wash in the Salton Sea North subarea; and several stands along the Westside Canal, Salt Creek, and Bullhead Slough in the Salton Sea South subarea.



## *Prunus fasciculata – Salazaria mexicana* Alliance (7212)

Desert almond Bladder sage scrub Alliance

This example shows a narrow run of *Prunus fasciculata* following a drainage at the base of rocky hills to the left.

The green shrub dominating this photo is *Prunus fasciculata* in a grassy, post disturbance setting.

***Prunus fasciculata – Salazaria mexicana* Alliance (7212)**

**DESCRIPTION:** This Alliance is mapped where *Prunus fasciculata* or *Salazaria mexicana* dominate or co-dominate the shrub layer and comprises at least 2 percent of the absolute cover and at least 25 percent of total relative cover. For the DRECP, this Alliance may be divided into a *Prunus fasciculata* Sub-alliance, and a *Salazaria mexicana* Association.

For the *Prunus fasciculata* Sub-alliance, *Gutierrezia sarothrae* and *Lycium cooperi* may have up to twice the cover. If *Prunus fasciculata* co-occurs with other tall shrubs such as *Acacia greggii*, it must have twice the cover of other species to make the Alliance definition. Stands are usually found at upper elevations (above 1000 meters/3280 feet) and in well-defined mountain canyons or valley bottoms. Typically stands occur in washes and arroyos on upper fans, but they 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.* This Sub-alliance often occurs adjacent to stands of *Eriogonum fasciculatum, Grayia spinosa*, and also occurs adjacent to *Artemisia tridentata* stands near the base of the San Gabriel Mountains.

For the *Salazaria mexicana* Association, other shrubs, if present, each comprise less than half of the cover of *S. mexicana,* with the exceptions of *Ambrosia salsola, Eriogonum fasciculatum, Hyptis emoryi, Senna armata* or *Salvia dorrii,* which may have higher or equal cover. *Salazaria* stands are mostly restricted to sandy or gravelly washes in terrain where fire has been minimal, but may occur on post burn or in other disturbed steep and rocky uplands. In washes, *Salazaria mexicana* often occurs with *Ambrosia salsola, Bebbia juncea, Eriogonum fasciculatum* or *Senna armata.* On rocky slopes *Salazaria mexicana* 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 stands of this type may 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. Stands of *Salazaria mexicana* are largely limited to the Mojave Desert Ecoregion and the adjacent southern Great Basin. They are not known from the Colorado Desert, although the species ranges south to Texas and New Mexico**.**

**PHOTOINTERPRETATION SIGNATURE:** *Prunus fasciculata* stands range from sparse to moderately dense in cover with rounded, well-defined dark green to dark gray crowns. Plants form winding linear patterns following arroyos and canyon bottoms. In a post fire setting shrubs vary greatly in cover density, patterning, and texture, and tend to spread out beyond the immediate wash channel.

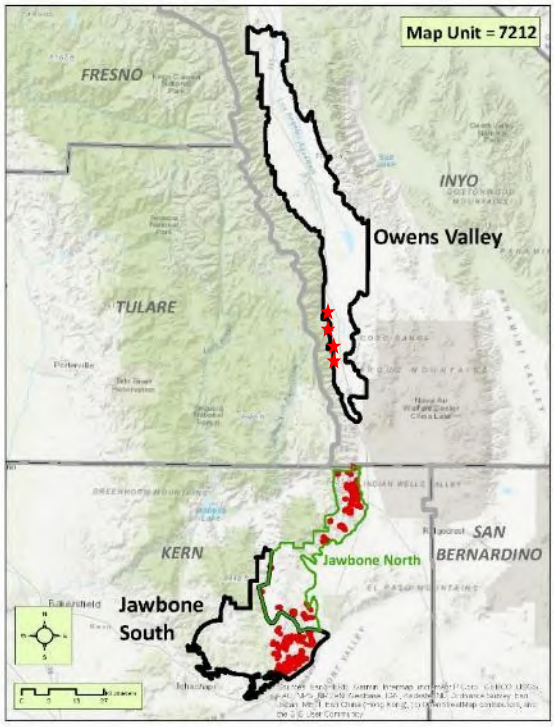
***Prunus fasciculata – Salazaria mexicana* Alliance (7212)**

*Salazaria mexicana* **s**hrubs tend to have a rounded crown, often coalescing into small clonal patches. Signature color trends gray to bluish green. In sparser settings, especially on rocky slopes, it is difficult to separate out from other shrubs in the stand. Geographic and environmental factors are generally the most reliable way to identify stands within this type. On burned, rocky, lower to middle slopes dissected by small ravines containing concentrations of vegetation, *S. mexicana* is expected to have significant cover, even though other small stands may be present.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

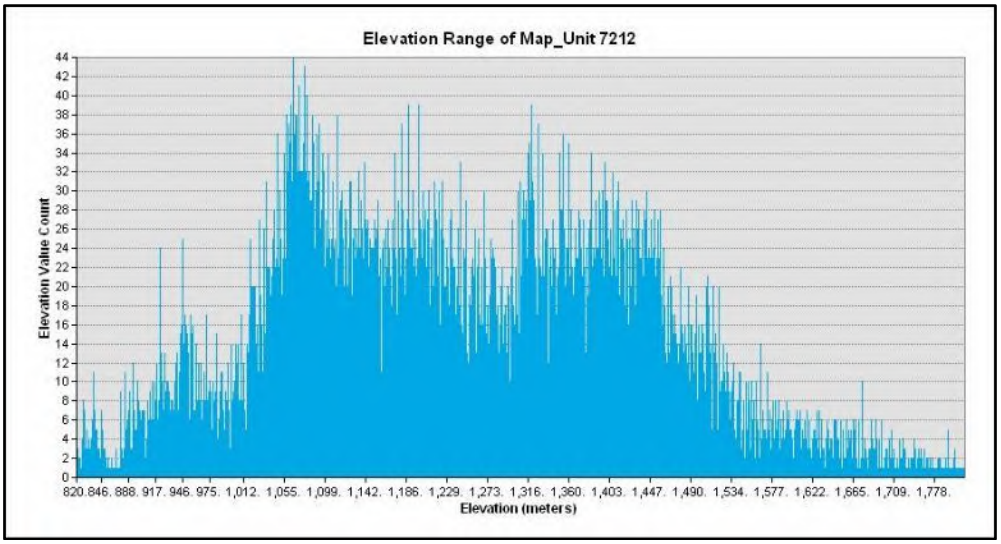
- *Acacia greggii – Hyptis emoryi – Justicia californica* Alliance (4226) – Higher elevation stands dominated by catclaw *(Acacia greggii)* overlap in elevation with the *Prunus fasciculata* Sub-alliance. Color differences between the two species are minimal but separation is aided by differences in setting. *A. greggii* is more frequently limited to wash margins and tends to grow more often in long narrow bands. Distribution of *P. fasciculata* within the wash is more random.
- *Ambrosia salsola – Bebbia juncea* Alliance (7211) – These shrubs are lighter gray in color than *Prunus fasciculata* and have a smaller, more diffuse crown. *A. salsola* has a smaller crown and trends a darker brown; *Salazaria mexicana* generally has a bluish green color. Stands of vegetation within this Alliance may occur in similar settings in broad, low energy washes. *Ambrosia salsola* generally is found in less rocky settings and more commonly occurs after land has been scraped or cleared.
- *Encelia (actoni, virginensis) – Viguiera reticulata* Alliance (5211) – Stands dominated by *E. virginensis* were observed in post burn settings generally upslope from *Salazaria mexicana* on steeper terrain. This model did not always replicate from one desert mountain range to the next, and separating out this type remains extremely difficult. Cover is generally very sparse, and overall sparseness is accentuated in the signature by the extremely small and light gray-colored crown of *E. virginensis.*
- *Ephedra nevadensis* Sub-alliance of the *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419) – In post disturbance environments, both *Ephedra nevadensis* and *Salazaria mexicana* can form dense cover. However, the cover characteristics of *S. mexicana* are generally less consistent across large areas, and plants are more confined to low-energy washes and the adjacent floodplain.
- *Ericameria paniculata* Alliance (4213) – Shrubs tend to occur more frequently in broader washes downslope, often adjacent to broad fans and bajadas. Otherwise these plants are difficult to distinguish from *Prunus fasciculata* due to their similar crown shapes, texture, and setting.
- *Lepidospartum squamatum* Alliance (4212) – These shrubs are distinguished by having a lighter tone and browner color than *Prunus fasciculata*. They occur in active portions of the wash.

***Prunus fasciculata – Salazaria mexicana* Alliance (7212)**




**DISTRIBUTION:** *Prunus fasciculata* is primarily found in upland washes and canyons in foothills of the San Bernardino and eastern San Gabriel Mountains. This species prefers higher precipitation and cooler temperatures than other wash vegetation types and is absent from the Colorado Desert and much of the lower elevation valleys of the Mojave Desert. A few localized stands do occur within cooler, protected canyons in mountain ranges of the Mojave Desert. *Salazaria mexicana* occurs along washes and arroyos on alluvial fans and along steep north-facing slopes and protected canyons in the northern Mojave Desert. Extensive stands are also found in post burn settings on mountains in the Central Mojave Desert. This species is not mapped in the Colorado Desert. In the current study area, the *Prunus fasciculata – Salazaria mexicana* Alliance is mapped on upper alluvial fans above Haiwee Reservoir in the southern Owens Valley subarea (represented on the map as stars); and in canyons of the desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas.

***Prunus fasciculata – Salazaria mexicana* Alliance (7212)**



## *Psorothamnus fremontii – Psorothamnus polydenius* Alliance (4219)

Fremont's and Nevada smokebush Alliance

*Psorothamnus arborescens* occurs here in a mixed shrub stand on a sandy substrate in Owen's Valley.

The photo displays the indigo inflorescences of *Psorothamnus arborescens* in a mixed shrub stand occurring on a sandy substrate in the Owens Valley.

***Psorothamnus fremontii – Psorothamnus polydenius* Alliance (4219)**

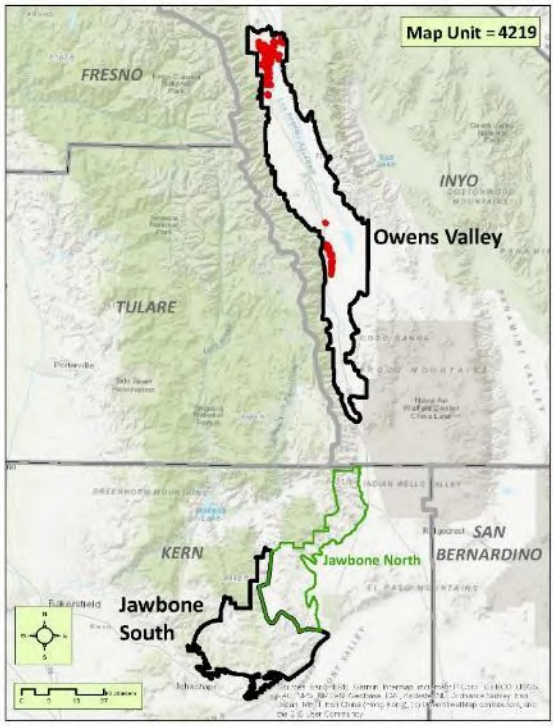
**DESCRIPTION:** In this Alliance, *Psorothamnus arborescens, P. fremontii, P. polydenius, P. schottii, or Sarcobatus baileyi* is dominant or co-dominant in the shrub canopy. Stands are often on volcanic alluvium or lava flows and may be an artifact of disturbance (e.g., grazing, flooding, fire), or they occur in low-energy sandy washes or along sand dunes (with disturbance from its shifting substrate. Primarily found in the northern portions of the Owens Valley on sandy substrate on the lower fans & bajadas both east and west of the Owens River

**PHOTOINTERPRETATION SIGNATURE:** Shrubs are generally fairly large in size and give off a fairly uniform signature across the stand. Substrate characteristics are also uniform with minimal rockiness. Stands tend to occur upslope from alkaline vegetation and below typical Mojave Desert scrub types.

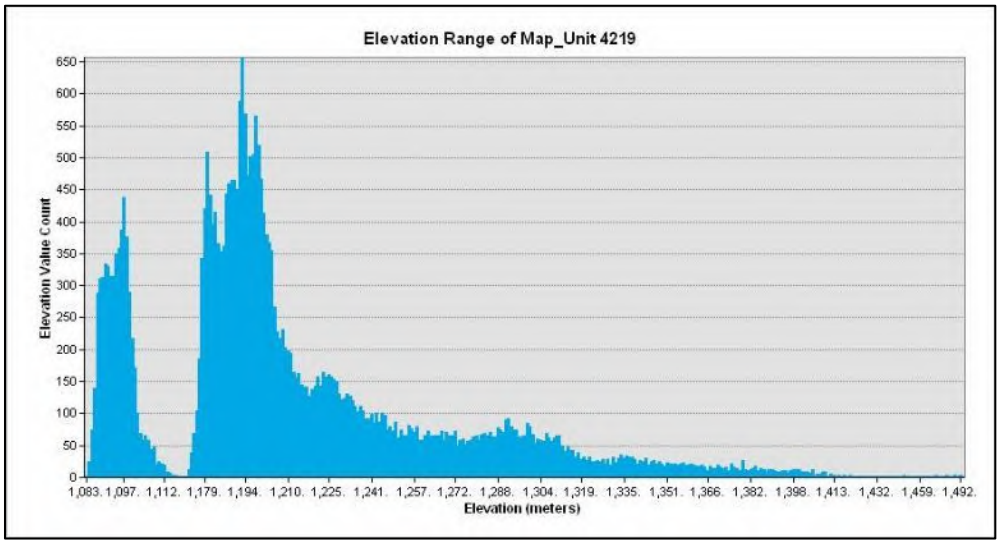
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Atriplex canescens* (5111) – This species occurs in similar settings where the substrate is sandy. *A. canescens* yields a more bluish signature but color alone is not a reliable indicator. Stands with *A. canescens* are often adjacent and may mix with *Psorothamnus.* Examples east of the Owens River can also be in close proximity to *A. polycarpa.*
- *Ericameria nauseosa* (5212) – Stands dominated by this shrub are often found adjacent, but downslope on finer substrate. Disturbance characteristics (clearing and plowing) are more frequent in stands dominated by *E. nauseosa.* In most cases, the *Ericameria* yields a more intense light blue color.

***Psorothamnus fremontii – Psorothamnus polydenius* Alliance (4219)**




**DISTRIBUTION:** In the current study area, *Psorothamnus* is mapped on the lower alluvial fans adjacent to the lava flows in northern Owens Valley, and on the west edge of Owens Lake, both in the Owens Valley subarea.



## *Purshia tridentata – Artemisia tridentata* Alliance (5422)

Bitter brush – Big sagebrush scrub Alliance


*Purshia tridentata* dominates the emergent shrub layer in this example over a shorter understory of *Eriogonum fasciculatum.* Note: This screenshot is a portion of a larger polygon whose boundaries are not shown.

In this example, *Purshia tridentata* occurs on a higher elevation fan with a sparse emergent cover of *Yucca brevifolia.* A rather dense cover of annual grasses is established in this post fire stand.

***Purshia tridentata – Artemisia tridentata* Alliance (5422)**

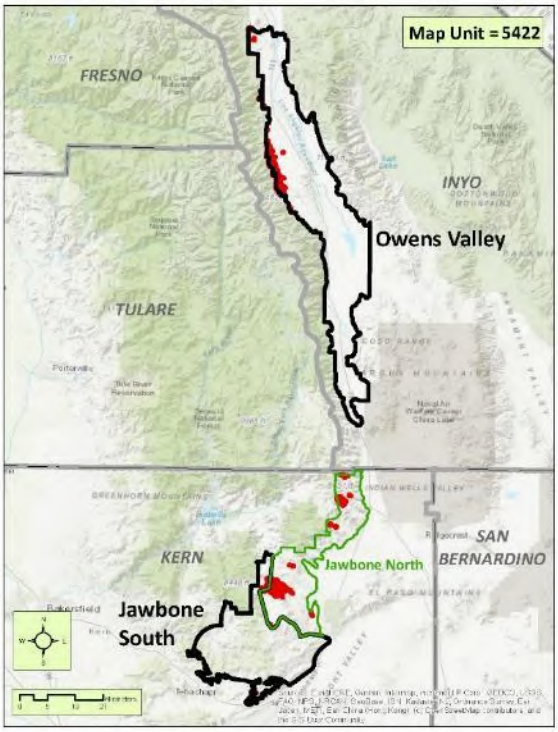
**DESCRIPTION:** In stands of this Alliance *Purshia tridentata* or *P. glandulosa* constitutes at least 2 percent absolute cover and in most cases comprises higher relative cover than any other single shrub. *Purshia* may co-dominate with *Artemisia tridentata*. When *Purshia tridentata* co-dominates with smaller early seral shrubs such as *Eriogonum fasciculatum, Hesperoyucca whipplei, Encelia actoni,* and *Ericameria linearifolia* in the understory shrub layer (post burn *Juniperus californica* or *Pinus monophylla* stands), the Alliance is mapped to *P. tridentata.* Small, linear, lower-elevation stands occur on rocky terraces and irregularly flooding episodic stream channels north the San Gabriel Mountains.

**PHOTOINTERPRETATION SIGNATURE:** *Purshia tridentata* is a medium-sized shrub with a rounded to irregularly shaped crown that has a signature color similar to that of the California juniper. In most stands, the cover of *P. tridentata* varies considerably and always contains a low shrub understory layer, usually of *Eriogonum fasciculatum*. The signature color of the emergent *Purshia* shrubs contrasts dramatically with the brown hues of the smaller *Eriogonum* shrub layer. Most stands were mapped in post fire settings, where understory annual grasses yielded a typical yellow-tan color, which contrasted with the brighter, sparsely vegetated substrate of the adjacent unburned vegetation.

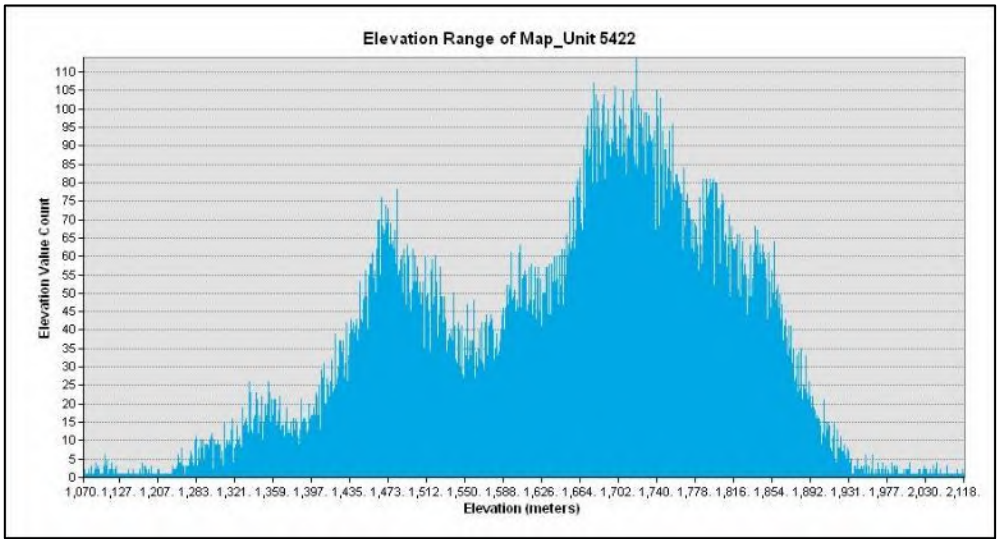
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Juniperus californica* Alliance (1122) – *Juniperus californica* typically has a much larger crown and is more consistently rounded. Individual trees are significantly taller and yield definitive shadowing. Unlike stands within the *Purshia tridentata* Alliance, most juniper stands are not found in post fire settings, and therefore generally do not have an early recovery shrub layer. The contrasting understory layers in both of these types are an important factor in helping differentiate their typical disturbance-related settings and thus aid in discriminating between the two Alliances.
- *Prunus fasciculata – Salazaria mexicana* Alliance (7212) – Although *Prunus fasciculata* is not exclusive to wash environments, where the two types occur in proximity to each other, *Prunus* is more likely to be found in the washes. *Prunus fasciculata* has a darker signature with less of a green hue. Shrubs are generally larger and less rounded.

***Purshia tridentata* – *Artemisia tridentata* Alliance (5422)**




**DISTRIBUTION:** *Purshia tridentata* occurs in three distinct areas of the study: in the San Gabriel Mountains toeslopes near the Piñon Hills and Phelan area, along the toeslopes of the San Bernardino Mountains south of Fifteenmile Valley, and in the foothills of the eastern Sierra Nevada. In the current study area, *Purshia* is mapped on the upper western alluvial fan from Crater Mountain to Diaz Creek in the Owens Valley subarea; and in the desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas north of Jawbone Canyon.



## *Quercus john-tuckeri* Alliance (3312)

Tucker oak chaparral Alliance


In this image, stands of *Quercus john-tuckeri* form an emergent canopy over an understory of *Eriogonum fasciculatum. Q. john-tuckeri* increases in cover in protected settings, especially toward the right side of the image. Note: This screenshot is a portion of a larger polygon whose boundaries are not shown.

The darker green *Quercus john-tuckeri* dominates the tall shrub and low tree canopy with minor amounts of *Juniperus californica* (bright green) over a discontinuous small shrub layer on an undulating upper alluvial fan.

***Quercus john-tuckeri* Alliance (3312)**

**DESCRIPTION:** In this Alliance, *Quercus john-tuckeri* is dominant, or is co-dominant and evenly distributed across the stand. It can intermix with *Juniperus californica* at similar or higher cover. *Q. john-tuckeri* tends to occur on drier mesic settings in shallow ravines and lower side slopes. In these settings, a variety of shrubs, such as *Arctostaphylos glauca, Ceanothus cuneatus, Cercocarpus montanus, Garrya flavescens, Ericameria linearifolia, Ericameria cooperi, Adenostoma fasciculatum,* and *Eriogonum fasciculatum*, may be present at low cover in the shrub layer. Stands are found along the northern fringe of the Transverse Ranges and in the southern Sierra Nevada. *Q. john-tuckeri* tend to hybridize with *Quercus douglasii* as *Quercus x alvordiana*, and for mapping purposes, the stand is assigned to the *Quercus john-tuckeri* Alliance when the structural characteristics of the vegetation appear more shrub-like. If more tree-like, then it is mapped as *Quercus douglasii* Alliance.

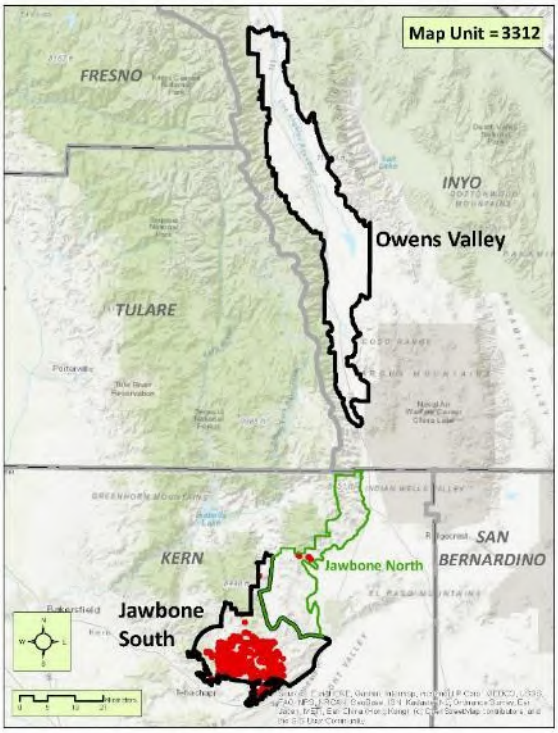
**PHOTOINTERPRETATION SIGNATURE:** *Quercus john-tuckeri* is a medium to large shrub with a well-defined crown. Crowns vary in size and height, and tend to have a dark gray color with a brownish or slightly green tint. *Q. john-tuckeri* cover varies considerably across the stand and among other *Q. john-tuckeri* stands in locations nearby. There is almost always a small shrub layer, making the overall vegetative cover of this Alliance quite high. In many stands, there is a component of *Juniperus californica,* which can be identified by the more consistently rounded crown and brighter green signature. More open stands at lower elevations can have a component of *Yucca brevifolia,* which readily separates this type from other scrub oak Alliances.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

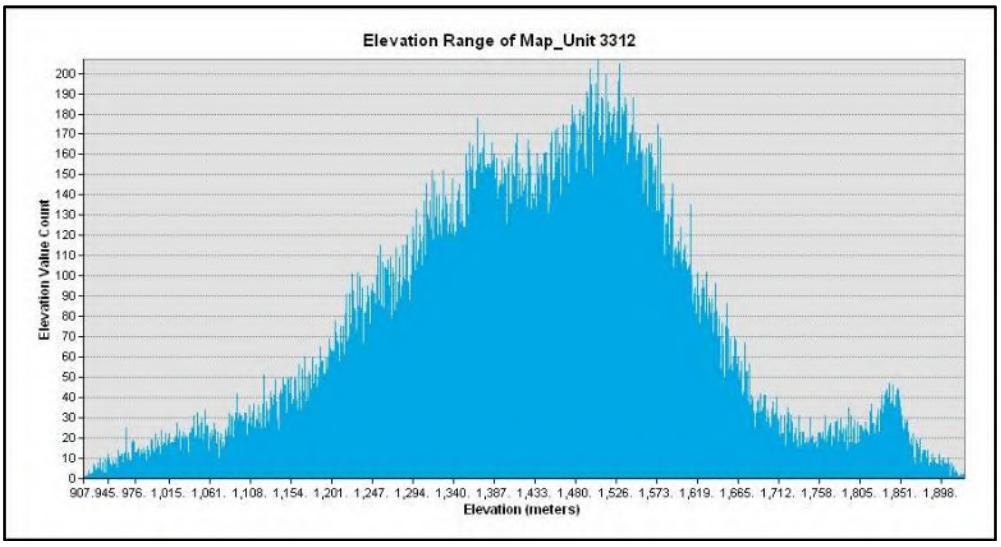
- *Cercocarpus montanus* Alliance (2131) – *Cercocarpus montanus* and *Quercus john-tuckeri* stands occur together in a transitional area with *C. montanus* in a mid to upper elevation zone (3000-5000') in the Piute Mountains. The *C. montanus* medium-sized crowns are wispy and thin with a dull gray or grayish green color. Usually, in more open stands, signatures between the two species are fairly distinct, with *Q. john-tuckeri* displaying broader, denser crowns. However, the signature confusion arises in high cover, diversely mixed stands where signatures blend together creating a complex mosaic of texture and color. The Whitewater Creek area exemplifies these diverse chaparral settings, where other mixed species include *Garrya flavescens, Arctostaphylos viscida*, and *Fremontodendron californicum*.
- *Juniperus californica* Alliance (1122) – Mixing of these two species is fairly common and occurs over a significant portion of their range, generally on more level and less undulating topography. Overall, *J. californica* is found at slightly lower elevations. *Juniperus californica* has a fairly regular rounded crown in both smaller and large individuals; crown shape is more irregular in *Q. john-tuckeri*. Signature color overlap between the two species is minimal with *J. californica* being almost always a brighter green.

- *Quercus wislizeni* Alliance (1114) – *Quercus wislizeni* stands overlap with *Q. john-tuckeri* in two narrow transitional zones, climbing in elevation away from desert margins into the higher elevations of the study between Tollgate Canyon and Sugarloaf Mountain, and along the Pacific Crest Trail near the east end of Back Canyon and Miller Springs. *Quercus wislizeni* typically have broader crowns with a greener color than *Q. john-tuckeri*. Both can occur on multiple aspects, vary in size and cover, although *Q. wislizeni* will occupy more mesic canyon concavities and protected slopes, with the *Q. john-tuckeri* occurring on the adjacent slightly more xeric and exposed side slopes. Along the drier edges of its range, where *Q. wislizeni* exhibits die-back in its crown, the trees appear grayer and can confuse signature recognition by blending into *Q. john-tuckeri* stands.

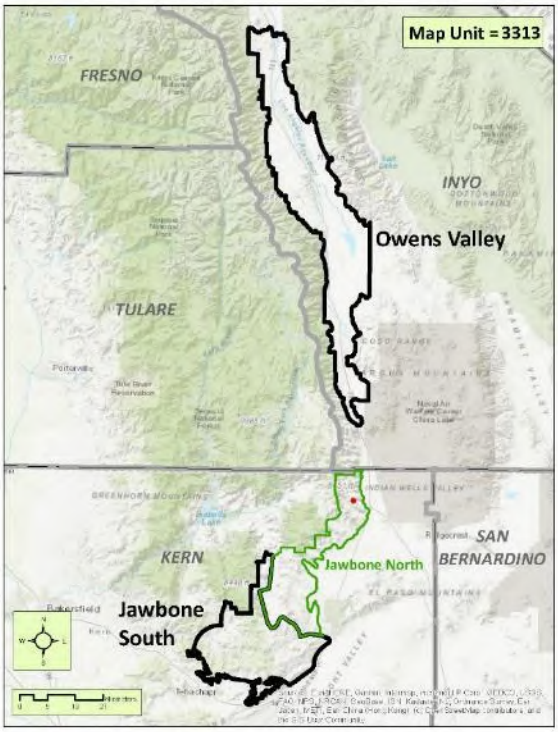
***Quercus john-tuckeri* Alliance (3312)**




**DISTRIBUTION:** *Quercus john-tuckeri* is found in a narrow swath along the Transverse Ranges, as well as in the southern Sierra Nevada. In the current study area, *Quercus john-tuckeri* is mapped primarily in the interior of the southern Sierra Nevada in the Jawbone South subarea. It is also mapped in a few locations in the desert foothills overlooking the Fremont and Indian Wells Valleys of the Jawbone North and South subareas.



## 3313 – *Quercus palmeri* Alliance




**DISTRIBUTION:** Stands of this Alliance were infrequently mapped in the study area. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project. One polygon was mapped in the Jawbone North subarea. Note: since the completion of the mapping, as a result of subsequent classification analysis, the *Quercus palmeri* Alliance has been reassigned as an Association of the *Quercus cornelius-mulleri* Alliance (3314).

**Due to small aerial extent no Elevation Range Chart is provided**

## *Rhus trilobata – Crataegus rivularis – Forestiera pubescens* Alliance (1425)

Desert olive patches Alliance


The photo depicts a foothill stream terrace adjacent to a creek where *F. pubescens* is mixed with the shorter gray *Ericameria nauseosa*. Bordering to the north is a stand of *Populus fremontii* lining the streambed.

This example displays the dense highly branching crown of *F. pubescens* occurring in a small draw at the foot of a hill.

***Rhus trilobata – Crataegus rivularis – Forestiera pubescens* Alliance (1425)**

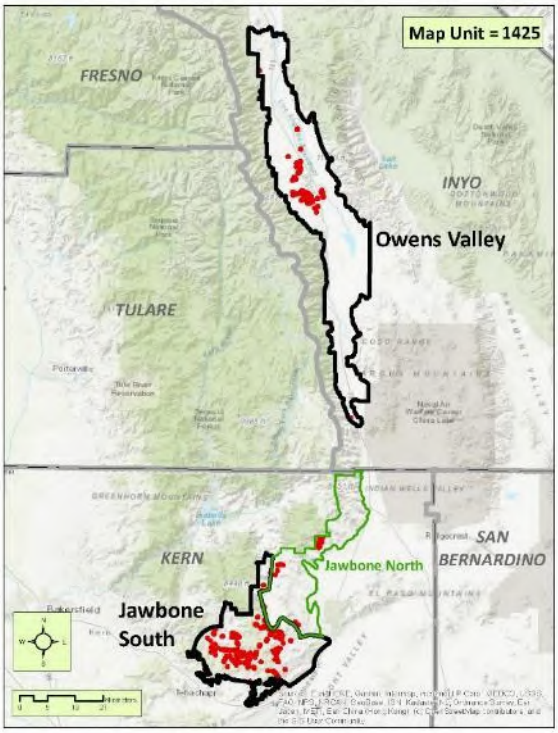
**DESCRIPTION:** *Forestiera pubescens* is the dominant shrub species in the canopy of this Alliance, which is usually found locally around permanent water or subsurface moisture. *Ericameria nauseosa* may co-dominate. In the DRECP, stands occur in the western foothills adjacent to alkaline flats or on steeper slopes and along ravines, and in montane foothill areas around springs or in bottoms of narrow canyons in the foothills of desert mountains, the southern Sierra Nevada, and the Owens Valley. Compared to the *Salix exigua* and *Populus fremontii* Alliances, the *Forestiera pubescens* Alliance seems to prefer slightly drier conditions upslope from flowing water. Stands are usually dense with a sparse understory.

**PHOTOINTERPRETATION SIGNATURE:** Stands may appear open to dense in cover, occupying areas adjacent to washes and small drainages. This medium-to-tall shrub appears bright green with rounded crowns, forming definitive edges along the margins of the stand. High resolution imagery depicts numerous branches radiating from the main stem of individual plants. Young or regenerating stands may coalesce into clonal thickets, forming a stippled dense mat of shrubs. Isolated stands in non-riparian settings are sparse in cover, and individual shrubs have rounded crowns.

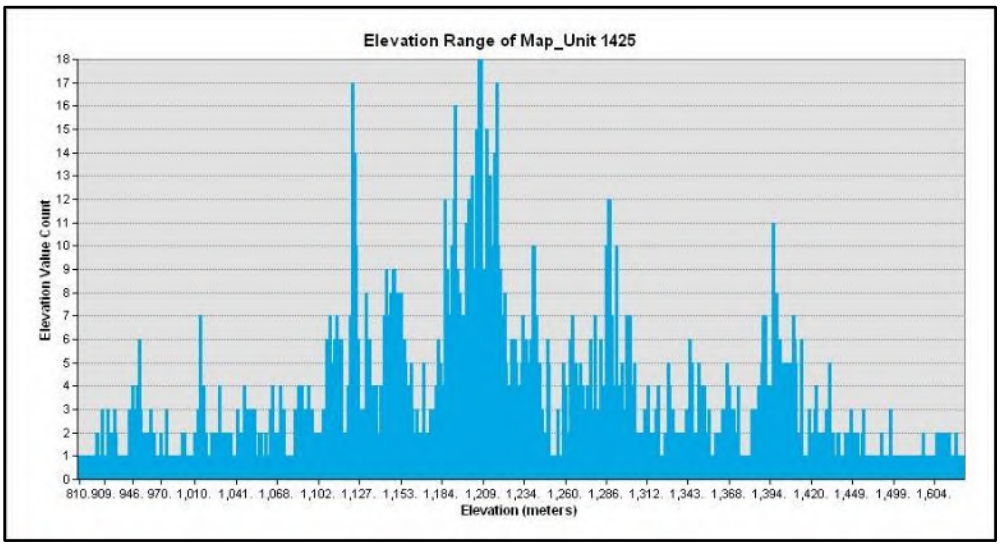
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Ribes quercetorum* Alliance (3211) – Stands of this Alliance have a similar growth form to *F. pubescens*, exhibiting very rounded crowns with well-defined margins that coalesce into clonal thickets. However, *R. quercetorum* occurs in more xeric settings, such as near rock outcrops or along toe/low slope concavities. Color is a muted yellow green with a slightly stippled texture.
- *Salix lasiolepis* Alliance (1427) – This type typically occupies stream bottoms, whereas *Forestiera pubescens* tends to prefer slightly drier conditions upslope from streambeds but in close proximity to subsurface water. Crown branching is less visible, and therefore individual crown texture tends to be smooth rather than stippled.

***Rhus trilobata –Crataegus rivularis –Forestiera pubescens* Alliance (1425)**




**DISTRIBUTION:** Most stands of occur along the western edge of the DRECP. In the current study area, *Forestiera pubescens* occurs in the interior and desert foothills of the southern Sierra Nevada in the Jawbone North and South subareas, and on the Owens River floodplain and tributaries in the Owens Valley subarea.



## *Ribes quercetorum* Provisional Alliance (3211)

Oak gooseberry thickets Provisional Alliance

The aerial photo highlights a moderately dense stand of dominant *Ribes quercetorum* in a protected draw next to a stand of open *Artemisia tridentata* bordering to the south.

This photo shows a dense stand of *Ribes quercetorum* on a moderately steep slightly concave slope, surrounded by *Ericameria nauseosa*.

***Ribes quercetorum* Provisional Alliance (3211)**

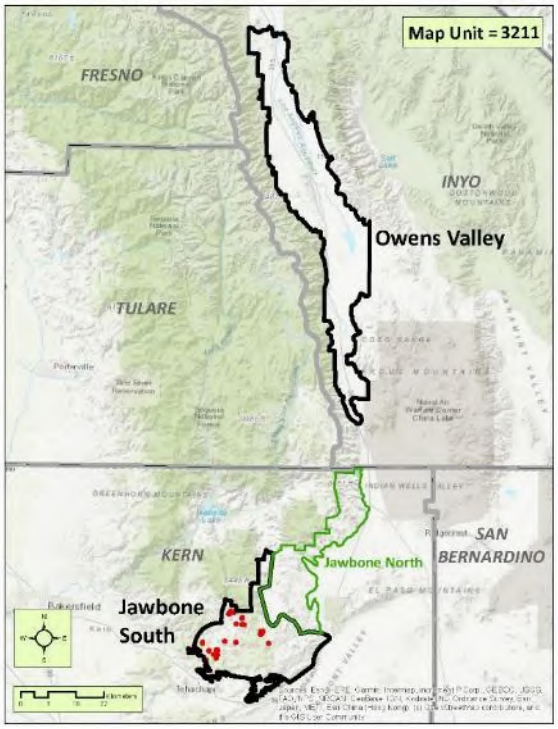
**DESCRIPTION:** *Ribes quercetorum* is the dominant shrub in the canopy, often growing clonally having resprouted recently after fire on steep or concave north facing slopes. This type may also be found around boulders or rock outcrops on more protected slopes. Patches of *Ribes quercetorum* may blend into to stands of *Ceanothus cuneatus*, *Artemisia tridentata*, and/or *Eriogonum fasciculatum*. Stands have been noted between 2000 and 5000 feet in elevation. Typically in small stands of less than 1 acre in the foothills of the Tehachapi Mountains and the southern Sierra Nevada.

**PHOTOINTERPRETATION SIGNATURE:** *Ribes quercetorum* stands appear as rounded muted yellow-green individuals or in irregularly shaped clonal clumps with smooth, even height crown texture. This type typically occurs as small stands with a moderate to dense cover.

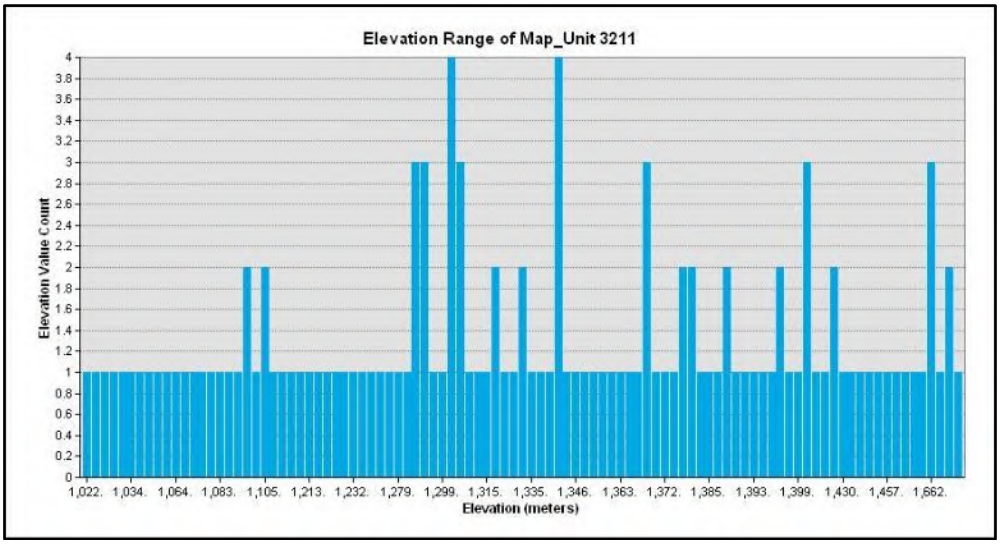
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Rhus trilobata – Crataegus rivularis – Forestiera pubescens* Alliance (1425) –Stands of this alliance have a similar growth form to *R. quercetorum*, exhibiting very rounded crowns with well-defined margins that coalesce into clonal thickets. However, *Forestiera* is found in slightly more mesic settings upslope from flowing surface or subsurface water, and is often associated with other riparian types.

***Ribes quercetorum* Provisional Alliance (3211)**

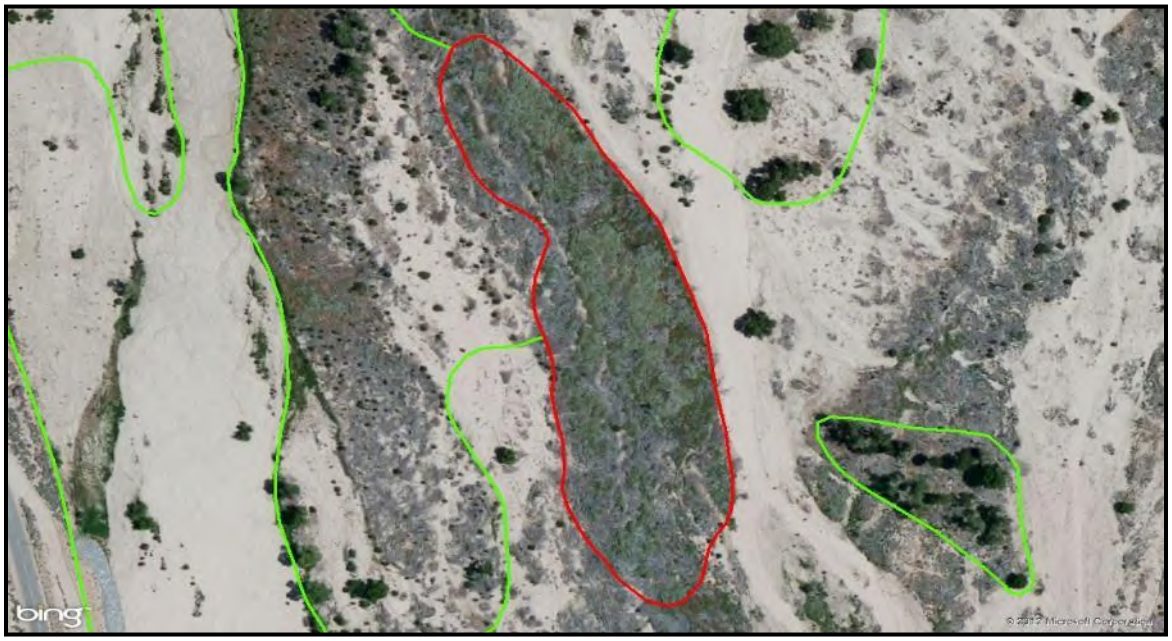



**DISTRIBUTION:** In the current study area, *Ribes quercetorum* is mapped at scattered locations within the interior southern Sierra Nevada.



## *Salix exigua* Alliance (1424)

Sandbar willow thickets Alliance



The image shows the matted blue-gray clumps of *Salix exigua* occupying a broad wash. Dead shrubs and grasses from previous years appear as the shorter, dull gray signature seen mixing in the stand.

This photo gives a close-up view of a flowering *Salix exigua*. *Populus fremontii* is visible in the background on the right side of the photo.

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

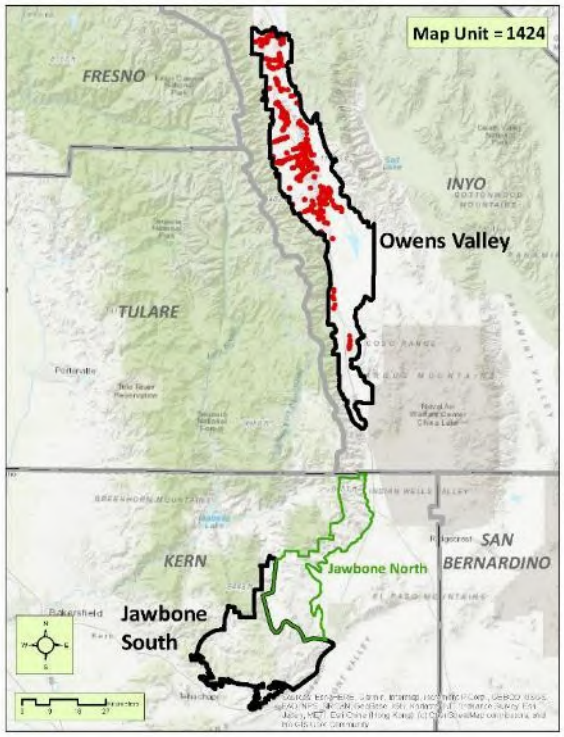
**DESCRIPTION:** *Salix exigua* is characteristically present as a dominant or co-dominant shrub with more than 5 percent absolute cover and greater than 50% relative cover in the shrub layer. *Baccharis salicifolia* may co-dominate. *S. exigua* forms an open to continuous canopy along riparian corridors. 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.

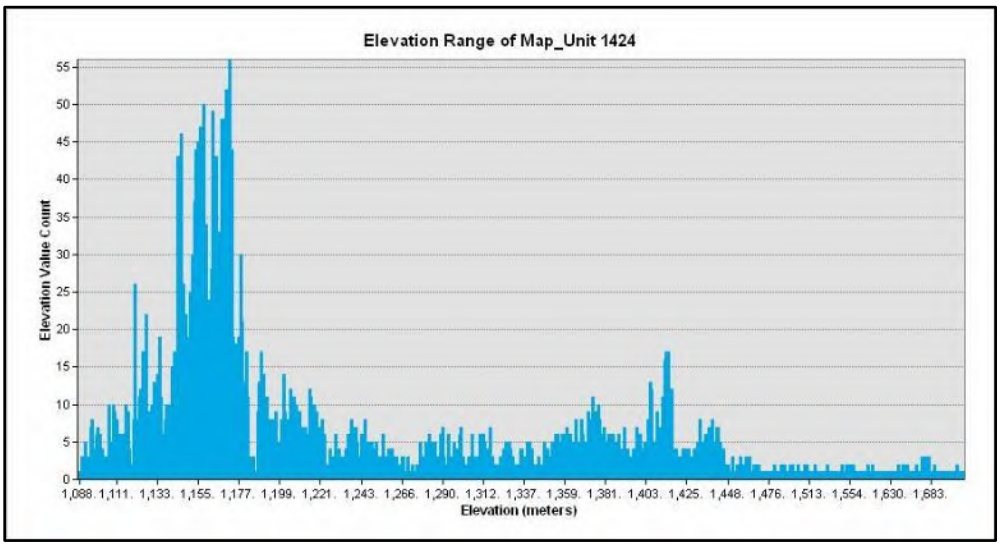
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Baccharis salicifolia* Alliance (1422) – These shrubs grow in similar wash settings but generally have a dark green to dark brown signature color. Stands with sparse cover tend to have a more stippled appearance and are less clumpy and more consistent across the stand.
- *Salix gooddingii – Salix laevigata* Alliance (1416) – Young stands forming thicket-like vegetation often contain a co-dominance of *Salix laevigata* along with other *Salix* species that are not distinguishable from one another. Mature trees are easily recognizable by their characteristic multiple crowning structure and lighter green color.
- *Salix lasiolepis* Alliance (1427) – This species also grows in dense cover along washes, but plants are distinguished by a slightly taller overall crown and dark green signature color.

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




**DISTRIBUTION:** Stands of *Salix exigua* occur along the Mojave River corridor and along larger washes and some small lakes at the western end of the DRECP. In the current study area, *Salix exigua* is mapped in small stands on the floodplain of the Owens River and in tributary streams in the Owens Valley subarea.



## *Salix lasiolepis* Alliance (1427)

Arroyo willow thickets Alliance

In this example, *S. lasiolepis* grows in dense cover, with mature plants attaining a fairly uniform height across the stand. Sparse patches of *Baccharis salicifolia* occur on drier areas of the floodplain along the eastern portion of this stand.

*S. lasiolepis* is seen in this photo growing in dense cover averaging about five meters in height.

***Salix lasiolepis* Alliance (1427)**

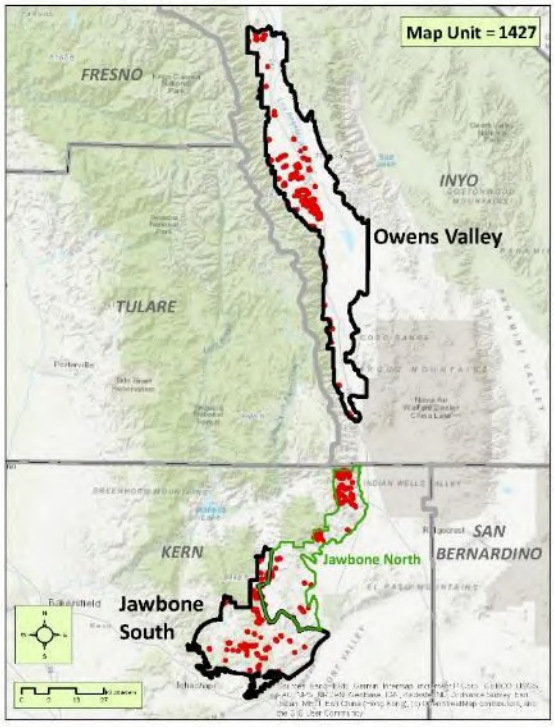
**DESCRIPTION:** In this Alliance *Salix lasiolepis* is dominant. *Salix exigua* or *Baccharis salicifolia* may co-dominate. Considered a shrub even though it may be taller than five meters, *Salix lasiolepis* may be accompanied by other riparian shrubs. Small stands occur adjacent to freshwater streams and drainages in the western portion of the DRECP, usually at the margin of the desert ecoregion. If present, *S. laevigata* is less abundant than *S. lasiolepis,* and *Platanus racemosa, Populus* spp., and *S. gooddingii* all occur with trace cover.

**PHOTOINTERPRETATION SIGNATURE:** Stands characteristically attain a fairly uniform height when mature, usually averaging about five meters. Confusion occurs in thicket settings where several species of young willows may co-occur. In these settings, it is not possible to distinguish *S. lasiolepis* using even the highest-resolution imagery. Colors may be dark green to bright green to yellow during late-season leaf change. Most stands attain dense cover and yield a fairly smooth texture overall. Stand cover may vary due to natural flooding events.

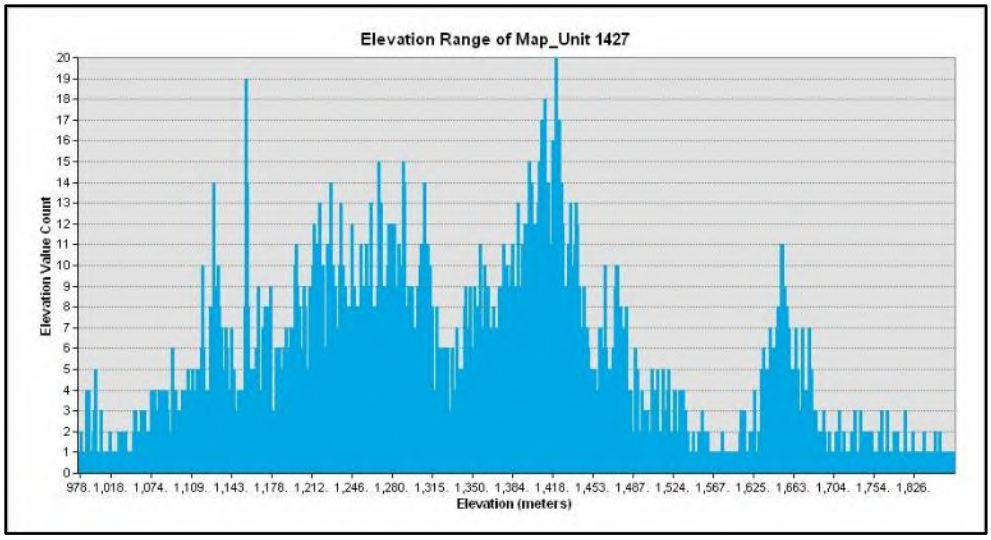
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES**

- *Alnus rhombifolia* Alliance (1511) – This species grows in dense narrow bands in or immediately adjacent to perennial channels, but typically these trees are taller in size and are very rare within the study area.
- *Baccharis salicifolia* Alliance (1422) – These plants generally have a wider range of cover and sandy substrate is often visible in sparser stands. Overall signature color is darker green or trends to a greenish brown, and canopy height is significantly shorter.
- *Rhus trilobata – Crataegus rivularis – Forestiera pubescens* Alliance (1425) – This type tends to occur in slightly drier conditions perched above the bottom of the wash along the terrace or in narrow upland concavities, whereas *S. lasiolepis* occurs directly adjacent to the wash or in stream bottoms. Crowns tend to have radial branching and more rounded margins.
- *Salix exigua* Alliance (1424) – *Salix exigua* can grow in similar cover characteristics but has a distinctive silvery blue or silvery green color.
- *Salix gooddingii – Salix laevigata* Alliance (1416) – Typically these trees are significantly larger, with mature trees displaying multiple crowning. Younger stands are indistinguishable from other willow species. *Salix laevigata* is more likely to occur in spring-fed canyons, and cover is more variable along the stand.

***Salix lasiolepis* Alliance (1427)**

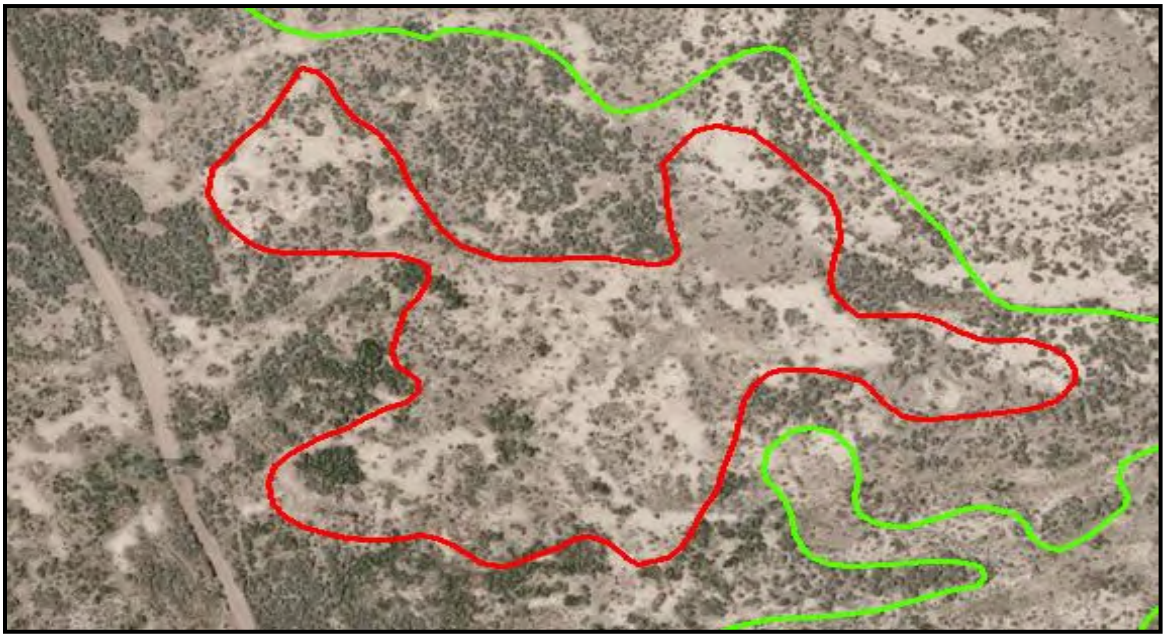



**DISTRIBUTION:** This Alliance is uncommon in the desert and is restricted to larger drainages and protected canyon bottoms in the mountains and foothills at the western edge of the DRECP. In the current study area, *Salix lasiolepis* is mapped in the interior and desert foothills of the southern Sierra Nevada of the Jawbone North and South subareas; and in isolated patches in the Owens River floodplain and along a number of tributaries of the Owens Valley subarea.



## *Sarcobatus vermiculatus* Alliance (5511)

Greasewood scrub Alliance



The aerial photo depicts a *Sarcobatus vermiculatus* stand occurring around light colored mineral deposits in Owens Valley. It is surrounded by a moderately dense stand of *Ericameria nauseosa* and *Atriplex lentiformis*.

This example shows a stand of *Sarcobatus vermiculatus* that is mixed with *Atriplex confertifolia* and *Ericameria nauseosa* in the Owens Valley.

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

**DESCRIPTION:** *Sarcobatus vermiculatus* and/or *Atriplex parryi* dominate or co-dominate the stand at at least 2 percent absolute cover in the shrub canopy. This Alliance includes *Atriplex parryi* and *Chrysothamnus albidus* as Associations.

*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 (less than one hectare) 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 moquinii*, *A. lentiformis* ssp. *torreyi*, or *A. confertifolia* stands.

Stands of the *Atriplex parryi* Association area dominated by *Atriplex parryi,* typically comprising more than 2 percent absolute cover in the shrub canopy and no other species having greater or equal cover. Shrubs are rounded and leaves are white, scaly, and generally elliptic to heart-shaped. Stands occur in alkaline basins on fine-textured soils just upslope from *Allenrolfea occidentalis* stands or downslope from the *Atriplex confertifolia* stands. Stands below MMU have been noted within larger *Atriplex confertifolia* stands, and with *Atriplex spinifera*. Stands are not known south or east of Coyote Dry Lake.

This Alliance includes *Chrysothamnus albidus* (=*Ericameria albida*) where it is 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*.

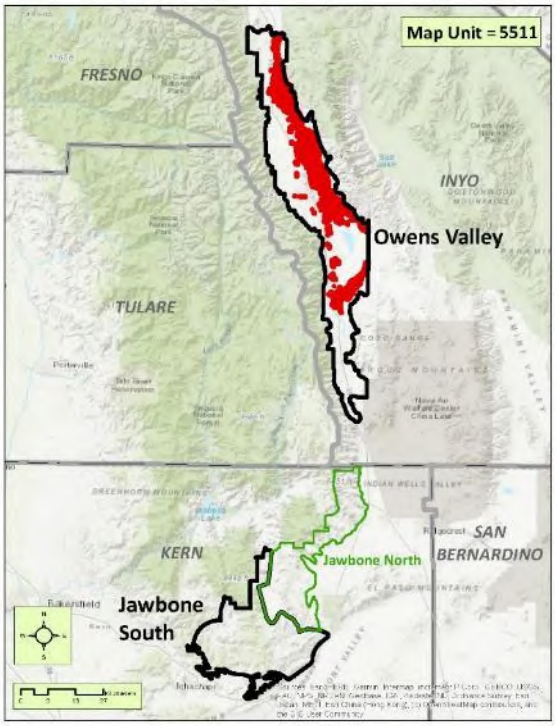
**PHOTOINTERPRETATION SIGNATURE:** Stands of *Sarcobatus vermiculatus* in most cases are easily recognizable by their large size and greenish tint, and frequently occur over a uniform light colored substrate. Stands are often spaced evenly and size can be fairly uniform over large areas. Where stands mix, they generally occur upslope of and are co-dominated by *Atriplex confertifolia.*

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.* The herbaceous layer is sparse, and saline characteristics of the soil yield a highly reflective signature adjacent to the plants. Stands are mapped in local areas where there were field observations of the type.

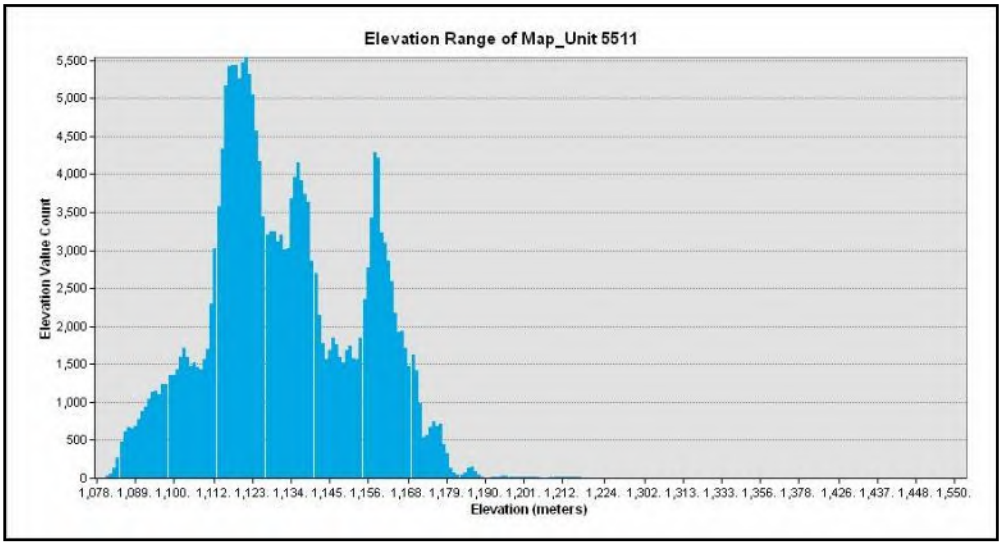
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Allenrolfea occidentalis* Alliance (3721) – Shrubs can sometimes mix with *Atriplex parryi* 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. Although their signatures are similar, for the most part the ranges of *Allenrolfea occidentalis* and *Sarcobatus vermiculatus* do not overlap.
- *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 *Sarcobatus vermiculatus*. *A. confertifolia* is smaller in stature, however their covers may be similar. In addition, stands of A. confertifolia are more diverse, with species, such as *Ambrosia dumosa* and *Psorothamnus arborescens*.
- *Atriplex lentiformis* (3722) – Stands dominated by this species of *Atriplex* often occur nearby on less sandy more playa-like substrate. *A. lentiformis* gives off a more bluish color and cover is more variable across the stand.

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

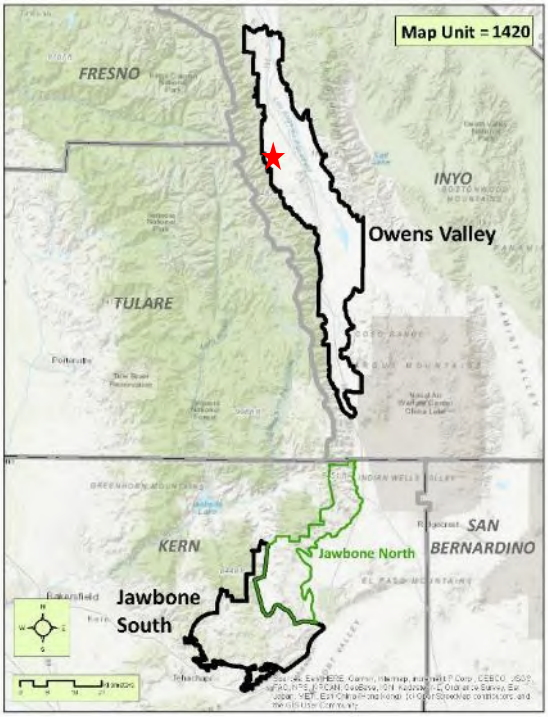



**DISTRIBUTION:** Previously, stands of *Sarcobatus* were infrequently mapped in the DRECP area, and only in the Antelope Valley. *Atriplex parryi* stands occur at China Dry Lake, and below-MMU stands have been noted at Coyote Dry Lake and near California City. In the current study area, *Sarcobatus vermiculatus* Alliance (including *Atriplex parryi)* is only mapped in the Owens Valley subarea throughout the Owens River floodplain, and surrounding Owens Lake.



## Southwestern North American riparian/wash scrub Group (1420)

(Also known as the Great Basin montane riparian shrub Group, or the Western montane-subalpine riparian & seep shrubland Group)




**DISTRIBUTION:** Stands of this Group were infrequently mapped in the Owens Valley subarea. These stands were mapped at the Group level because the Alliance was not discernible from the imagery. One polygon (represented as a star) was mapped on Bairs Creek, and was not visited in the field. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.

**Due to small aerial extent no Elevation Range Chart is provided**

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

Bush seepweed – Alkali goldenbush scrub Alliance

In this example, *Suaeda moquinii* dominates the stand and appears as a dense brownish red color mixed with *Prosopis glandulosa*, *Atriplex polycarpa,* and *Pluchea sericea.*

In this example, *Suaeda moquinii* co-dominates with *Atriplex spinifera*; *S. moquinii* is reddish brown.

***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 confertifolia* or *A. lentiformis* ssp. *torreyi* co-dominate, the Alliance is *S. moquinii – Isocoma acradenia*. If *S. moquinii* and *Allenrolfea occidentalis* co-dominate, the Alliance is the latter.

Stands of *Isocoma acradenia* occur on flat to gentle slopes near salty margins of dry lakes and playas or on episodic alkaline outwash deposits from springs and seeps. Stands may not always be mappable due to their small size and intermixing with *Atriplex confertifolia*, *A. parryi*, and *Suaeda moquinii*. Stands of *Isocoma* in the Salton Trough often form the boundary between the gently sloping alluvial fans of *Larrea tridentata* upslope and the alkaline soils of the Imperial Valley where *Atriplex spp.* and other salt tolerant plants often dominate.

Note: As part of this project effort, additional classification data collection and analysis were performed for the 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). The Salton Sea region, which includes Picacho, Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.

**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. Stands along the Colorado River are very dense and appear as a coarse brown mat of shrubs. 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.

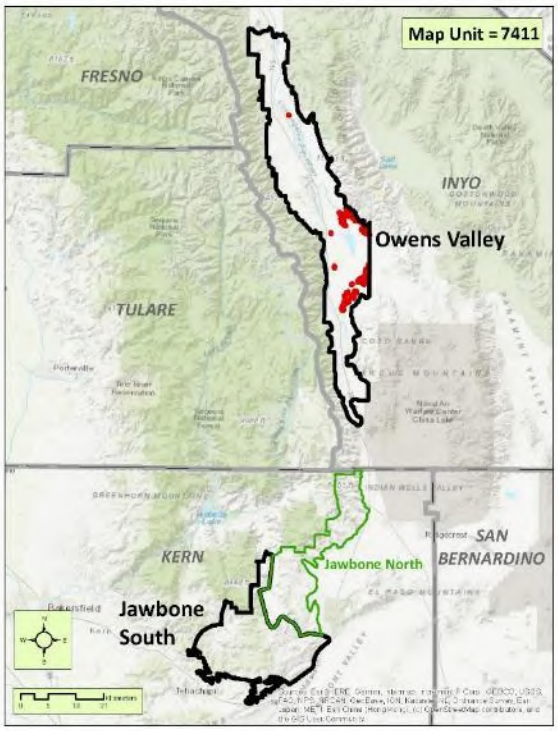
***Suaeda moquinii – Isocoma acradenia* Alliance (7411)**

Stands of *Isocoma acradenia* are open to sometimes moderately dense in cover, occurring as low, angular shrubs. These shrubs establish upslope of the *Suaeda moquinii* zone next to playas. Stands are mapped in local areas where there were field observations of the type.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

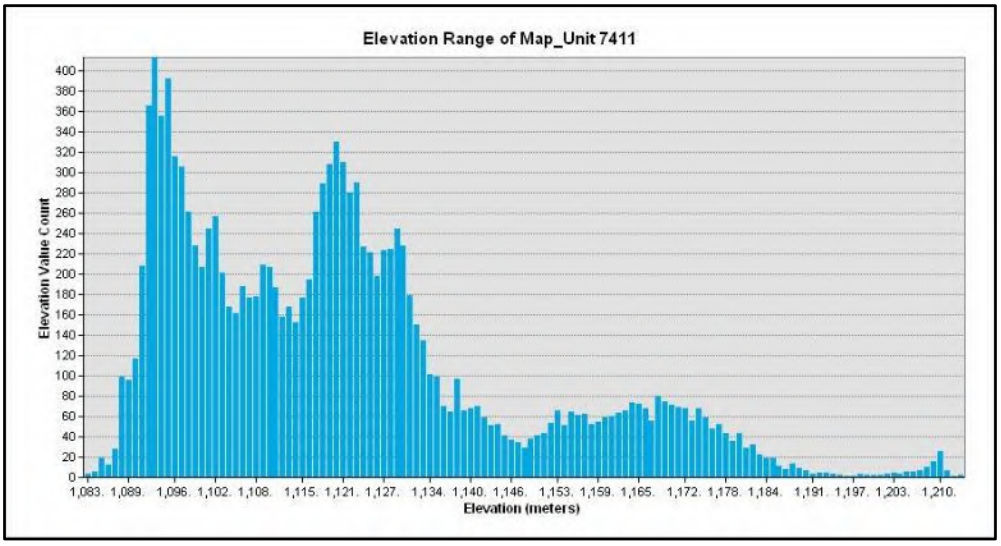
- *Allenrolfea occidentalis* Alliance (3721) – Stands are usually limited to the most saline and saturated portions of a playa compared to *Suaeda* and *Isocoma*.
- *Atriplex canescens* Alliance (5111) – *Atriplex canescens* has a wide tolerance from minimally to hyperalkaline settings. Stands co-occurring with *S. moquinii* in playa settings are extremely difficult to distinguish although more often than not, *A. canescens* will occur on small sandy hummocks that continue on downslope to the margins of the playa.
- *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 lentiformis* Alliance (3722) – Shrubs may have a tawny, puffier crown and are very limited in their relative cover and distribution.
- *Atriplex parryi* Alliance (3722) – *Atriplex parryi* occurs in similar conditions as *Isocoma acradenia* but is denser and has a grayer appearance.
- *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.

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



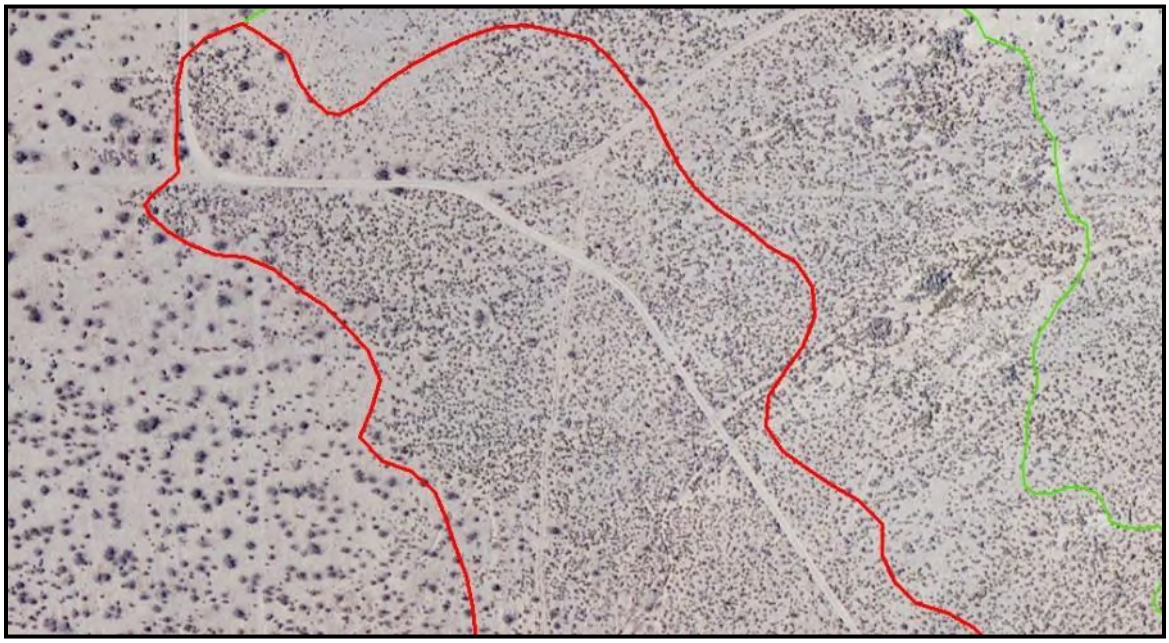

**DISTRIBUTION:** *Suaeda moquinii* occurs in an extremely broad array of edaphic and topographical settings throughout the region. Stands are associated with nearly all the major dry lakes in all regions of the DRECP. Stands also occur in areas of fluvial and anthropogenic disturbance, including the Mojave River and on old agricultural fields in the Salton Sea Trough zone. In the current study area, *Suaeda* is mapped along the Colorado River floodplain at Palo Verde Valley in the Picacho subarea; along Fish Wash/San Felipe Creek, along the South Fork Coyote Wash by Coyote Wells, several sites on West Mesa, and along the western edge of the Salton Sea Trough, all in the Salton Sea North and South subareas (mapped as *Suaeda moquinii* Mapping Unit code 3725, see following second description below). There are a few stands of *Isocoma acradenia* on dry lakes in the Central Mojave Desert, and a number of sites in the Salton Sea Trough area. In the current study area, *Isocoma acradenia* is mapped as the former *Isocoma acradenia* Alliance (3728) along the western edge of the Salton Sea Trough in the Salton Sea North and South subareas; and on East Mesa in the Flat-Tailed Horned Lizard subarea (see *Isocoma acradenia* Association following description below).

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



## *Isocoma acradenia* Association (formerly Alliance) (3728)

Alkali goldenbush Alliance



This image shows a stand of *Isocoma acradenia* between a stand of *Suaeda moquinii* (downslope to the east) and *Larrea tridentata* (upslope to the west) near a dry lakebed.

The photo shows an *Isocoma acradenia* stand with an annual grass understory and scattered *Larrea tridentata*. This stand grades into a *Suaeda moquinii* stand on the edge of a dry lakebed.

***Isocoma acradenia* Association (formerly Alliance) (3728)**

**DESCRIPTION:** Polygons mapped as this Alliance are dominated by *Isocoma acradenia* in the shrub layer. Stands occur on flat to gentle slopes near salty margins of dry lakes and playas or on episodic alkaline outwash deposits from springs and seeps. Stands may not always be mappable due to their small size and intermixing with *Atriplex confertifolia*, *A. parryi*, and *Suaeda moquinii*. Stands of *Isocoma* in the Salton Trough often form the boundary between the gently sloping alluvial fans of *Larrea tridentata* upslope and the alkaline soils of the Imperial Valley where *Atriplex spp.* and other salt tolerant plants often dominate.

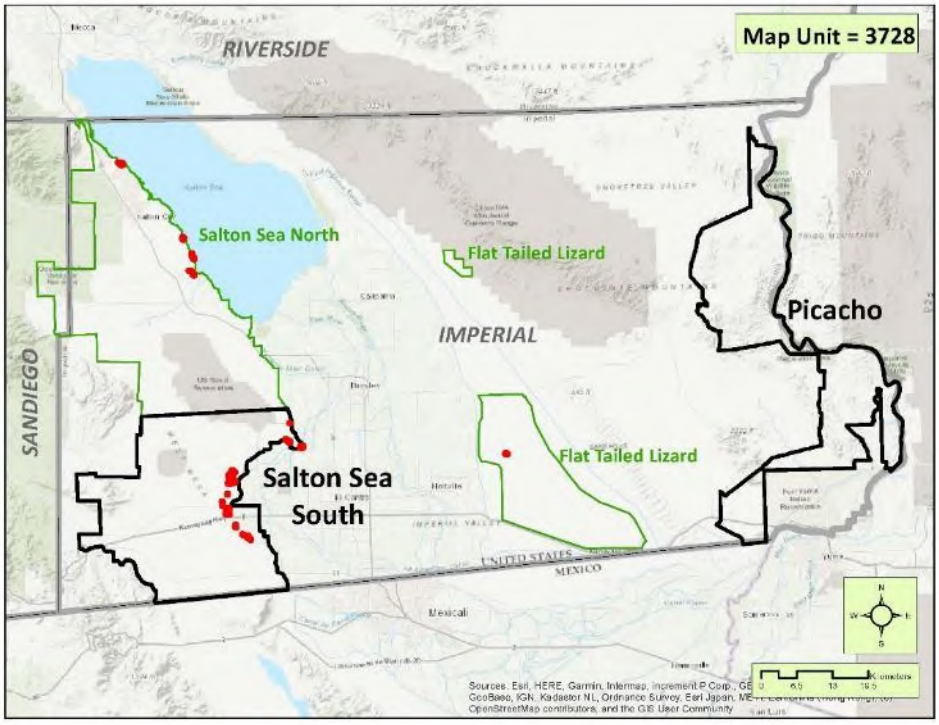
Note: As part of this project effort, additional classification data collection and analysis were performed for the Jawbone South and Owens Valley subareas. Floristic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Suaeda moquinii* Alliance (3725) and the *Isocoma acradenia* Alliance (3728) were reassigned as a Mapping Unit and Association of the new *Suaeda moquinii – Isocoma acradenia* Alliance (7411). The Salton Sea region, which includes Picacho, Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.

**PHOTOINTERPRETATION SIGNATURE:** The stands are open to sometimes moderately dense in cover, occurring as low, angular shrubs. These shrubs establish upslope of the *Suaeda moquinii* zone next to playas. Stands are mapped in local areas where there were field observations of the type.

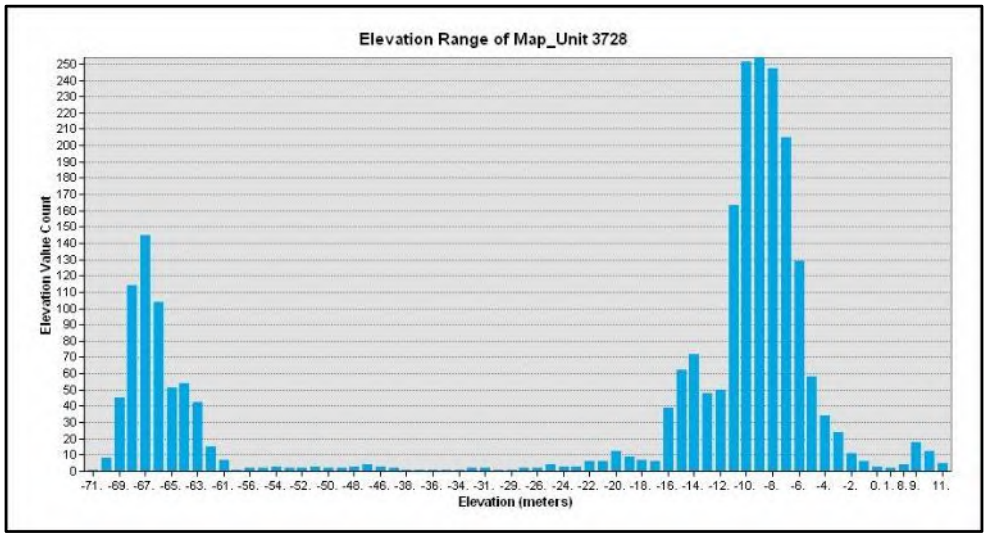
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Atriplex parryi* Alliance (3722) – *Atriplex parryi* occurs in similar conditions at China Dry Lake but is denser and has a grayer appearance.
- *Suaeda moquinii* Association (3725) of the *Suaeda moquinii – Isocoma acradenia* Alliance (7411) – *Suaeda moquinii* can sometimes mix with *Isocoma acradenia* but appear less brown.

***Isocoma acradenia* Association (formerly Alliance) (3728)**




**DISTRIBUTION:** There are a few stands on dry lakes in the Central Mojave Desert, and a number of sites in the Salton Sea Trough area. In the current study area, *Isocoma acradenia* is mapped on the western side of the Salton Sea Trough in the Salton Sea North and South subareas; and on East Mesa in the Flat-Tailed Horned Lizard subarea.



## *Suaeda moquinii* Mapping Unit (formerly Alliance) (3725)

Bush seepweed scrub Alliance

In the center of the image (in red polygon), *Suaeda moquinii* co-dominates the stand with *Allenrolfea occidentalis: S. moquinii* appears as small round shrubs that are a brownish red color, and the *A. occidentalis* occurs on small, dense hummocks. Note: This screenshot is a portion of a larger polygon whose entire boundary is not shown.

In this example, *Suaeda moquinii* is in the foreground and *Atriplex canescens* is on the hummocks beyond the *S. moquinii*.

***Suaeda moquinii* Mapping Unit (formerly Alliance) (3725)**

**DESCRIPTION:** This Alliance is mapped where *Suaeda moquinii* dominates the shrub layer, with 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. 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. 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* Association of the *Suaeda moquinii – Isocoma acradenia* Alliance (there is no *Kochia* Alliance defined yet). If *Suaeda moquinii* and either *Atriplex confertifolia* or *A. lentiformis* ssp. *torreyi* co-dominate, the type is *S. moquinii* Association of the *Suaeda moquinii – Isocoma acradenia* Alliance. If *S. moquinii* and *Allenrolfea occidentalis* co-dominate, the Alliance is the latter.

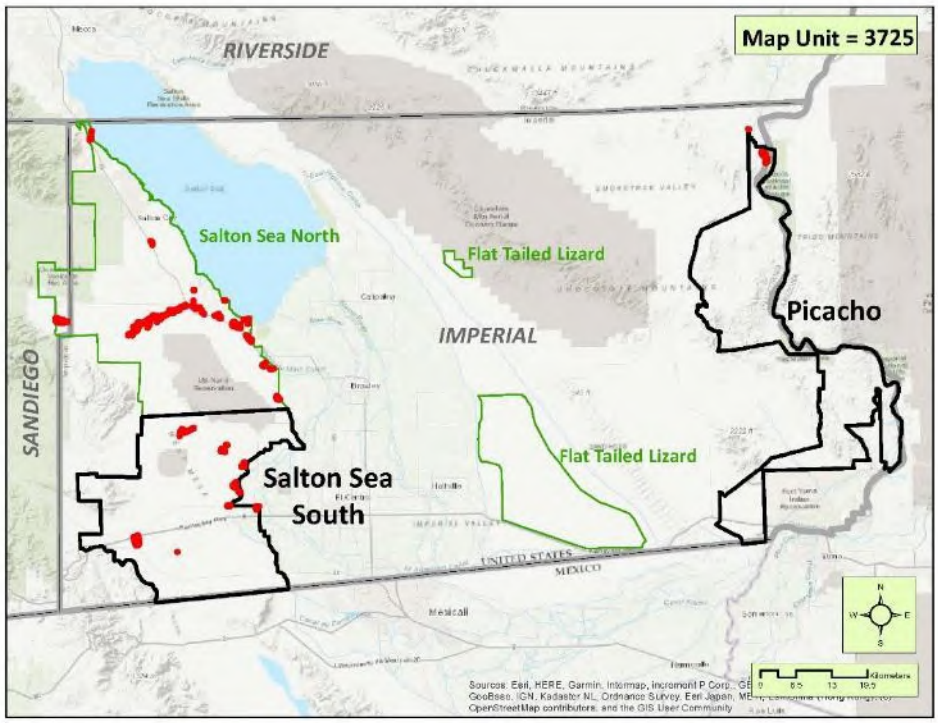
Note: As part of this project effort, additional classification data collection and analysis were performed for the Jawbone South and Owens Valley subareas. Floristic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Suaeda moquinii* Alliance (3725) and the *Isocoma acradenia* Alliance (3728) were reassigned as a Mapping Unit and Association of the new *Suaeda moquinii – Isocoma acradenia* Alliance (7411). The Salton Sea region, which includes Picacho, Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.

**PHOTOINTERPRETATION SIGNATURE:** Stands 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. Stands along the Colorado River are very dense and appear as a coarse brown mat of shrubs. 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.

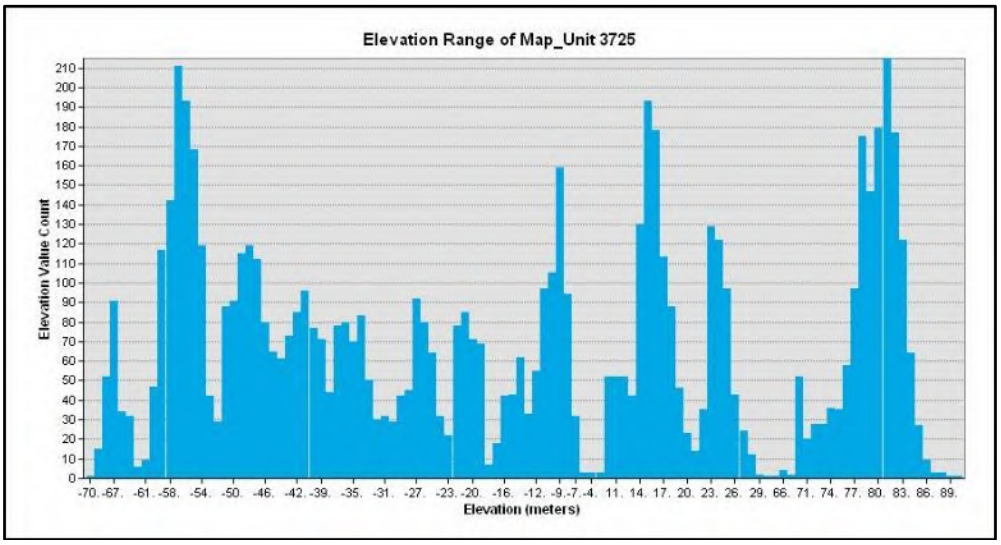
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Allenrolfea occidentalis* Alliance (3721) – Stands are usually limited to the most saline and saturated portions of a playa.
- *Atriplex canescens* Alliance (5111) – *Atriplex canescens* has a wide tolerance from minimally to hyperalkaline settings. Stands co-occurring with *S. moquinii* in playa settings are extremely difficult to distinguish although more often than not, *A. canescens* will occur on small sandy hummocks that continue on downslope to the margins of the playa.
- *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 lentiformis* Alliance (3722) – Shrubs may have a tawny, puffier crown and are very limited in their relative cover and distribution.
- *Atriplex polycarpa* Alliance (4113) – Shrubs establish in drainages and along edges of larger washes. They tolerate disturbance better. *A. polycarpa* occurs in clumpier, more

***Suaeda moquinii* Mapping Unit (formerly Alliance) (3725)**

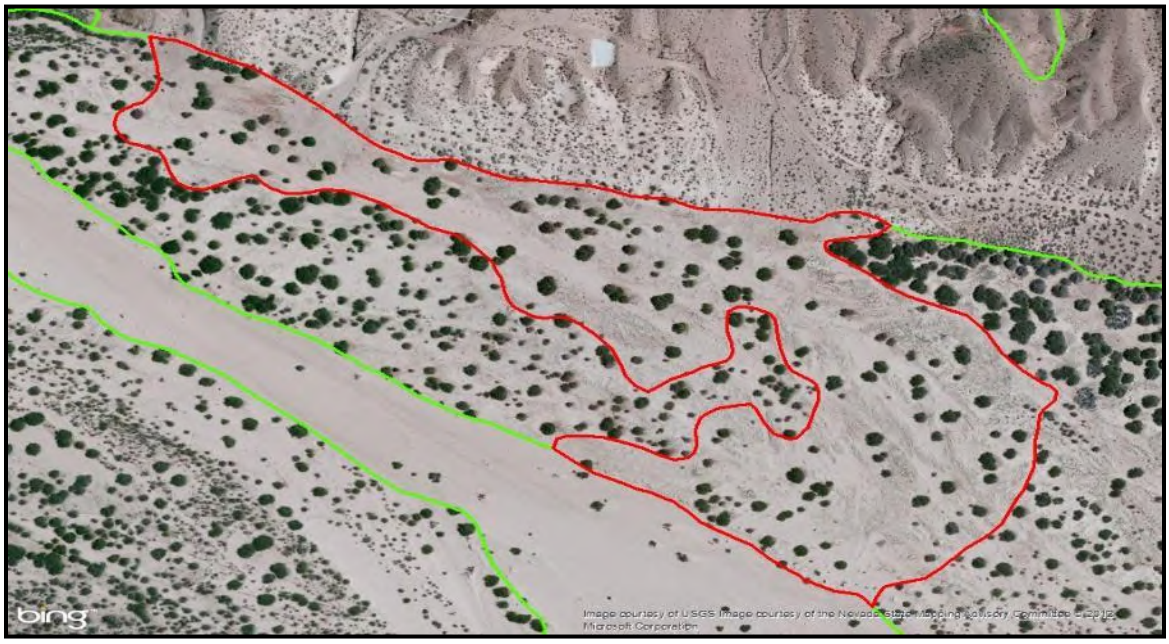



**DISTRIBUTION:** *Suaeda moquinii* occurs in an extremely broad array of edaphic and topographical settings throughout the region. Stands are associated with nearly all the major dry lakes in all regions of the DRECP. Stands also occur in areas of fluvial and anthropogenic disturbance, including the Mojave River and on old agricultural fields in the Salton Sea Trough zone. In the current study area, *Suaeda* is mapped along the Colorado River floodplain at Palo Verde Valley in the Picacho subarea; along Fish Wash/San Felipe Creek, along the South Fork Coyote Wash by Coyote Wells, several sites on West Mesa, and along the western edge of the Salton Sea Trough, all in the Salton Sea North and South subareas.



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

Tamarisk thickets Semi-natural Stands




This area shows a sparse cover of *Tamarix* occurring directly adjacent to the river channel along with two other, more densely vegetated *Tamarix* stands.

In this photo *Tamarix* spp. is seen in late-season flower colonizing in clonal groups along the hummocky banks of the Mojave River.

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

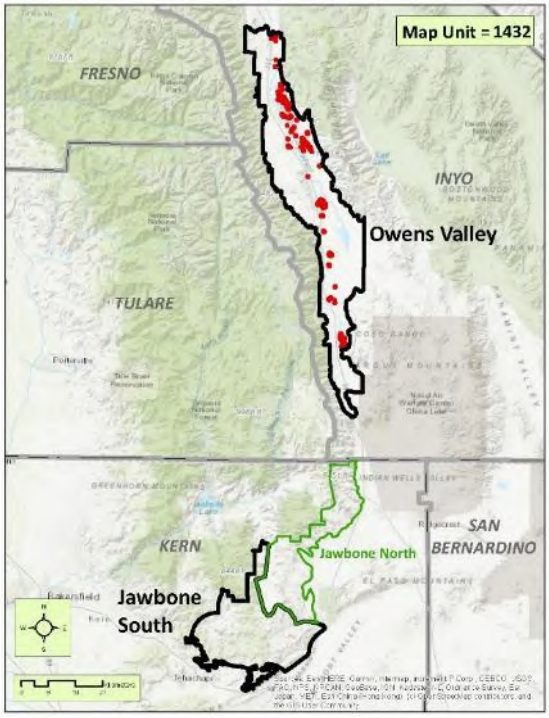
**DESCRIPTION:** In these semi-natural stands the vegetation is strongly dominated by tall shrubby invasive *Tamarix* spp., such as *T. ramosissima, T. chinensis*, or other similar species. *Tamarix* spp. constitutes more than 60 percent of the relative cover. These stands do not include the less invasive, 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.

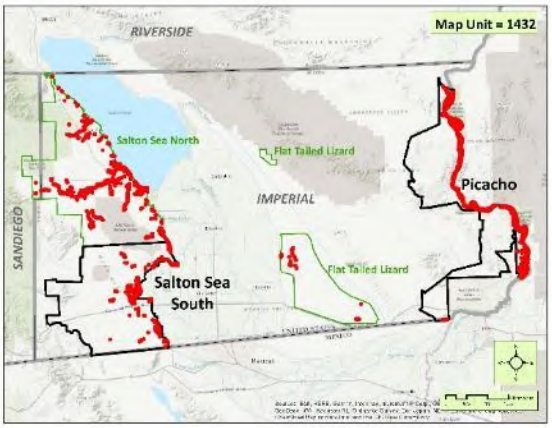
**PHOTOINTERPRETATION SIGNATURE:** Stands occur in very open to very dense cover and are typically found along man-made canals, in riparian washes and in disturbance areas. Structural characteristics vary considerably, from stands containing sparse short shrubs along sandy river flats to dense tall thickets 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:**

- *Pluchea sericea* Alliance (4221) – Stands dominated by a dense cover of *Pluchea* thickets often contain young sapling *Tamarix* in the stand in varying cover. Texture and crown characteristics in these settings between the two species are similar. Color ranges overlap, with *P. sericea* tending to be more of a blue-green, while *Tamarix* has a mixture of colors including portions of the stand which may be a rusty brown.
- *Prosopis glandulosa – Prosopis velutina – Prosopis pubescens* Alliance (4222) – Stands on the Mojave and Colorado Rivers are more likely to occur along the base of the bluff. *Prosopis* is more likely to occur as a component to a stand co-dominated by *Tamarix* along old river meanders in the Colorado River floodplain; off the meanders, *Tamarix* strongly dominates the canopy over extensive areas. The more consistently rounded crowns of *Prosopis* can be easily identified even in dense 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.

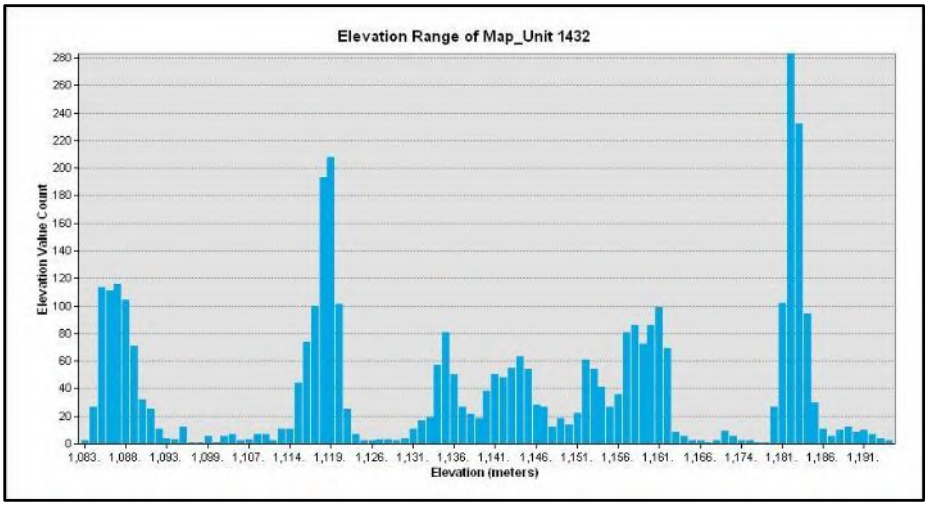
***Tamarix* spp. Semi-natural Stands (1432)**



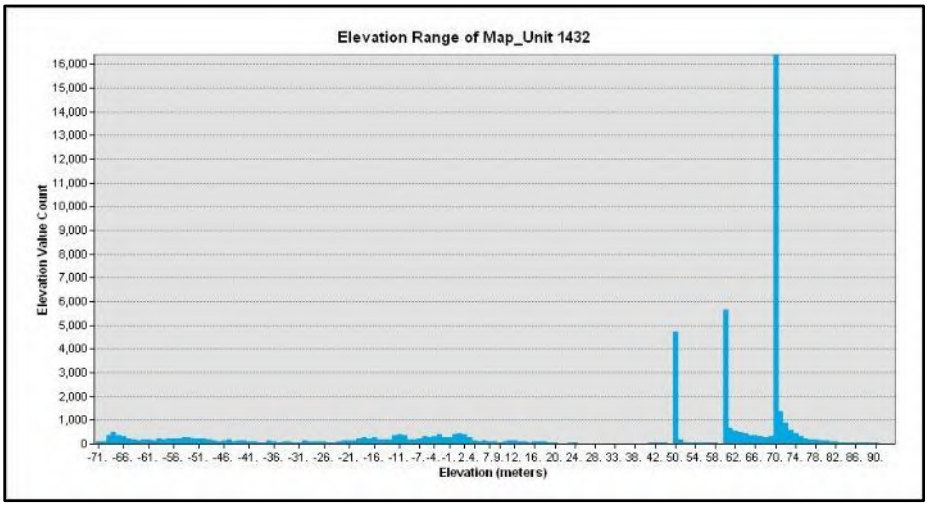




**DISTRIBUTION:** *Tamarix* is prevalent throughout the DRECP along rivers and creeks, and adjacent to dry lake beds near agriculture. In both situations, stands of *Tamarix* spp. are closely related to human disturbance and occur within close proximity to groundwater. Some of the largest, most extensive 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, extensive stands are mapped along the Colorado River floodplain in the Picacho subarea, and along many drainages throughout the hills, fans, and terraces adjacent to the western side of the Salton Trough in the Salton Sea North and South subareas, as well as in the dunes area on the eastern side of the Salton Trough in the Flat-Tailed Horned Lizard subarea. In addition, many isolated stands are mapped along the lower fans that border the Owen River floodplain in the Owen Valley subarea.

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




North subareas




South subareas

## *Vitus arizonica – Vitus girdiana* Alliance (1428)

Wild grape shrubland Alliance

*Vitis girdiana* occurs in thick patches along the terrace of a perennial stream containing *Salix lasiolepis* and *Salix laevigata*.

*Vitis girdiana* densely covers the foreground of the photo along the margins of a riparian drainage.

***Vitus arizonica – Vitus girdiana* Alliance (1428)**

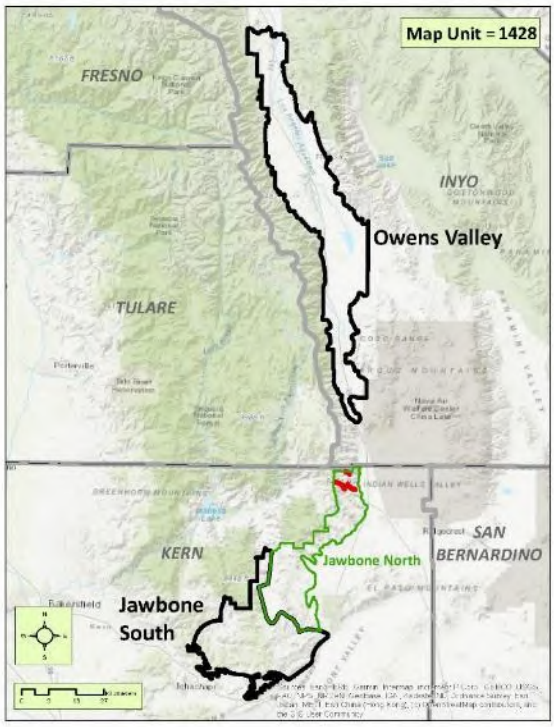
**DESCRIPTION:** *Vitis girdiana* is strongly dominant in the overstory. Stands are generally less than 1 meter tall and form a dense canopy usually under 2 acres in size although one stand was mapped at greater than 7 acres. Shrub cover is high, generally above 60%.

**PHOTOINTERPRETATION SIGNATURE:** Photo signature is remarkably uniform within the stand broken only by areas that may have small unvegetated patches of gravel or cobbly substrate. Stand color differs slightly in tone ranging from a medium to dark green depending on the age of the leaf. Texture at medium scale viewing appears consistently smooth, gaining in stipple like patterns when viewed closer up at a fine scale. Stands of *Vitis* often appear adjacent to other riparian vegetation such as *Populus* spp. yielding a distinct height contrast between the two strata.

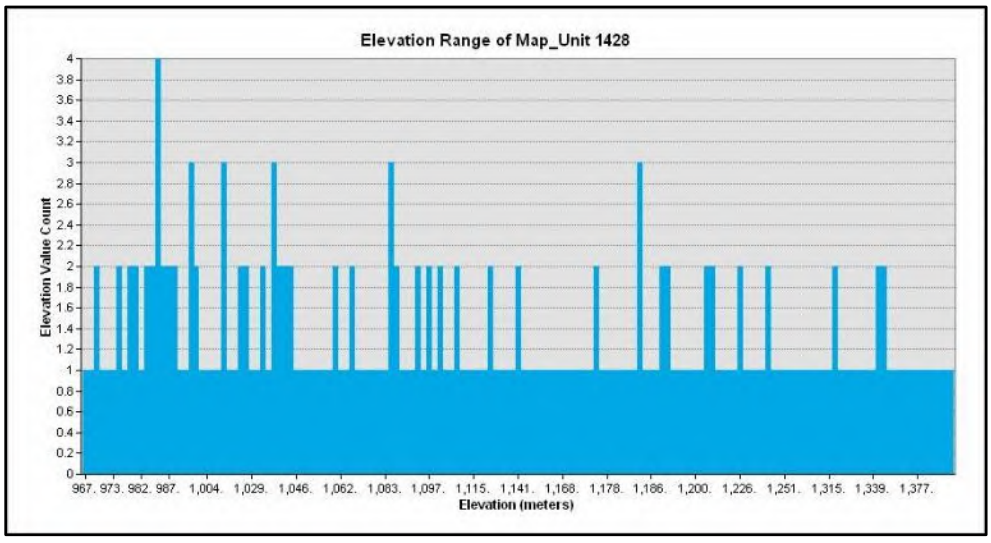
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Baccharis salicifolia* Alliance (1422) – Signature characteristics within stands of *Baccharis salicifolia* are more variable in color characteristics and texture. On average, *Vitis* yields a smoother texture even at fine scale viewing. Color range is higher in *B. salicifolia* due to the wider range of substrate characteristics commonly found in this type.
- *Anemopsis californica* Alliance (3713) – Patches of *Anemopsis californica* yield an even smoother signature, even at fine-scale viewing. Colors are generally darker green and patterning is less linear. Substrate characteristics are generally more adapted to alkaline conditions.
- *Salix exigua* Alliance (1424) – Stands of *Salix exigua* form similar linear patterns in settings that are more defined by flooding rather than seepage. Colors range more; often toward a bluish or glaucous tone in mature leaf phenology. Textures are similar between the two plants.

***Vitus arizonica* – *Vitus girdiana* Alliance (1428)**




**DISTRIBUTION:** Stands of *Vitus girdiana* are limited in the study area. Several patches occur along narrow canyon seeps, particularly in Grapevine and Sand Canyon just east of Owens Peak in the southern Sierra Nevada of the Jawbone North subarea.

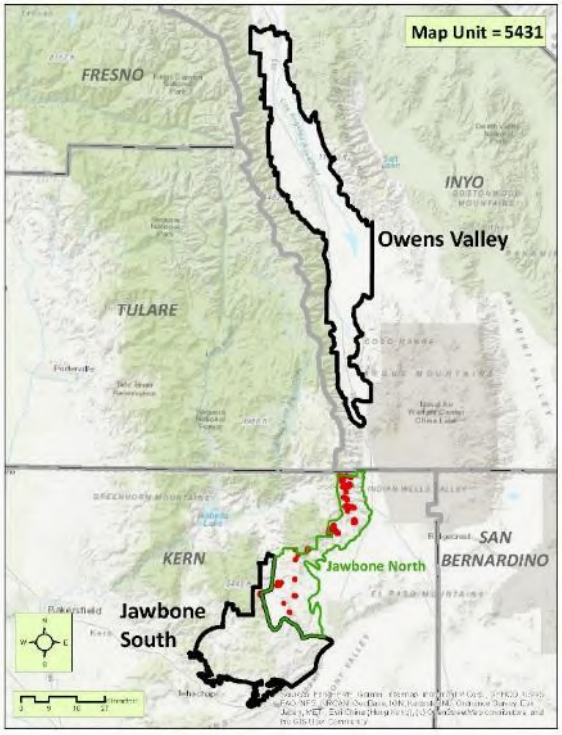


## Herbaceous

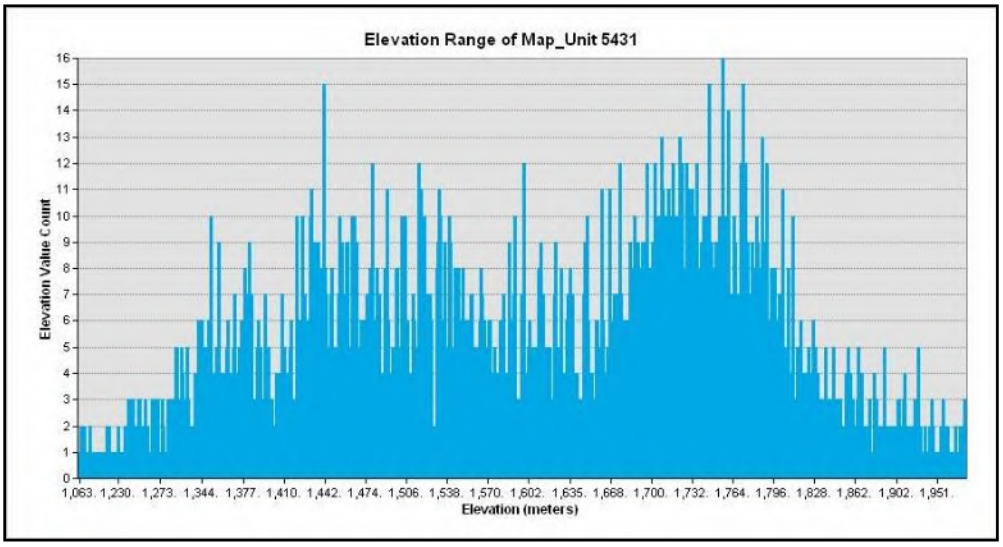
*Achnatherum speciosum* Alliance (5431)
*Anemopsis californica – Helianthus nuttallii – Solidago spectabilis* Alliance (3713)
Arid West freshwater emergent marsh Group (3410)
*Arundo donax* Semi-natural Stands – See *Phragmites australis – Arundo donax* Semi-Natural Stands
*Bolboschoenus maritimus, Schoenoplectus americanus* Mapping Unit (3715)
*Brassica tournefortii – Malcolmia africana nigra* Semi-natural Stands (2331)
California annual and perennial grassland Mapping Unit (Native component) (2305)
California annual forb/grass vegetation Group (2310)
California mixed annual/perennial freshwater vernal pool/swale/plain bottomland Group (3510)
Californian warm temperate marsh/seep Group (3610)
*Corethrogyne filaginifolia – Eriogonum (elongatum, nudum)* Alliance (2217)
*Distichlis spicata* Alliance (3726)
*Juncus arcticus* (var. *balticus, mexicanus*) Alliance (3611)
Mediterranean California naturalized annual and perennial grassland Group (2330)
*Phragmites australis – Arundo donax* Semi-natural Stands (1431)
*Phragmites australis* ssp. *americanus* Association (formerly Alliance) – See *Typha (angustifolia, domingensis, latifolia)* Alliance
*Pleuraphis rigida* Alliance (4122)
*Schoenoplectus (acutus, californicus)* Alliance (3412)
Southern Great Basin semi-desert grass Group (5430)
Southwestern North American alkali marsh/seep vegetation Group (3710)
*Sporobolus airoides – Muhlenbergia asperifolia – Spartina gracilis* Alliance (3712)
*Typha (angustifolia, domingensis, latifolia)* Alliance (3416)
*Phragmites australis* ssp. *americanus* Association (formerly Alliance) (3411) – Salton Sea South subarea
*Typha (angustifolia, domingensis, latifolia)* Association (formerly Alliance) (3415) – Salton Sea North
Vancouverian & Rocky Mountain naturalized annual grassland Group (3110)
Warm Semi-Desert/Mediterranean Alkali-Saline Wetland Macrogroup (3700)
Western North American Freshwater Marsh Macrogroup (3400)
Western North American Wet Meadow & Low Shrub Carr Macrogroup (3600)

## *Achnatherum speciosum* Alliance (5431)

Desert needlegrass grassland Alliance

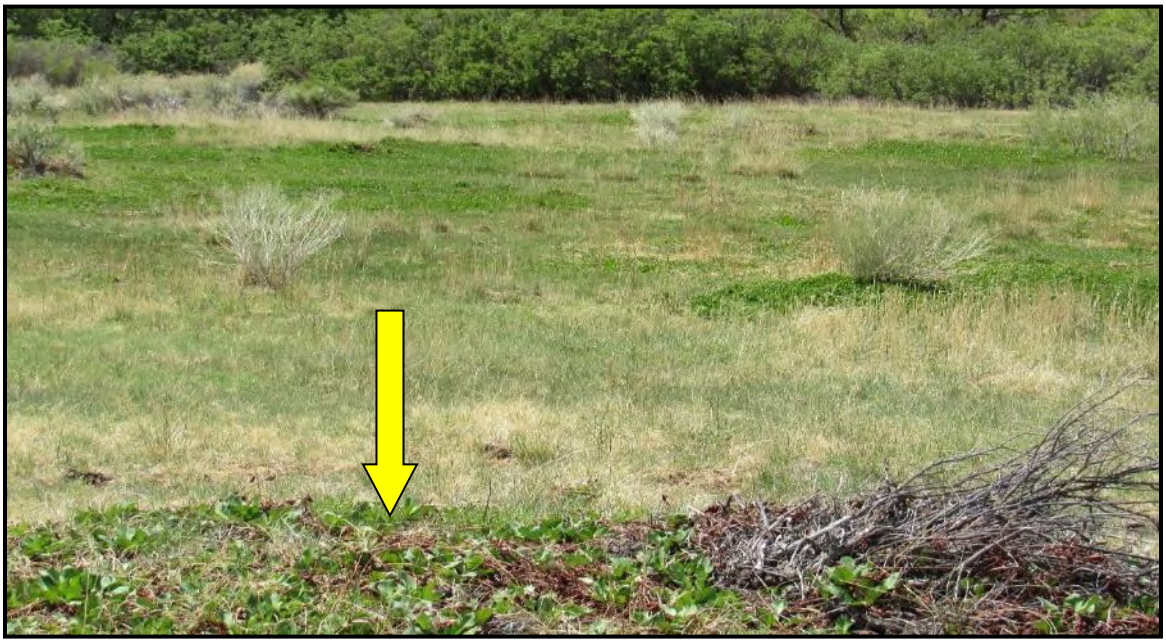



**DISTRIBUTION:** Stands of this Alliance were infrequently mapped in the study area. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project. In the current study area, *Achnatherum speciosum* was mapped throughout the desert foothills of the southern Sierra Nevada of the Jawbone North subarea. Mapping is based on field data and locally extrapolated.



## *Anemopsis californica – Helianthus nuttallii – Solidago spectabilis* Alliance (3713)

This image shows a strongly dominating stand of *Anemopsis californica* along the margin of a wetland adjacent to a polygon of emergent Salix spp. to the east.



In this photo, the arrow points to greener patches of *Anemopsis californica* occurring between duller green to tawny annual grasses.

***Anemopsis californica – Helianthus nuttallii – Solidago spectabilis* Alliance (3713)**

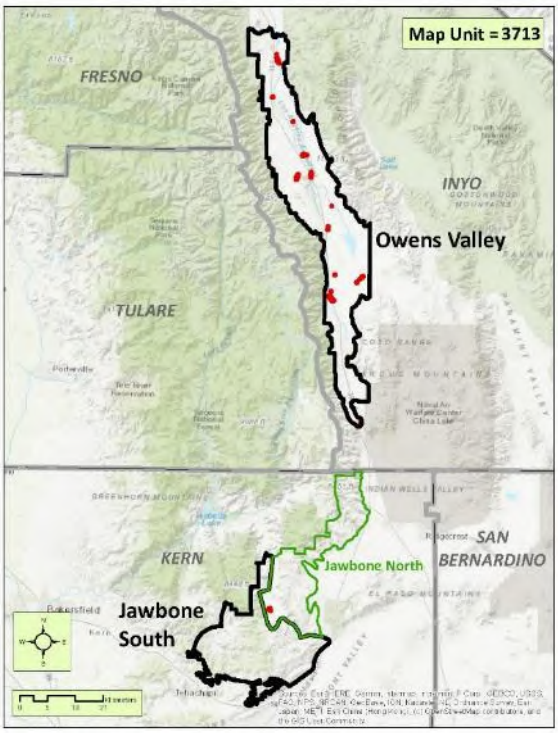
**DESCRIPTION:** *Anemopsis californica, Solidago confinis,* or *Solidago spectabilis* is dominant or co-dominant with other herbs and graminoids such as *Juncus arcticus.* Stands occur in very wet alkaline meadow settings in the Owens and, to a lesser extent, the Rose Valleys. Herbaceous cover is high, while there can be an emergent shrub component usually consisting of *Atriplex lentiformis,* or *Suaeda moquinii,* it is generally very sparse.

**PHOTOINTERPRETATION SIGNATURE:** *Anemops*is generally has a very bright green signature somewhat darker than fresh water meadow species. Texture is extremely smooth, even viewing close up with high resolution sub-meter imagery. Stands are typically small and patchy with clonal looking definitive edges.

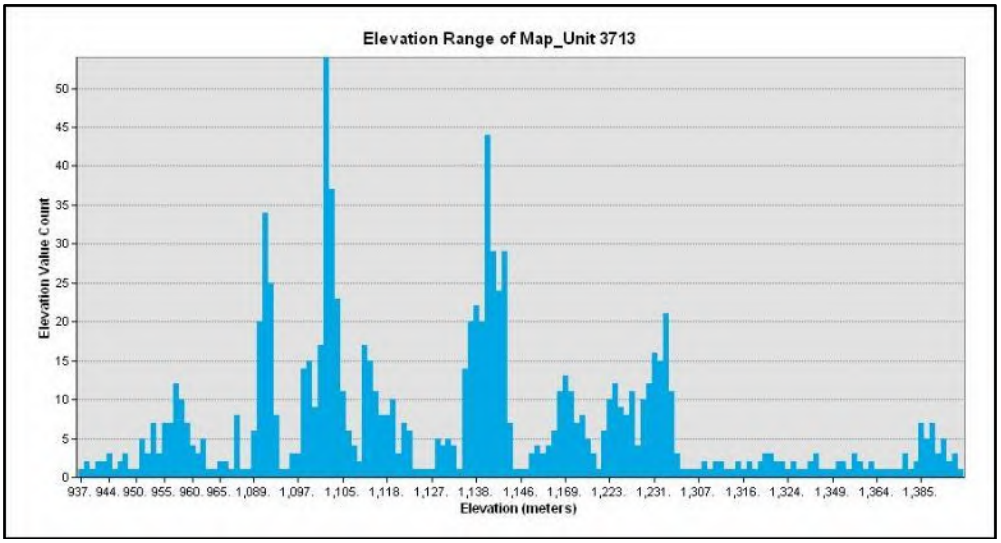
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- Agriculture Mapping Unit (9200): Young grain crops and early spring fallow fields often yield a signature similar to early development of wetlands in managed wildlife areas. Setting and ownership are crucial factors in determining whether the vegetation will be used for managed wetland purposes.
- Wetland Meadow species – Meadows dominated by *Juncus spp.* or *Carex spp.* can be extremely difficult to distinguish, and therefore context is all important as stand dominated by *Anemopsis* occur in alkaline trending substrate.

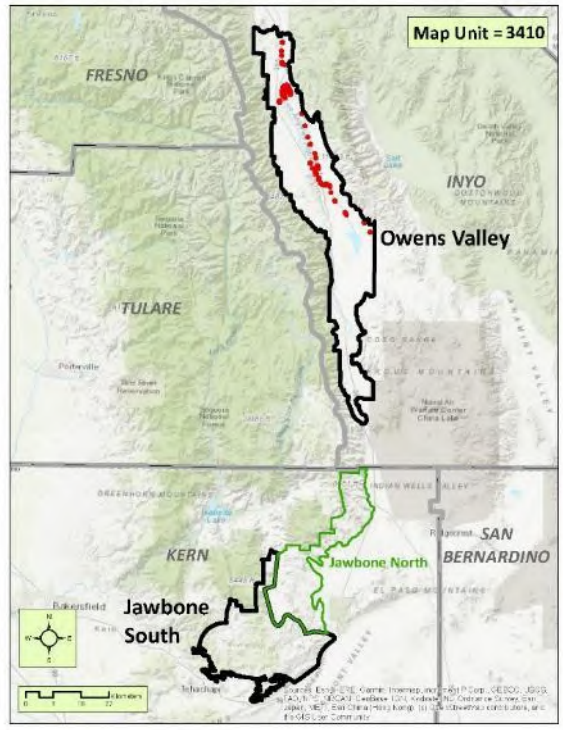
***Anemopsis californica – Helianthus nuttallii – Solidago spectabilis* Alliance (3713)**

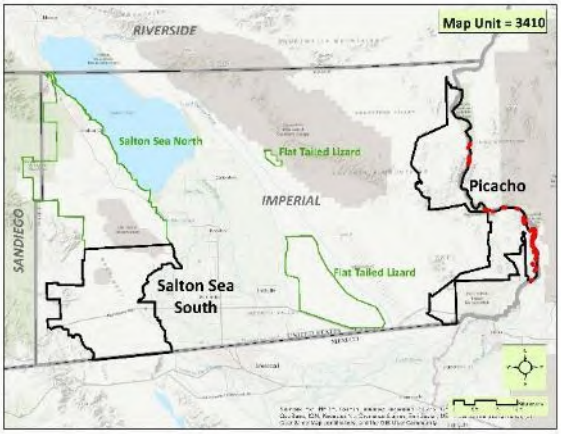



**DISTRIBUTION:** In the current study area, stands of *Anemopsis* were mapped on the Owens River floodplain, and on a few sites along Hogback Creek, Bairs Creek, the Los Angeles Aqueduct, the edge of Owens Lake, and near Olancha south of Owens Lake, all in the Owens Valley subarea. In addition, one polygon is mapped in the Kelso Valley in the Jawbone North subarea.



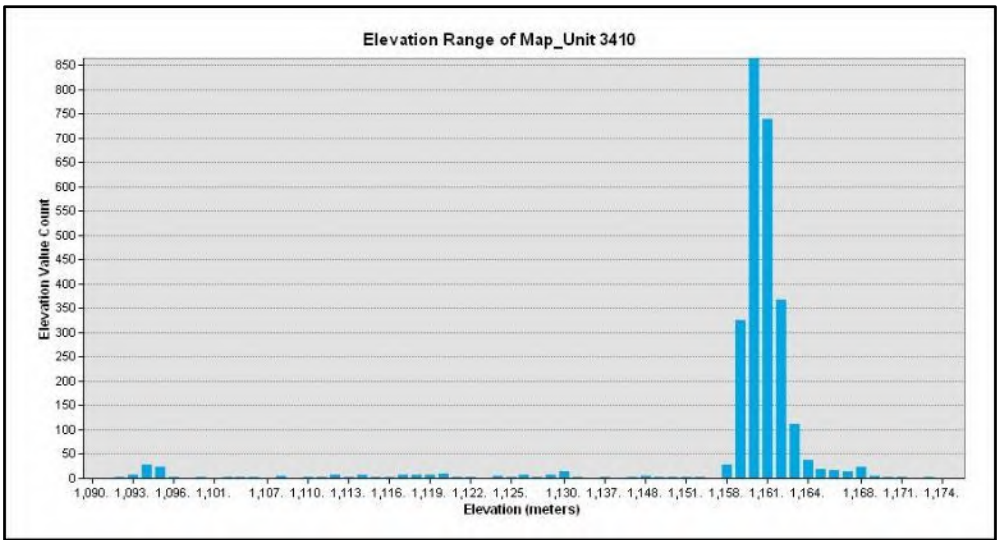
## Arid West freshwater emergent marsh Group (3410)



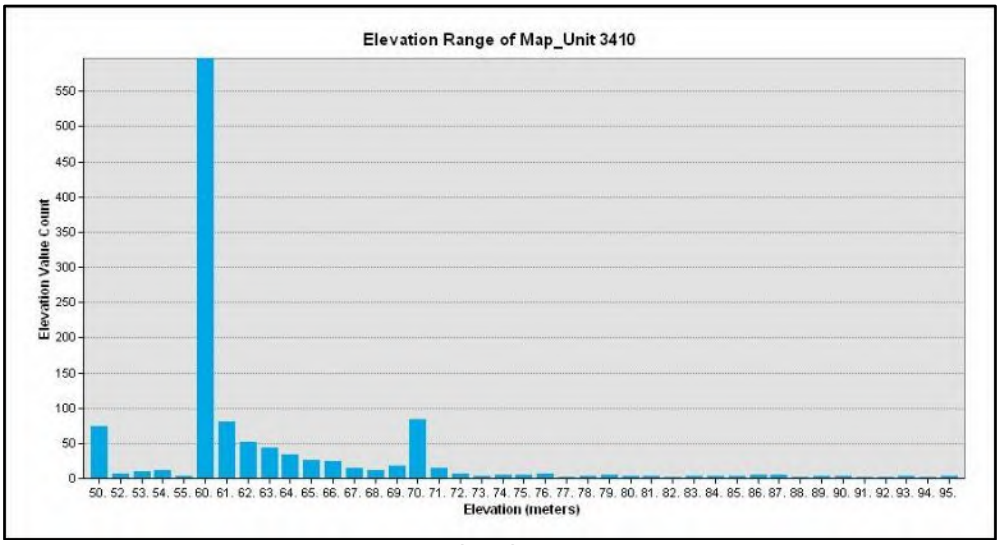




**DISTRIBUTION:** In the current study area, stands of this Group were mapped along the lower Colorado River floodplain in the Picacho subarea, and along the Owens River and floodplain in the Owens Valley subarea. These stands were mapped at the Group level because the Alliance was not discernible from the imagery. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.

**Arid West freshwater emergent marsh Group (3410)**




North subareas




South subareas

## *Bolboschoenus maritimus*, *Schoenoplectus americanus* Mapping Unit (3715)

Salt marsh bulrush, American bulrush Mapping Unit

This image displays a *Bolboschoenus maritimus* stand occupying the wettest portions of a marsh where a slow moving stream feeds into Owens Lake.

The photo shows a stand of *Bolboschoenus maritimus* occurring in a seasonally flooded marsh.

***Bolboschoenus maritimus*, *Schoenoplectus americanus* Mapping Unit (3715)**

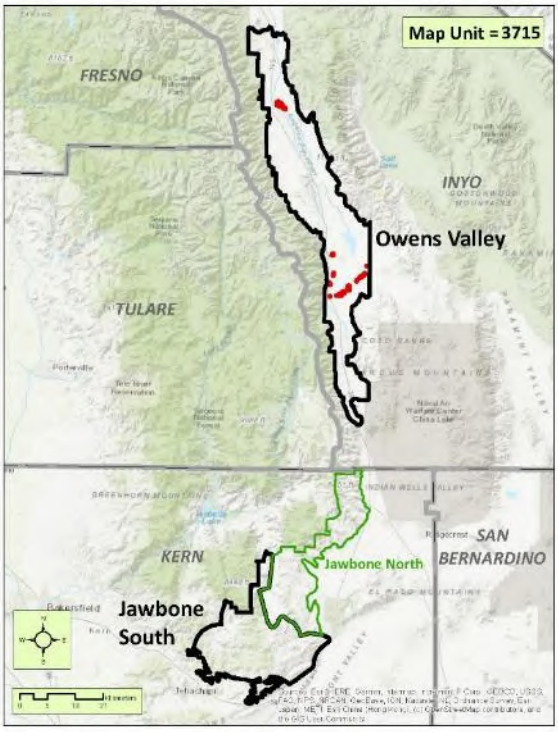
**DESCRIPTION:** Currently stands of *Schoenoplectus americanus* and *Bolboschoenus maritimus* or *B. robustus* are being treated as members of the bulrush mapping unit due to difficulty in differentiating between the two in photointerpretation. *Schoenoplectus americanus,* a vivid green triangular stemmed bulrush, forms open to dense stands in moist to flooded borders of saline or alkaline marshes in basins or near playas. Large stands also mix with *Bolboschoenus maritimus* in some seeps. Local stands of alkali bulrush (*Bolboschoenus maritimus* or *B. robustus*) also occur in a few areas of the DRECP at playas and wastewater ponds. Stands also occur in the Owens Valley, primarily in restoration sites along the edges of Owens Lake.

**PHOTOINTERPRETATION SIGNATURE:** Vegetation within this mapping unit is characterized by a signature almost identical to freshwater marsh species of bulrush such as *Schoenoplectus californicus* and/or *S. acutus.* Substrate chemistry creating scald-like patterning nearby is often a clue to alkalinity thus aiding in the separation of this mapping unit. Colors typify other bulrush in that they vary widely depending on phenology and growth cycle.

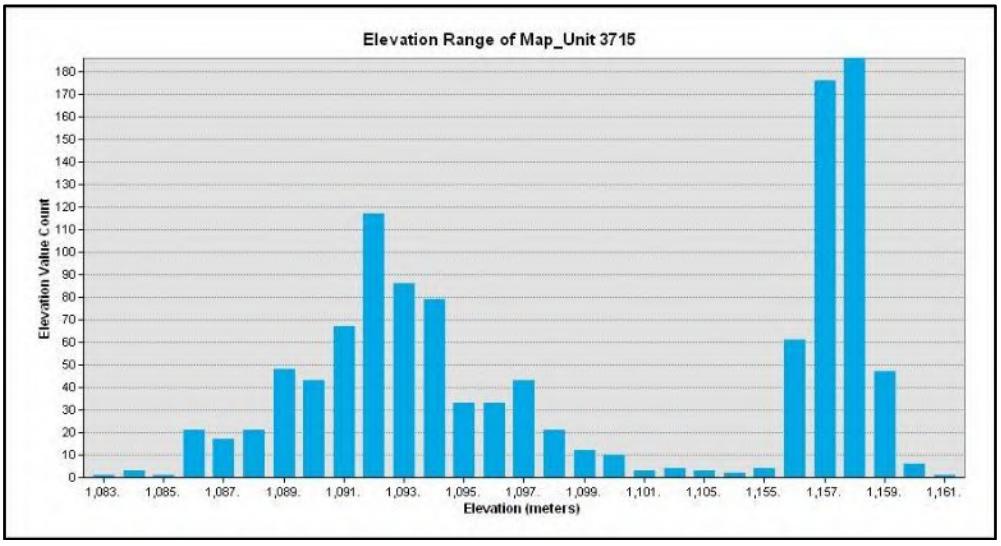
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Schoenoplectus (acutus, californicus)* Alliance (3412) – This alliance occurs in freshwater settings, and may line margins of freshwater ponds and reservoirs. *Bolboschoenus* and *S. americanus*, however, occur in brackish water, so note other adjacent brackish water sites, such as Saltgrass meadows, *Anemopsis*, and pickleweed.

***Bolboschoenus maritimus, Schoenoplectus americanus* Mapping Unit (3715)**




**DISTRIBUTION:** Stands are associated with alkaline or saline, saturated or flooded wetland settings. Most of these are adjacent to or within playas having water tables near the surface. However, environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project. In the current study area, this mapping unit is mapped on the Owens River floodplain by Thibaut Ponds. Tulare Swamp, Duck Lake, and the edge of Owens Lake in the Owens Valley subarea



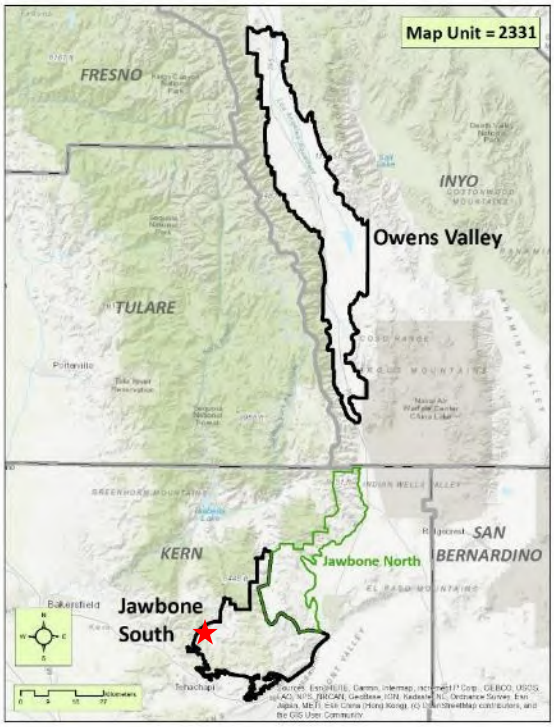
## ***Brassica tournefortii – Malcolmia africana nigra*** **Semi-natural Stands**

Upland desert mustards Semi-natural Stands (2331)

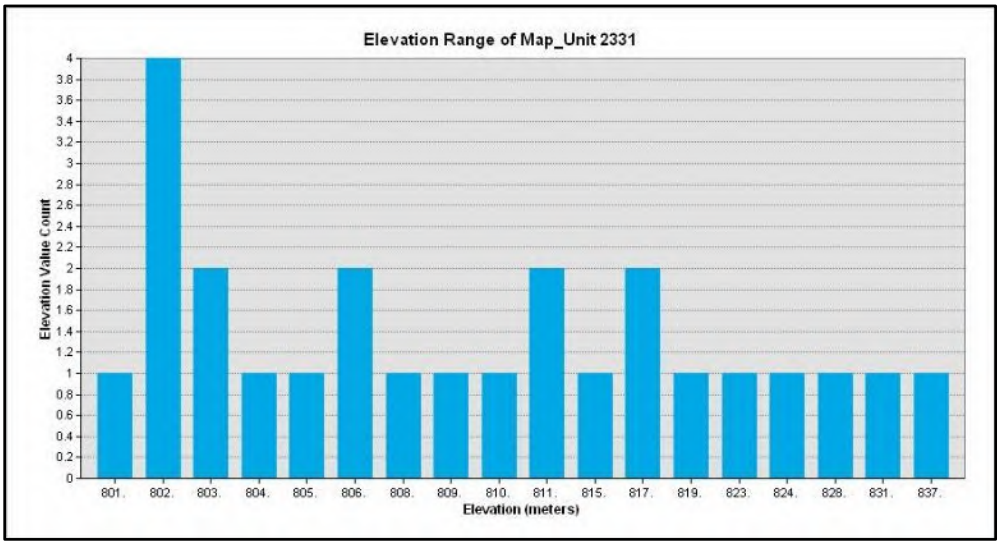
The above image depicts an annual grassland dominated by *Hirschfeldia incana* along a toe slope adjacent to a wash and *Pinus sabiniana* stand.

In the foreground of the photo, *Hirschfeldia incana* dominates the herbaceous layer with *Pinus sabiniana* in the background.

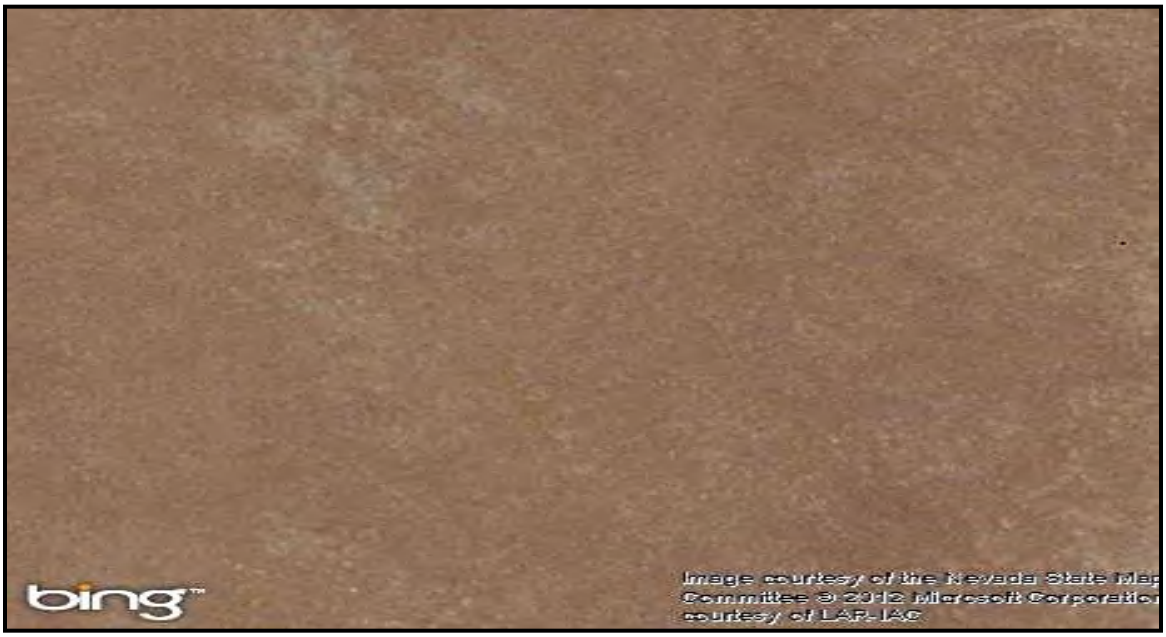
***Brassica tournefortii – Malcolmia africana nigra* Semi-natural Stands**




**DISTRIBUTION:** Although a common component to numerous stands of weedy herbaceous vegetation, this Alliance was infrequently mapped in the study area. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project. One polygon (represented as a star) was mapped from field visitation in the interior southern Sierra Nevada of Jawbone South subarea.



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




This example occurs in the western Antelope Valley where non-native annuals (mostly *Bromus rubens)* share dominance with smaller components of *Nassella pulchra, Poa secunda,* and an even smaller component of *Eschscholzia californica.* Note: This screenshot is a portion of a larger polygon whose boundaries are not shown.

In this photo, *Bromus rubens* co-dominates the stand with native grasses including *Nassella pulchra*. Note scattered *Eschscholzia californica* in a small patch toward the middle of the photo.

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

**DESCRIPTION:** These stands are presumed to contain native grass and herb species especially without wildflower color signature. 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, especially in the western Antelope Valley.

**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.

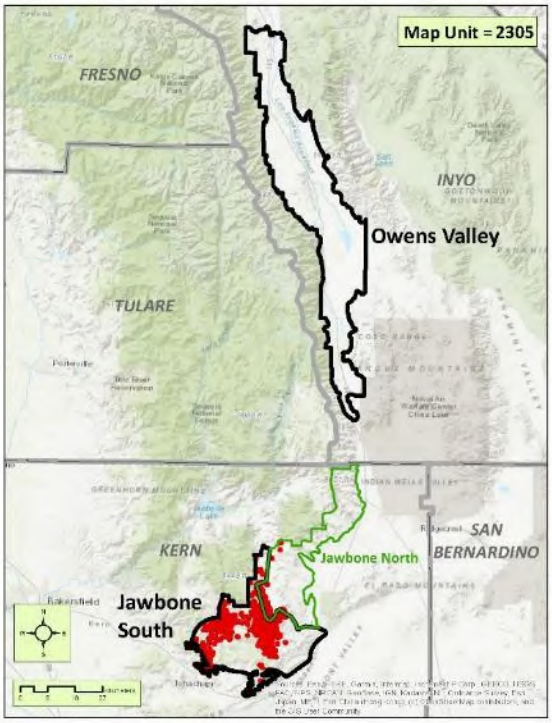
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Achnatherum speciosum* Alliance (5431) – This is an alliance level type where photo interpreters can see individual clumps of grasses on fine-scale imagery. Clumping is generally distinct and recognizable across a majority of the stand. The clumping signature is often accompanied by a small shadow, especially where cover is high.
- 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.*

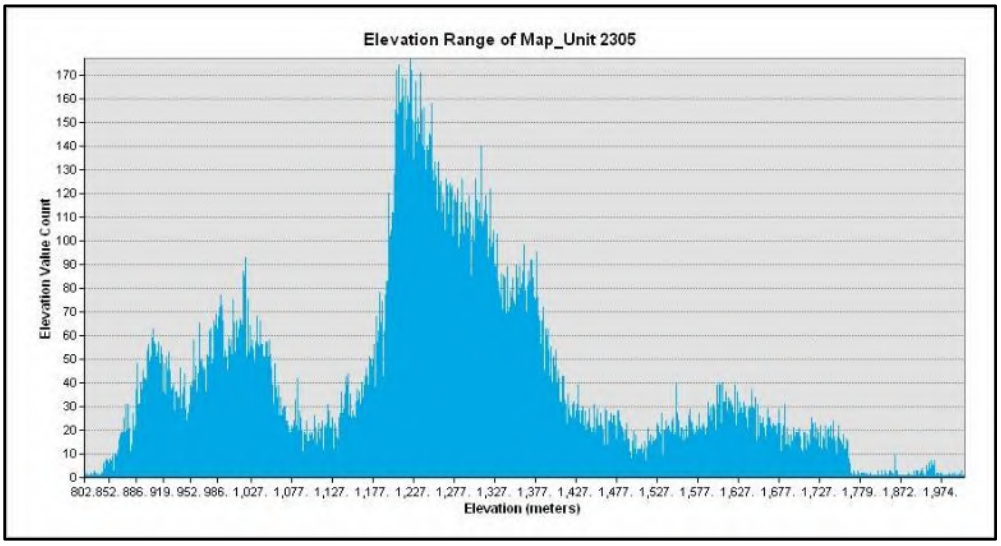
**California annual and perennial grassland Mapping Unit (Native component) (2305)**

- Sparse early seral stands of shrub cover (may include types from 2214, 2221, 4111, 4113, 4115, 5211, 5212, 5419, 7520,) – 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 of 2010 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 most of the region west of the Mojave River, becoming very common in the western portion of the Antelope Valley and the southern Sierra Nevada. In the current study area, this type is mapped in the interior and desert foothills of the southern Sierra Nevada of Jawbone North and South subareas.



## California annual forb/grass vegetation Group (2310)


The above image depicts *Monolopia, Layia platyglossa,* and/or *Lasthenia* after a higher than average late season rain in the western Antelope Valley.

*Lasthenia californica* is depicted here under a stand of *Larrea*. In general, stands containing yellow flowers cannot be distinguished or environmentally modeled and must be designated to a Group level.

**California annual forb/grass vegetation Group (2310)**

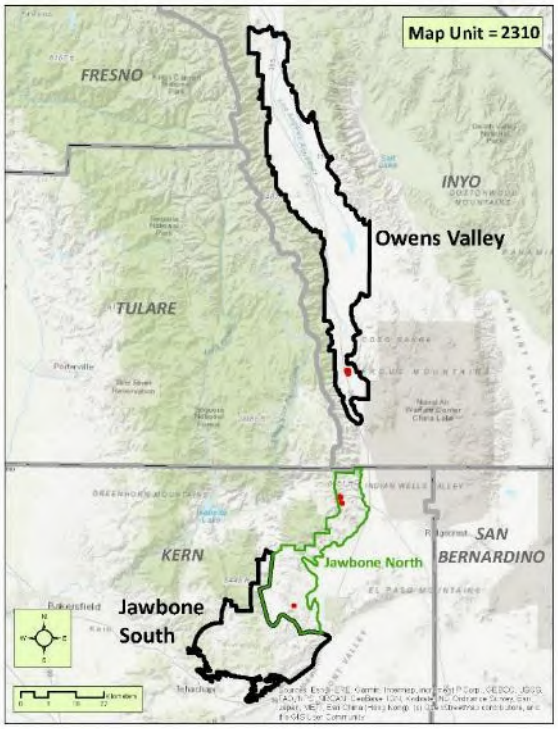
**DESCRIPTION:** Stands of this Group are dominated or characterized by mostly annual grasses and forbs. Native herbs are characteristic and evenly distributed across the herbaceous layer, though non-native forbs and grasses may be dominant. Cover and composition vary year to year, but indicators are usually present in sufficient amounts to differentiate these stands from non-native stands. Diagnostic species include *Amsinckia* spp., *Eschscholzia* spp., *Lasthenia* spp., *Monolopia* spp., *Layia* spp., *Coreopsis* spp., *Plantago erecta* and *Vulpia microstachys*.

**PHOTOINTERPRETATION SIGNATURE:** Stands designated with this vegetation Group have a showy color display on at least one set of imagery. In most cases, these flower displays are seen on late spring – early summer imagery. When the color(s) is/are consistent over an area larger than 10 acres, the stand should be mapped to this type. Texture is smooth as in most herbaceous types but patterning is mottled, often with a patchwork of colors intermixing with the typical signatures of the annual Mediterranean grasses. No one color dominates the stand except yellow.

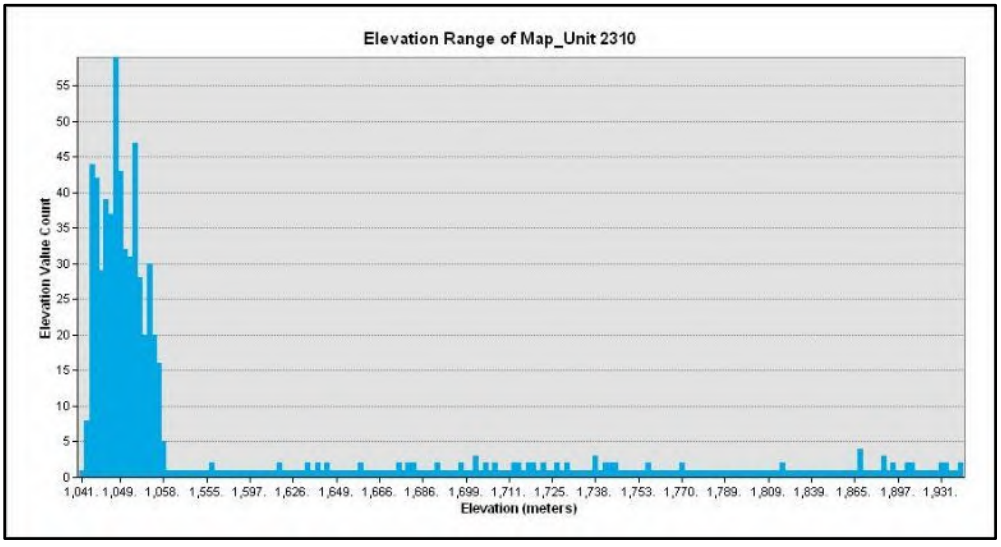
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- California annual and perennial grassland Mapping Unit (Native component) (2305) – Stands designated with this mapping unit lack the consistent showy color reflected in the native flower fields. Although both types are represented throughout the study area west of the Mojave River, this mapping unit is significantly more common and widespread. Stands mapped to this type are less likely to occur in alkaline settings where *Lasthenia* will often bloom adjacent to scalds with *Atriplex spinifera.*
- Mediterranean California naturalized annual and perennial grassland Group (Weedy) (2330) – These are weedy areas that contain little or no native forbs. Difficulty separating out these two categories occurs in disturbance sites which are returning as weedy fields but with a significant component of *Amsinckia* spp. In these situations, *Amsinckia* that is consistent in the herbaceous layer cannot be detected on the photo, and mapped stands may be incorrectly designated with this type.

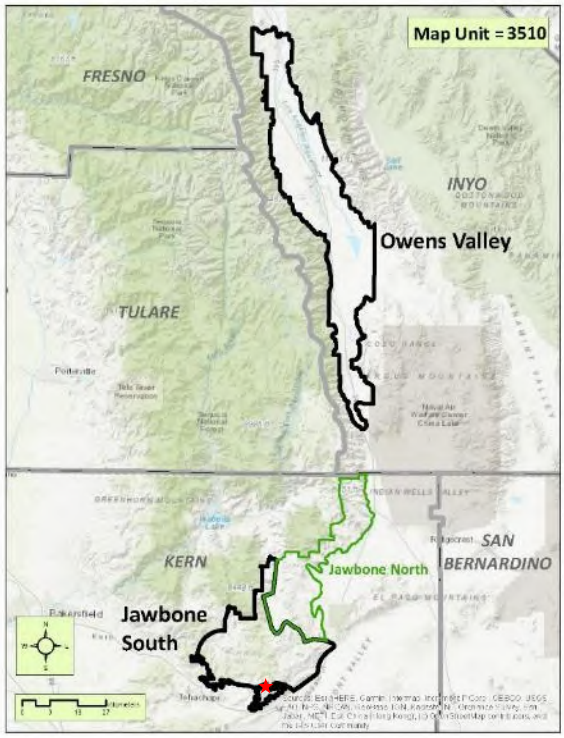
**California annual forb/grass vegetation Group (2310)**




**DISTRIBUTION:** The Group level is assigned to the vegetation type only when the photo signature and ecological characteristics make photointerpretation and modeling/extrapolation inconclusive for a specific Alliance call. Stands are scattered in locations throughout the western Mojave Desert and are more common in the western Antelope Valley. Three polygons were mapped in the desert foothills of the southern Sierra Nevada in the Jawbone North subarea, and one polygon was mapped on the valley bottom in the Owens Valley subarea



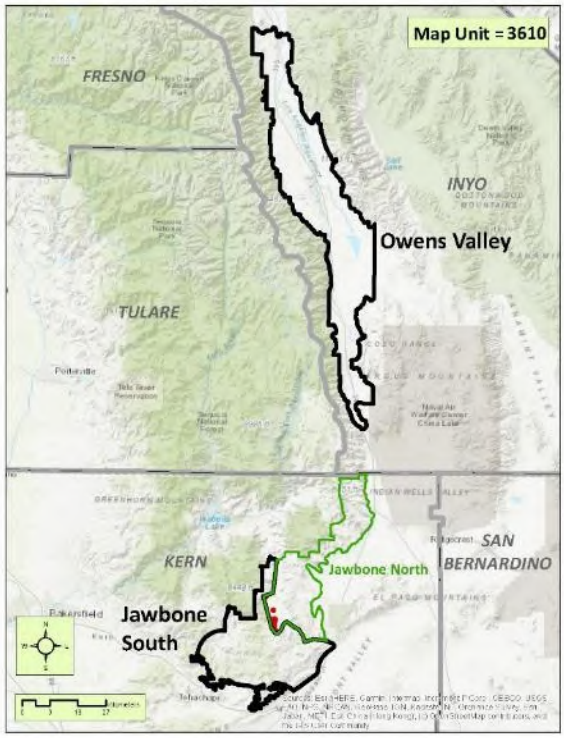
## California mixed annual/perennial freshwater vernal pool/swale/plain bottomland Group (3510)



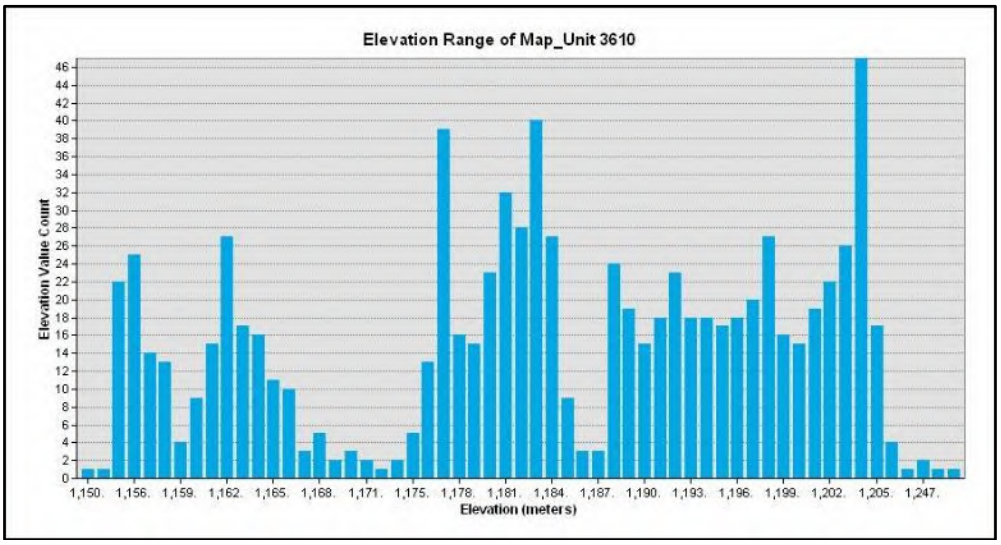

**DISTRIBUTION:** Stands are mapped at the Group level when the Alliance is not discernible from the imagery. The only stand mapped to this Group is located on the Pacific Crest Trail in the southern Sierra Nevada in the Jawbone South subarea (represented by a star). Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.

Due to small aerial extent no Elevation Range Chart is provided

## Californian warm temperate marsh/seep Group (3610)

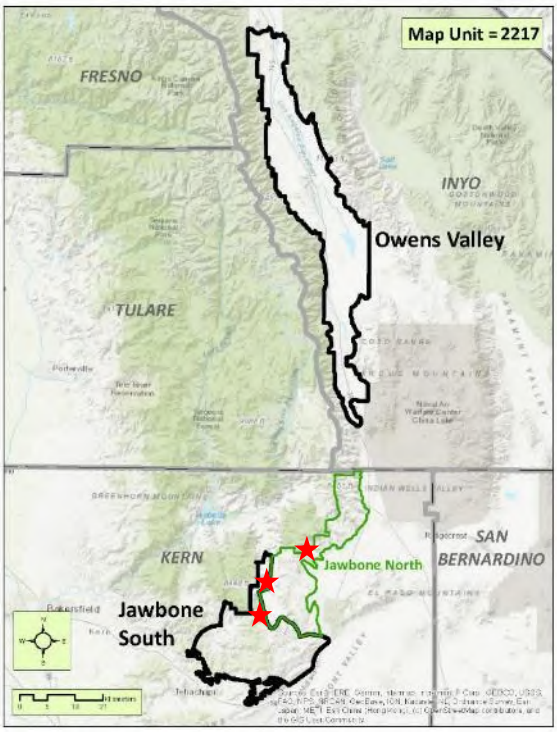



**DISTRIBUTION:** Six polygons of this Group were mapped in the Kelso Valley of the Jawbone North subarea, none of which were verified or visited in the field. These stands were mapped at the Group level because the Alliance was not discernible from the imagery. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.

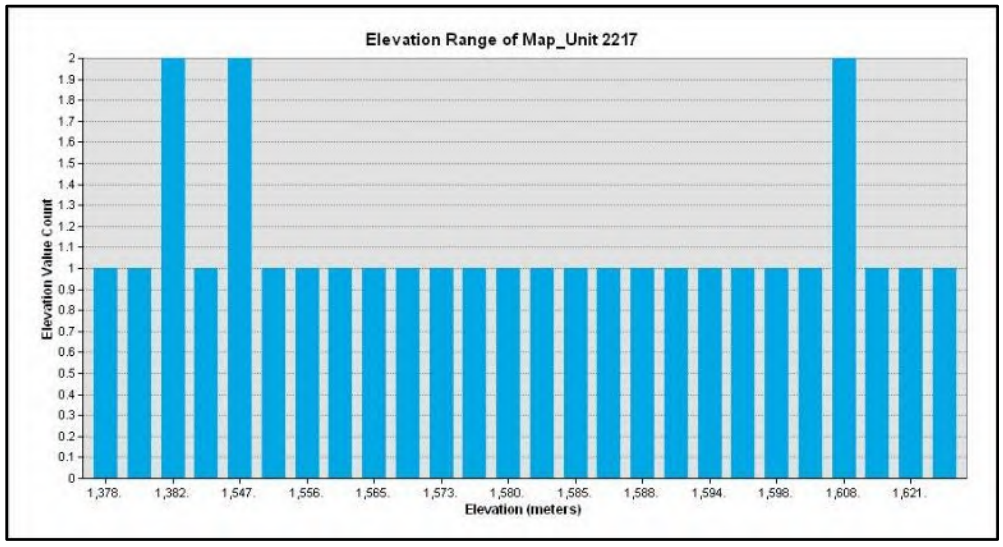


## *Corethrogyne filaginifolia – Eriogonum (elongatum, nudum)* Alliance (2217)

Sand-aster – Perennial buckwheat fields Alliance




**DISTRIBUTION:** Field assessed stands of *Lupinus excubitus,* as an Association of this Alliance were infrequently mapped (represented as a stars) in the study area. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project. *Lupinus excubitus,* were mapped in the interior southern Sierra Nevada of the Jawbone North and South subareas.



## *Distichlis spicata* Alliance (3726)

Salt grass flats Alliance


This stand of *Distichlis spicata* is mapped along the western margins of Harper Dry Lake. The area receives water from small ditches draining agricultural runoff to the south and west of the stand.

This photo depicts a band of dense *Distichlis spicata* along the margins of Harper Dry Lake in post season growth phase.

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

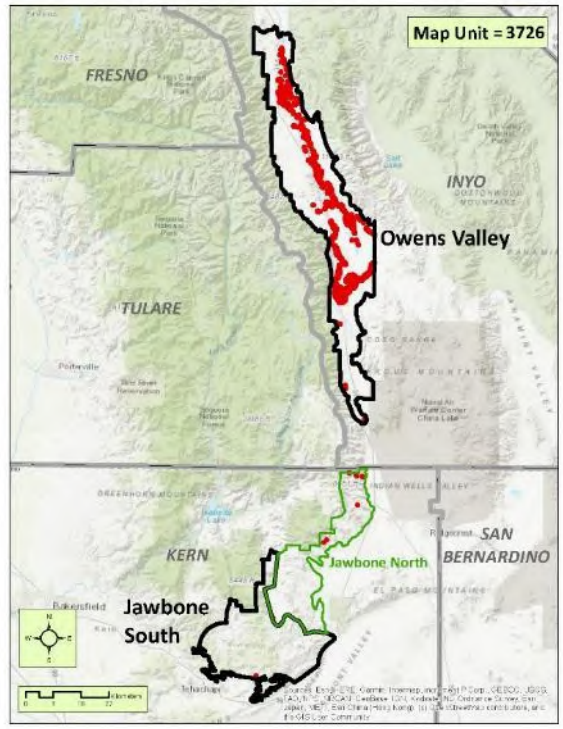
**DESCRIPTION:** *Distichlis spicata* is dominant to co-dominant with at least 2% cover in the herb layer; though, non-native herbs may be present with moderately higher cover. Soils are often deep, alkaline or saline, and poorly drained. A variety of native and non-native forbs and grasses may be present. *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. Mappable stands occur at Harper Dry Lake, Owens Valley, and several other sites in the study area. *Scirpus nevadensis* (= *Amphiscirpus nevadensis*) may be dominant, co-dominant or characteristically present with *Distichlis spicata* in inland alkaline marshes, such as in Owens Valley.

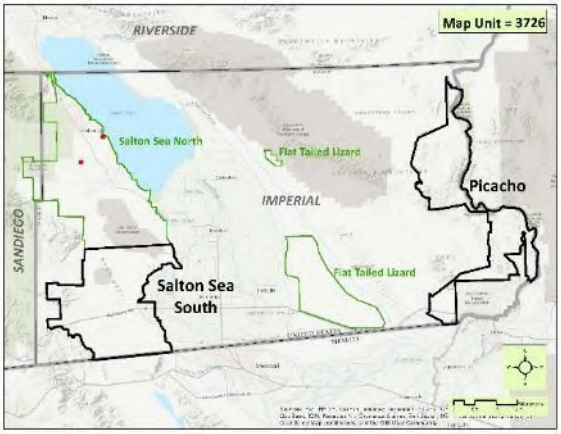
**PHOTOINTERPRETATION SIGNATURE:** Stands are mapped in several locations adjacent to salt flats along the margins of lakebeds in the western Mojave Desert. Signature color is variable, ranging from tan to light gray depending on how recently the herbaceous layer senesced. Texture is smooth but patterning is somewhat mottled. Herbaceous cover adjacent to more recent agricultural activity has some greenness to the signature color.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- Vancouverian and Rocky Mountain naturalized annual grassland Group (3110) – Stands containing *Bassia scoparia* were noted in similar settings to *D. spicata.* Signature characteristics are currently not understood in post season phases of this species.
- 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.

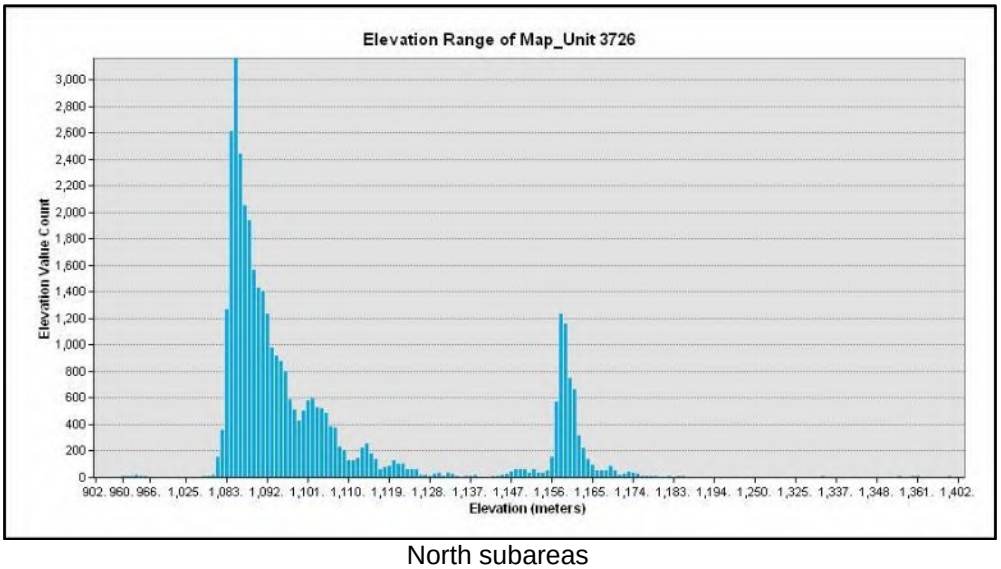
***Distichlis spicata* Alliance (3726)**



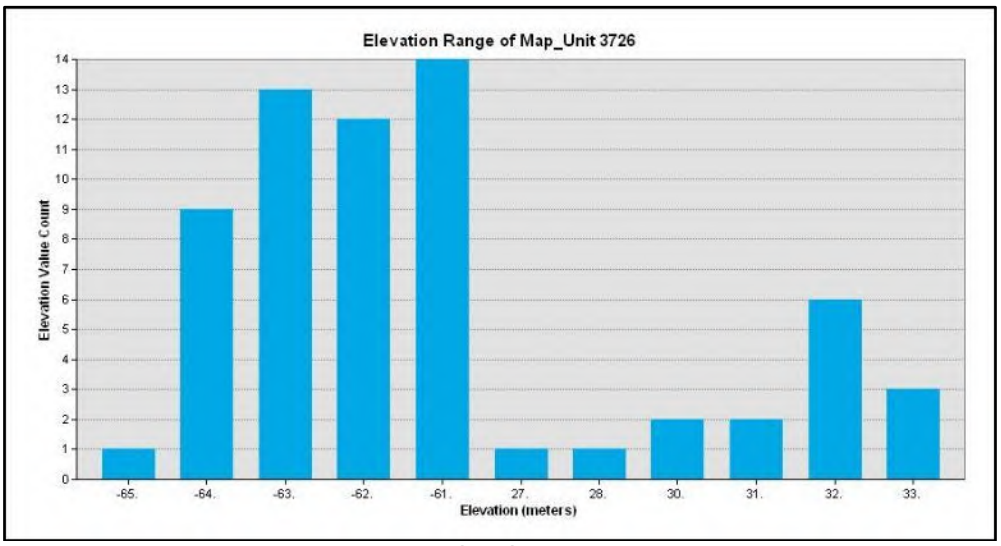




**DISTRIBUTION:** This type occurs infrequently over widely scattered locations in the western Mojave Desert, while small stands occur on isolated wet areas in the Salton Sea Trough zone. In the current study area, *Distichlis spicata* was mapped along the Owens River and its floodplain, on the lower alluvial fan to the west and in and on the margins of Owens Lake in the Owens Valley subarea; as isolated sites in several canyons on the eastern Sierra Nevada foothills in the Jawbone North subarea; as one site in Horse Canyon in the interior southern Sierra Nevada of the Jawbone South subarea; and two sites on the terraces west of the Salton Sea south of Salton City in the Salton Sea North subarea. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.

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




North subareas




South subareas

## *Juncus arcticus (*var. *balticus, mexicanus)* Alliance (3611)

Baltic and Mexican rush marshes Alliance


This stand is strongly dominated by *Juncus arcticus.*

In this example, *Juncus arcticus* dominates the herbaceous cover.

***Juncus arcticus* (var. *balticus*, *mexicanus*) Alliance (3611)**

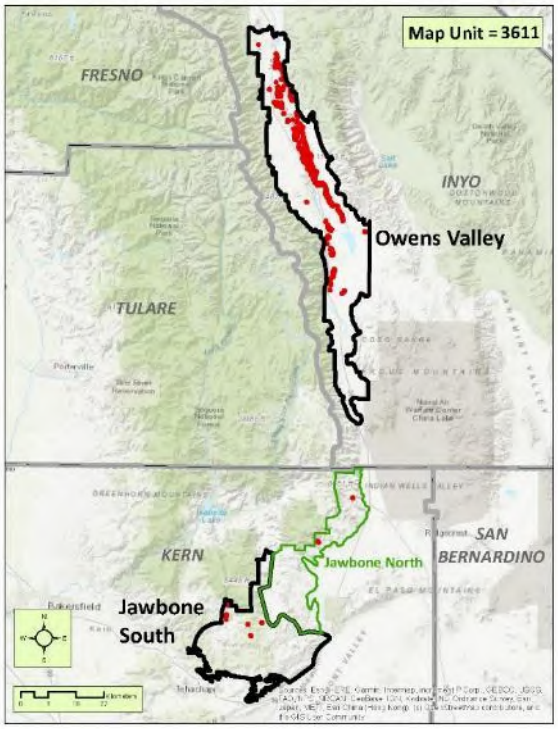
**DESCRIPTION:** In this Alliance, *Juncus arcticus*, a rhizomatous rush is the dominant and characteristic species that occurs in temporarily to seasonally flooded meadow environments. Stands may include similar to lower cover of other native and non-native herbs, but *J. arcticus* is prevalent throughout. Mappable stands occur around seeps and springs.

**PHOTOINTERPRETATION SIGNATURE:** Stands are found in low swales with little or no stream channel noted. Growing season signature color is a medium to dark green with a fairly bright hue. Late in the growing season, meadow signatures are more distinct against annual grasses; however, many of the more mesic forbs remain green and can be mistaken for *Juncus* spp. Stands along meadow edges tend to be better defined and have a slight brownish tone in mature growth phases.

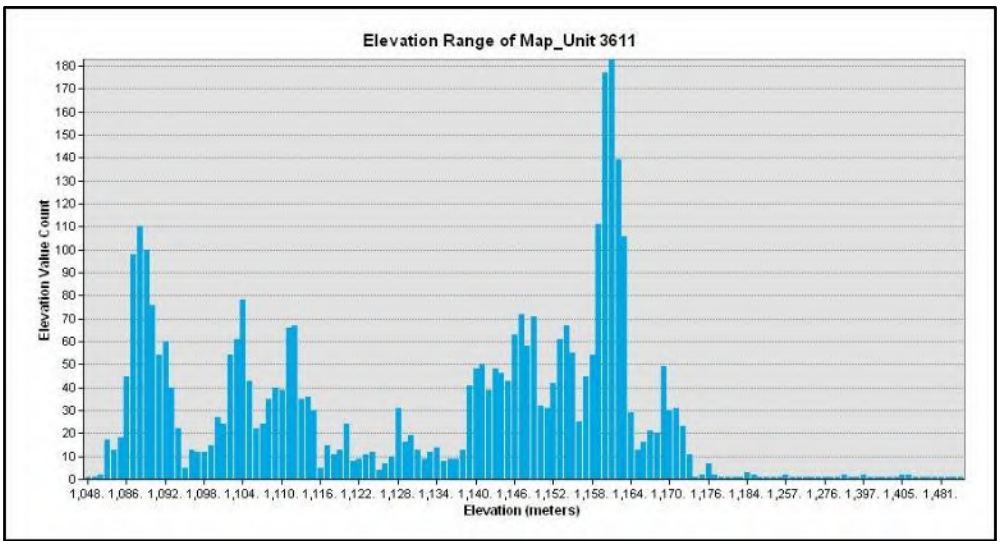
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- California annual and perennial grassland Mapping Unit (Native component) (2305) – Early growing season stands of this herbaceous type tend to yield a bright green signature very similar to *Juncus arcticus* meadows. As the annuals die out, mesic swales tend to remain green and often form shapes that emulate wetland meadows. Seasonally flooded wetland meadows usually form a more distinct color gradient than a mesic forb to drier grassland community.
- Mediterranean California naturalized annual and perennial grassland Group (2330) – Herbaceous cover within this Group tends to form smooth but very patchy patterning in the landscape. Wetland gradients are largely absent. Unlike herbaceous cover dominated by *Juncus* spp. and other wetland grasses, low mesic swales containing weedy forbs tend to have a small but clearly defined stream channel bisecting the herbaceous cover. These stream channel characteristics are more likely to occur in the mapping area rather than meadows found in more humid climates.

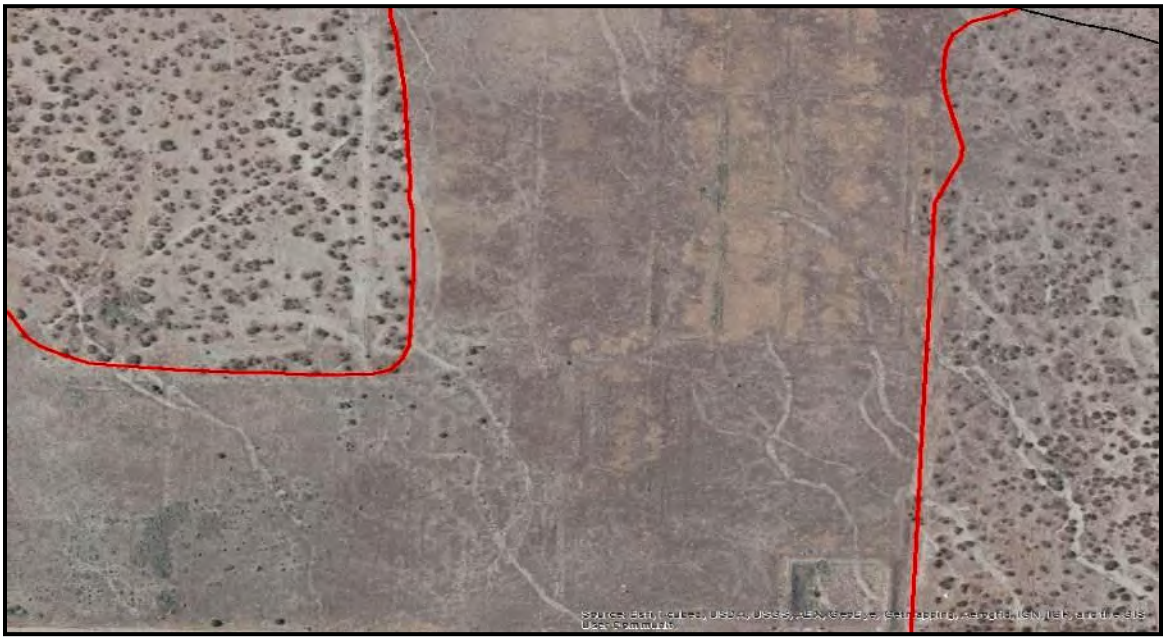
***Juncus arcticus* (var. *balticus*, *mexicanus*) Alliance (3611)**




**DISTRIBUTION:** Stands were found in scattered locations along the western desert margins. In the current study area, *Juncus* is mapped primarily along the Owens River, its floodplain, and lower fan to the west, in the Owens Valley subarea; on the slopes below Piute Mountains in the southern Sierra Nevada of the Jawbone South subarea; and two polygons in Sage Canyon and one at the head of Short Canyon in the Jawbone North subarea.



## Mediterranean California naturalized annual and perennial grassland Group (2330)



The above image depicts a portion of annual grassland dominated by a mix of *Bromus rubens* and other non-native forbs with an inconsistent scattering of *Larrea tridentata* and other shrubs below 1 percent cover. The above example is an old agricultural field.

*Bromus rubens,* along with other annual grasses and forbs, strongly dominates this example of Mediterranean annuals in cover over 15 percent. *Larrea tridentata* increases in the background toward the middle and upper portions of the photo.

**Mediterranean California naturalized annual and perennial grassland Group (2330)**

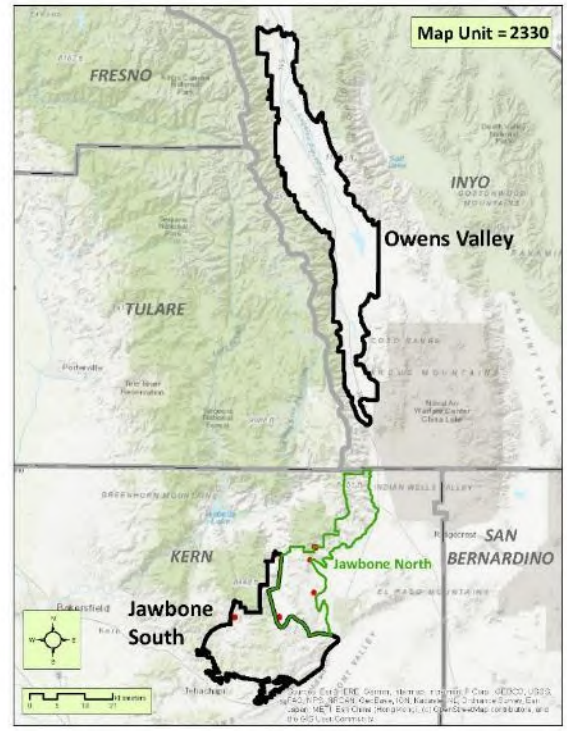
**DESCRIPTION:** Stands are strongly dominated by non-native herbaceous species, lacking evenly distributed diagnostic native plants (which usually constitute less than 5 percent of relative cover). Annual *Bromus, Schismus, Avena, Brassica,* and other non-natives are strongly dominant, with little regular 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*. This type was mapped locally in the southern Sierra Nevada's in and around the human disturbed and grazing lands of Twin Oaks and Lorraine.

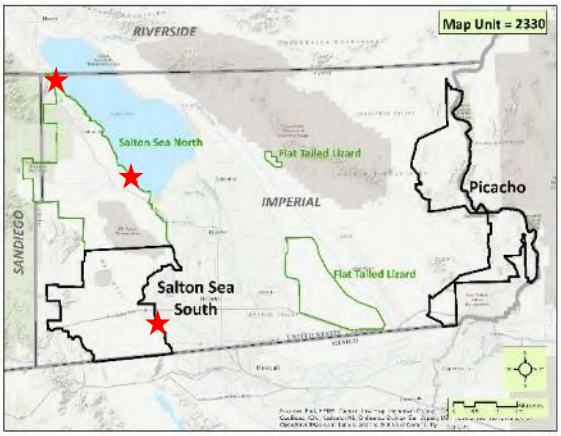
**PHOTOINTERPRETATION SIGNATURE:** Stands tend to have a highly variable signature both in patterning and color. Texture is generally very smooth. Since most available image sources were flown long after the annuals had senesced, signature color in the mapping effort tended to have differing hues of 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, photointerpreters 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 (may include types from 2214, 2221, 4111, 4113, 4115, 5211, 5212, 5419, 7520,) – 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 of 2010 and when subsequent field verification was undertaken.

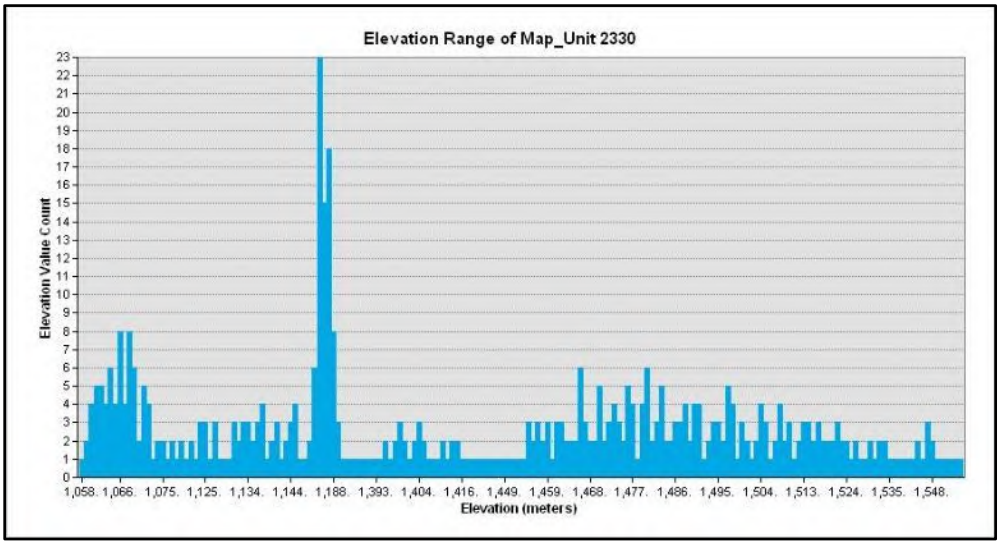
**Mediterranean California naturalized annual and perennial grassland Group (2330)**



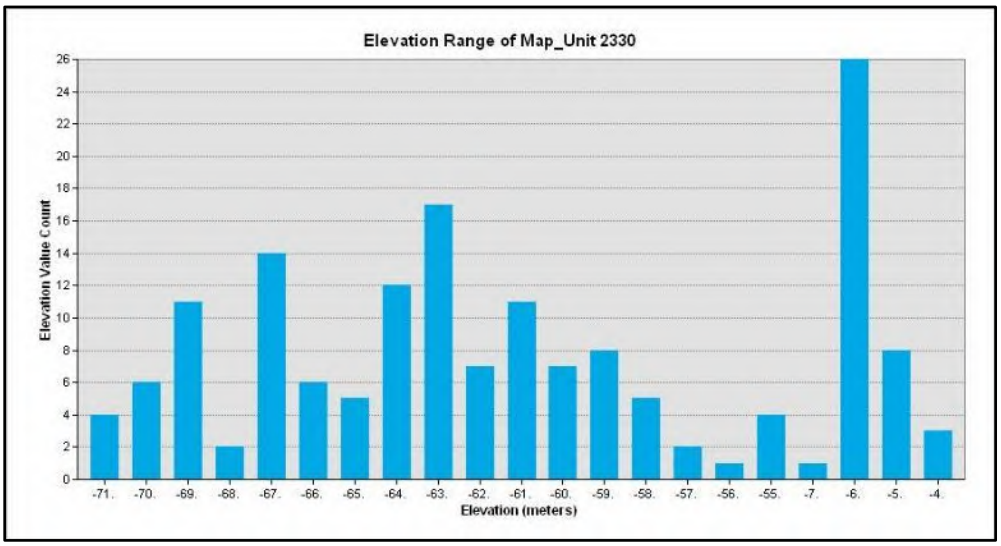




**DISTRIBUTION:** This mapping unit is found throughout most of the DRECP region with the exception of portions of the Colorado Desert, the Yucca Valley-Twentynine Palms area, and western Antelope Valley. Highest concentrations occur in and around the heavily urbanized areas, and also along the Mojave River. In the current study area, this Group is mapped in the interior and desert foothills of southern Sierra Nevada in the Jawbone North and South subareas; and at the western edge of the Salton Sea Trough in the Salton Sea North and South subareas (represented as stars).

**Mediterranean California naturalized annual and perennial grassland Group (2330)**




North subareas




South subareas

## *Phragmites australis – Arundo donax* Semi-natural Stands (1431)

Common reed – Giant reed breaks Semi-natural Stands

This example of dense *Arundo donax* occurs along the margins of the Colorado River. The example depicts a larger than average stand, and *Arundo donax* is the sole dominant.

In this photo, *Arundo donax* is the taller green cane-like grass behind a dense post-growth phase of *Schoenoplectus* showing up as a light tan color adjacent to the river.

***Phragmites australis* – *Arundo donax* Semi-natural Stands (1431)**

**DESCRIPTION:** *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 rows 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), but the semi-natural *Phragmites australis* – *Arundo donax* type is reserved for areas that are not planted or are at least naturalizing and expanding.

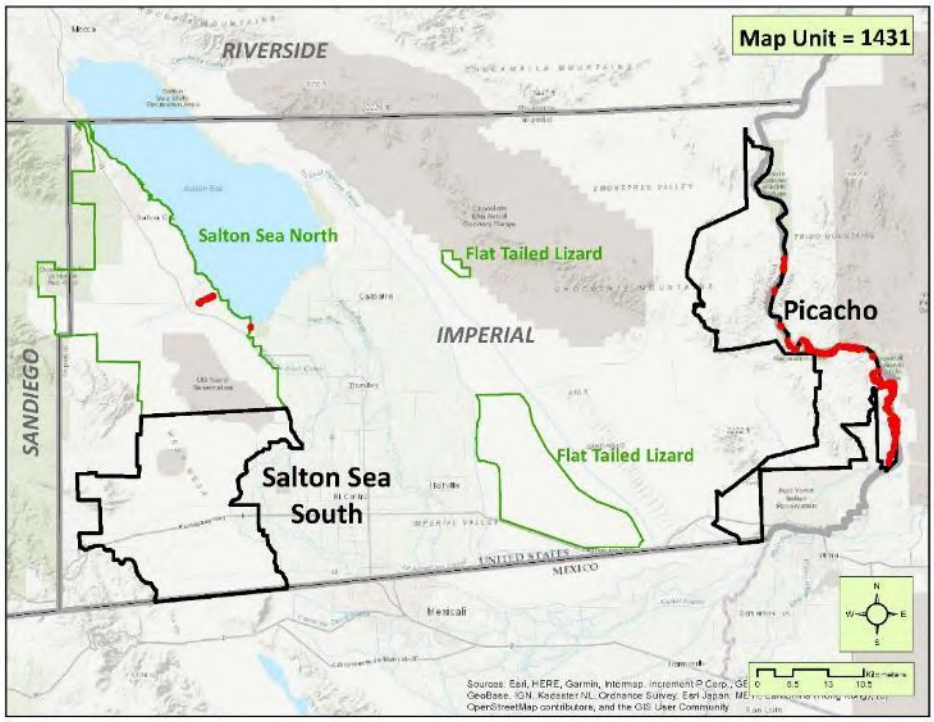
Note: There is a nomenclature change from previous DRECP mapping where this type was named as *Arundo donax* Semi-natural Stands (Menke et al., 2013). The mapping in the Salton Sea North and South subareas follows this nomenclature.

**PHOTOINTERPRETATION SIGNATURE:** Mappable stands occur exclusively along the Colorado River and occur on the drier side of *Schoenoplectus* stands or along the water's edge. Small patches that are below the minimum mapping unit were noted on reconnaissance efforts throughout the study area. Stands typically yield a light green color, with tan components accounting for the previous season's dieback. Image texture has a characteristic stippled patterning from the numerous densely occurring individual tall canes. Stands often form distinct, well-defined margins.

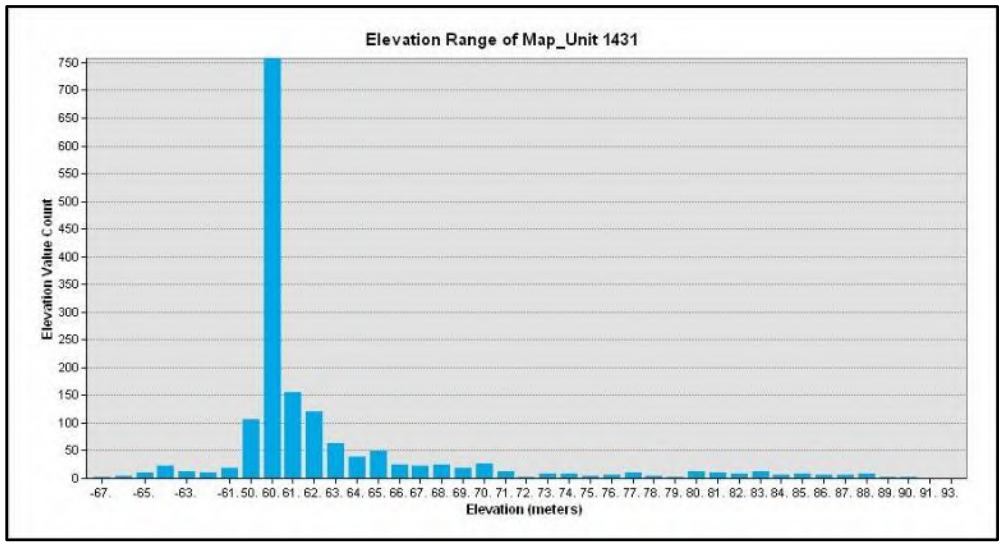
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Phragmites australis ssp. americanus* Association of the *Typha (angustifolia, domingensis, latifolia)* Alliance (3416) – Although not observed as mappable stands in the study area, this species often yields a similar signature to *Arundo donax*. Field verification determined all of the tall cane species along the Colorado River to be *Phragmites australis* – *Arundo donax* Semi-natural Stand. Native *Phragmites australis* stands do occur elsewhere along the southern stretch of the Colorado River and near the Salton Sea in isolated stands and along ditches.

**Phragmites australis – Arundo donax Semi-natural Stands (1431)**




**DISTRIBUTION:** Mappable stands of *Arundo donax* and hybrids of *Phragmites x Arundo* occur primarily along the margins of the Colorado River. In the current study area, this type is mapped in the Colorado River floodplain in the Picacho subarea. Four stands of *Arundo donax* Alliance are mapped along San Felipe Wash and an unnamed drainage, both located in the Salton Sea North subarea.



## *Pleuraphis rigida* Alliance (4122)

Big galleta shrub-steppe Alliance

The clonal signature of *P. rigida* depicted in this example displays a mottled pattern with indistinct crown and stand edges. *L. tridentata* and *A. dumosa* spill over in adjacent stands from the north, contrasted by darker, more defined crowns.

The photo depicts a homogenous stand of *P. rigida* occurring on a sandy flat.

***Pleuraphis rigida* Alliance (4122)**

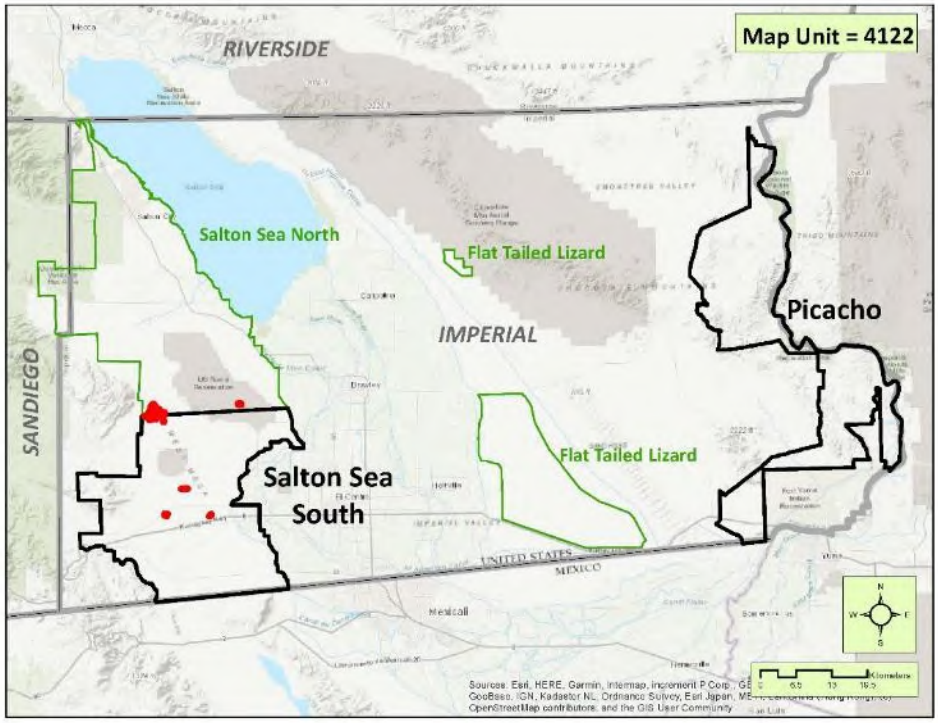
**DESCRIPTION:** In stands of this Alliance the shrubby bunch grass *Pleuraphis rigida* is the dominant perennial species. It may occur with low cover scattered shrubs of *Larrea tridentata, Ambrosia dumosa, Ephedra trifurca,* or other shrub species. Stands typically occur on sand ramps, dune aprons, 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.

**PHOTOINTERPRETATION SIGNATURE:** This bunch grass has a mottled, gray to light brown signature, with cover often ranging widely within the stand. Color tone is generally lighter with more indistinct crown margins in comparison to other subshrubs like *A. dumosa*, which may intermix at very low cover. Clumps of individuals may form small clonal arcs. *P. rigida* prefers sandier soils, which sometimes display a distinctly higher reflectance than surrounding soils. Sandy soils may be used as an indicator of *Pleuraphis* presence but not always.

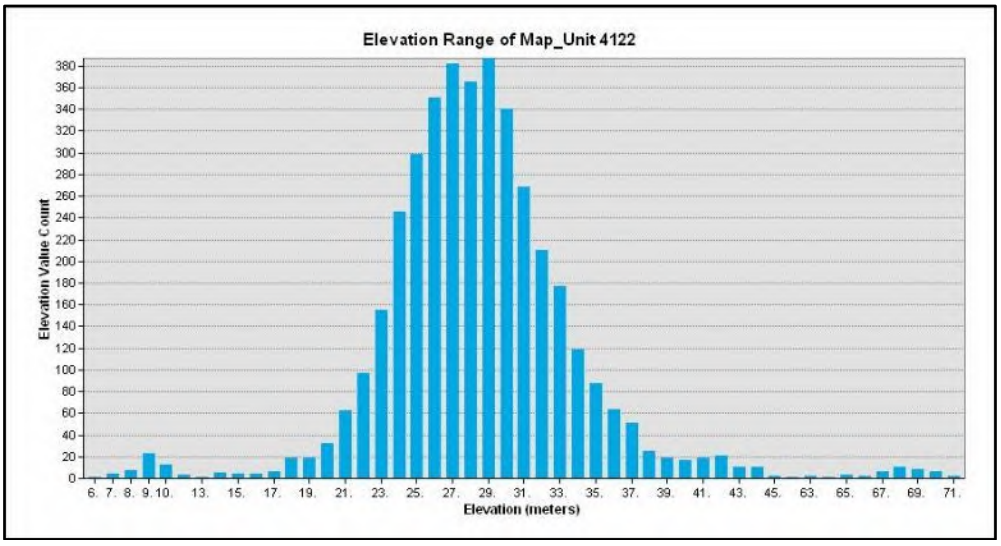
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Ambrosia dumosa* Alliance (4111) – The signature of the plant has a darker gray or brown hue with a slightly more defined crown. *Ambrosia dumosa* occurs on soils that are less sandy and do not yield as bright a signature tone. Unlike *Pleuraphis*, *A. dumosa* normally does not clone.

***Pleuraphis rigida* Alliance (4122)**




**DISTRIBUTION:** Stands of *Pleuraphis rigida* Alliance are uncommon and occur in isolated patches in many areas of the Central Mojave Desert and the Colorado Desert. Most stands occur in patches below the 10-acre MMU, however large stands do occur. In the current study area, 9 sites have been mapped, mostly on West Mesa, in the Salton Sea North and South subarea.



## *Schoenoplectus* (*acutus, californicus)* Alliance (3412)

Hardstem bulrush, California bulrush Mapping Unit

The above stand is located along a small oxbow off the Colorado River. The vegetation is strongly dominated by *Schoenoplectus.* Emergent light-colored tufts toward the center of the stand are *Arundo donax* canes.

This photo depicts *Schoenoplectus* in varying stages of growth surrounding a small pond adjacent to the Colorado River.

***Schoenoplectus (acutus, californicus)* Mapping Unit (3412)**

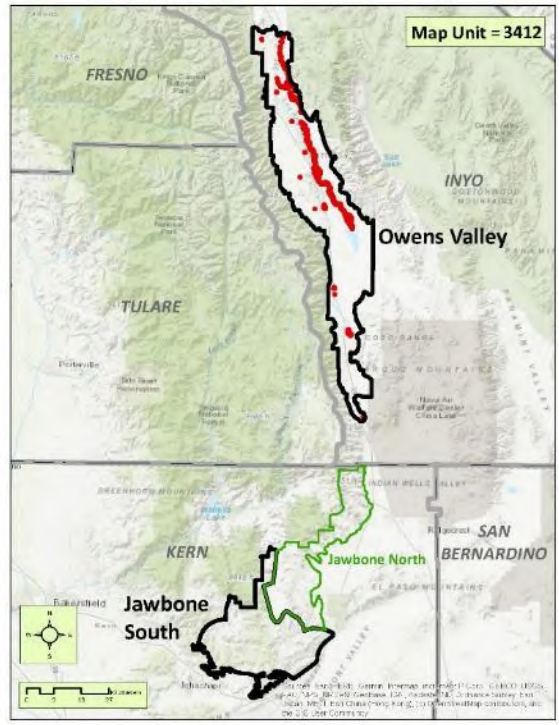
**DESCRIPTION:** *Schoenoplectus acutus* or *S. californicus*, tall bulrushes, dominate the stand. Small stands occur in all areas of the study where ponds and sluggish permanently flowing freshwater exist. Both species have similar ecologies in the study area. *S. acutus* occurs in fresh or brackish water; *S. californicus* appears more regularly at edges of open water.

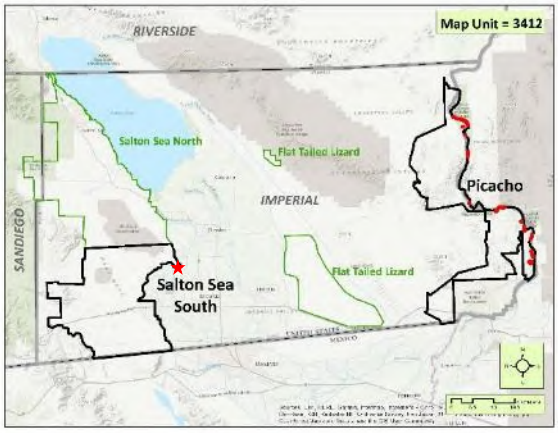
**PHOTOINTERPRETATION SIGNATURE:** Signature is highly dependent on the amount of senesced vegetation in the stand along with the presence of open areas of standing water. New annual growth generally is not widely represented on image datasets which are flown early in the summer before the young stems emerge. For both species, signature texture is smooth to finely stippled, and patterning ranges from fairly uniform to highly mottled. Patterning is determined primarily by the irregular distribution of the new growth and the previous year's growth within a stand. The color of senesced growth ranges from a tan to dark gray and is highly variable within the stand.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Typha (angustifolia, domingensis, latifolia)* Association (3415) of the *Typha (angustifolia, domingensis, latifolia)* Alliance (3416) – Marshes dominated by *Typha* are distinguished based on photo signature only. No apparent environmental distinctions from *Schoenoplectus* were observed during reconnaissance or later noted on the imagery during the mapping effort. However, mapped stands do occur less frequently along the Colorado River and are more often mapped along the edges of small farm ponds and reservoirs. In most settings, *Typha* has a lighter tan signature color when observing previous year's growth, which was the typical growth cycle on all image datasets.

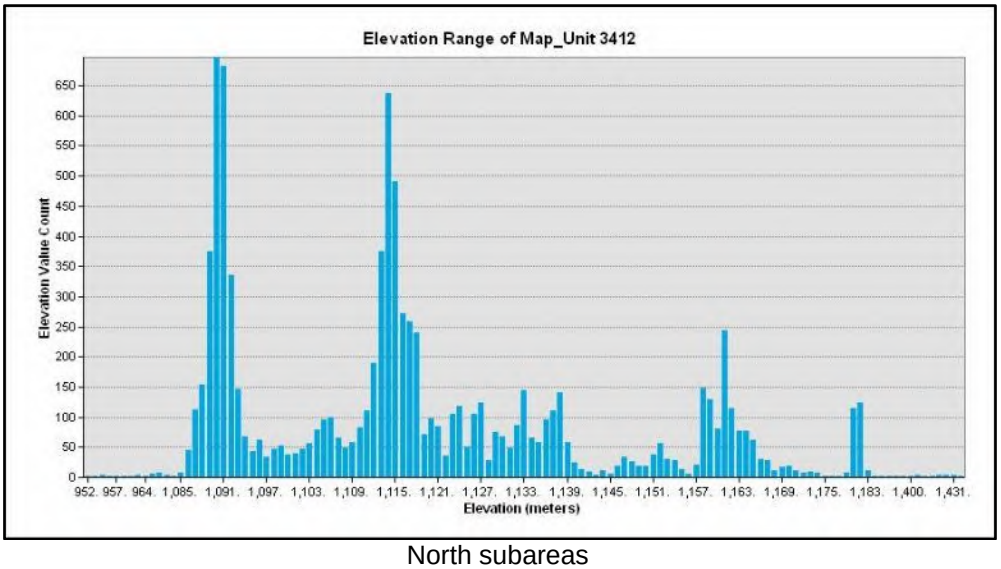
***Schoenoplectus acutus, californicus* Mapping Unit (3412)**



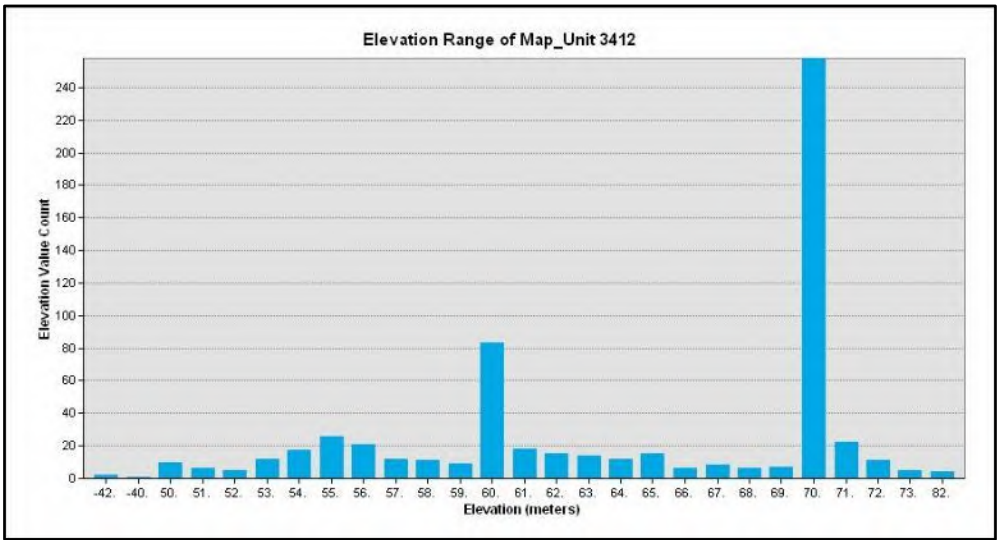




**DISTRIBUTION:** Stands are mapped in isolated locations throughout the DRECP area, with over 90 percent occurring along the Colorado River. In the current study area, the Alliance is mapped all along the Owens River and on its adjacent floodplain, and at Haiwee Reservoir in the Owens Valley subarea; along the lower Colorado River floodplain in the Picacho subarea; and one polygon (represented by a star) in the western edge of Salton Trough on the New River in the Salton Sea South subarea.

***Schoenoplectus acutus, californicus* Mapping Unit (3412)**

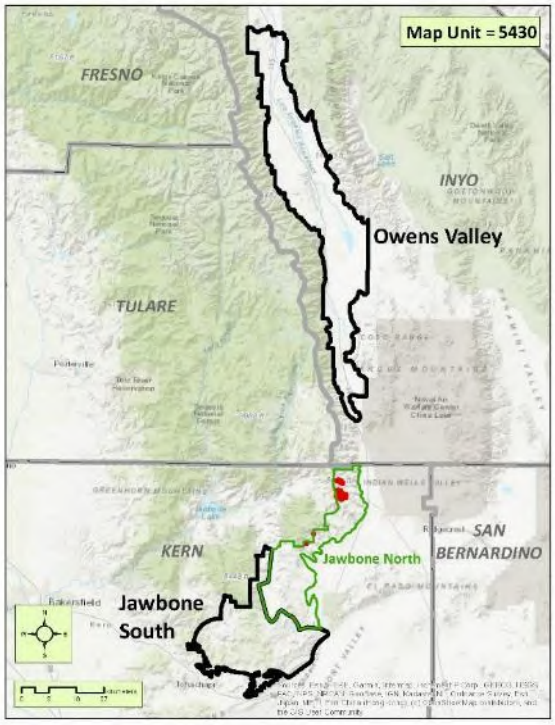



North subareas

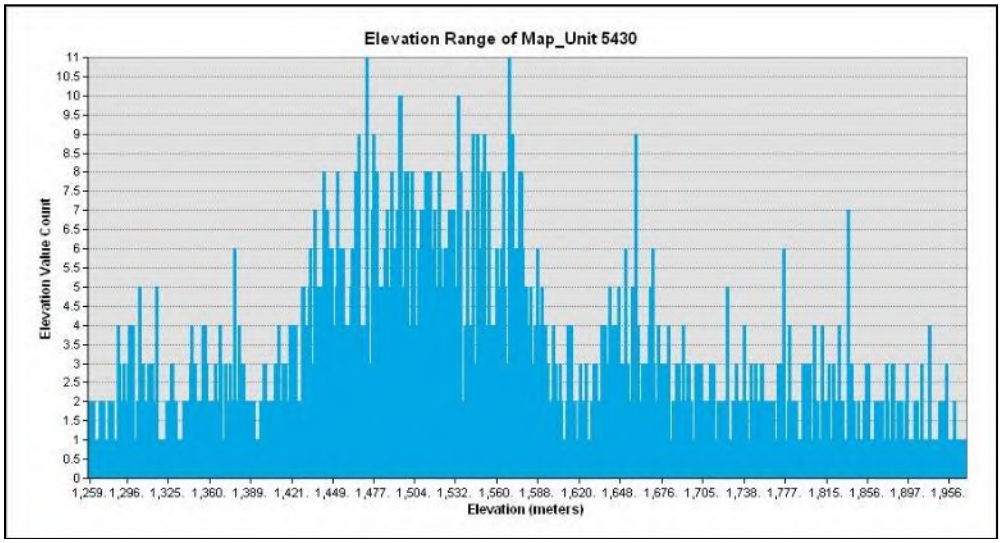



South subareas

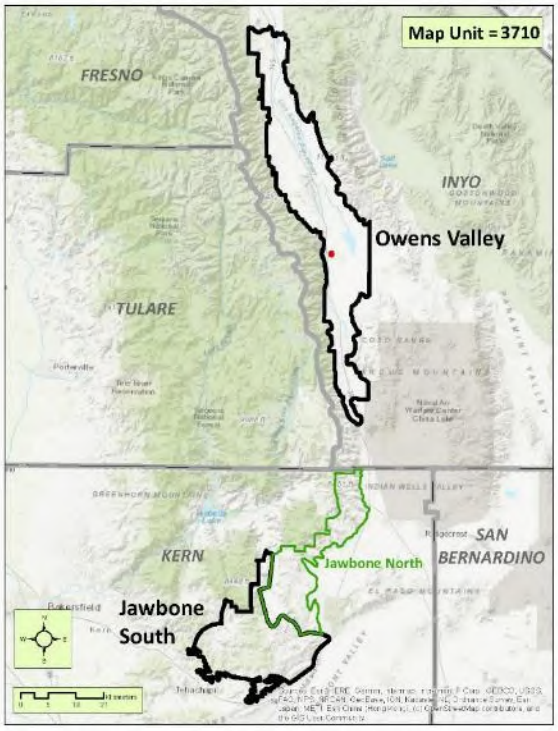
## Southern Great Basin semi-desert grass Group (5430)




**DISTRIBUTION:** Stands of this Group were infrequently mapped in the Jawbone North subarea. 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. Mapping was based on field data and locally extrapolated.



## Southwestern North American alkali marsh/seep vegetation Group (3710)

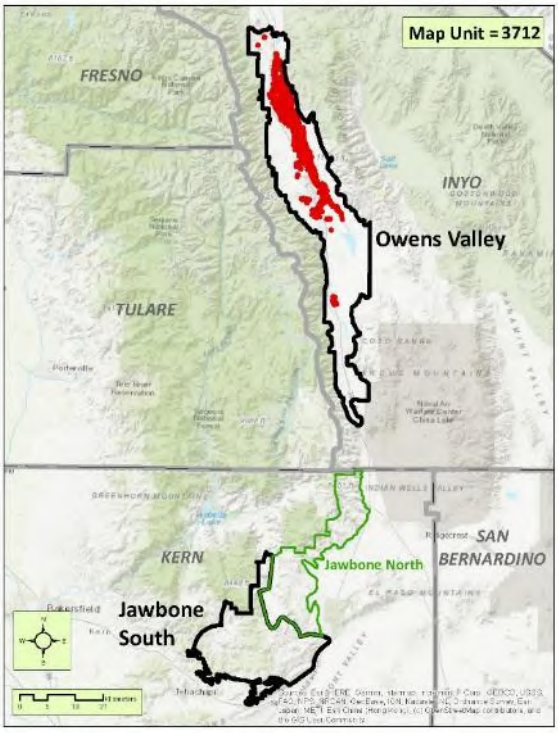



**DISTRIBUTION:** In the current study area, one stand was mapped on the western edge of Owens Lake in the Owens Valley subarea. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.

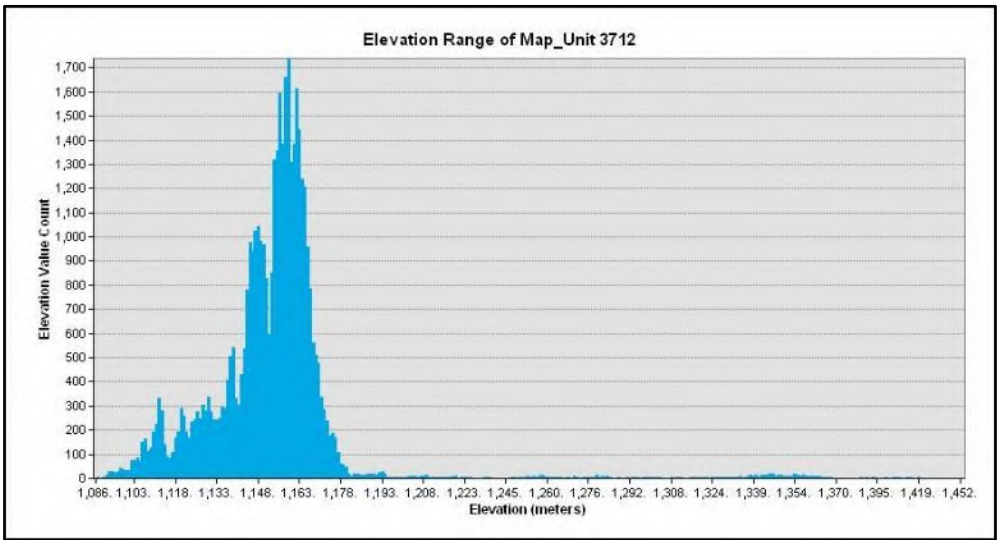
**Due to small aerial extent no Elevation Range Chart is provided**

## *Sporobolus airoides – Muhlenbergia asperifolia – Spartina gracilis* Alliance (3712)

Alkali sacaton – Scratchgrass – Alkali cordgrass meadow Alliance




**DISTRIBUTION:** In the current study area, stands of this *Sporobolus airoides* were mapped all along the Owens River floodplain, and in meadows near Olancha south of Owens Lake, in the Owens Valley subarea. All stands are associated with moist to saturated alkaline soils. However, environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.



## *Typha (angustifolia, domingensis, latifolia)* Alliance (3416)

Cattail marshes Alliance

The image depicts a patch of *Typha* on the upstream side of a small island in the Colorado River. An area of *Schoenoplectus* occurs immediately to the west in some slower-moving water.

In this photo, *Typha* dominates in a small pond displaying midsummer growth. In new and high season growth phases, it is difficult to distinguish bulrush species from cattail.

***Typha (angustifolia, domingensis, latifolia)* Alliance (3416)**

**DESCRIPTION:** *Typha* spp. and/or *Phragmites australis ssp. americanus* dominate the stands of this Alliance. 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 in the Cajon Pass region.

*Phragmites australis* ssp. *americanus* is the tall stoloniferous wetland grass. 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.

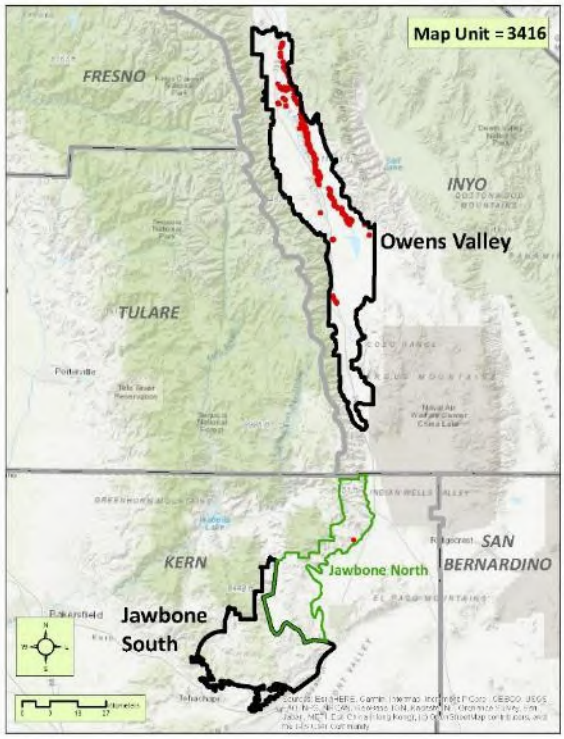
Note: As part of this project effort, additional classification data collection and analysis were performed for the Jawbone South and Owens Valley subareas. Floristic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Phragmites australis* Alliance (3411) and the *Typha (angustifolia, domingensis, latifolia)* Alliance (3415) were reassigned as Association and Mapping Unit of the new *Typha (angustifolia, domingensis, latifolia)* Alliance (3416). The Salton Sea region, which includes Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.

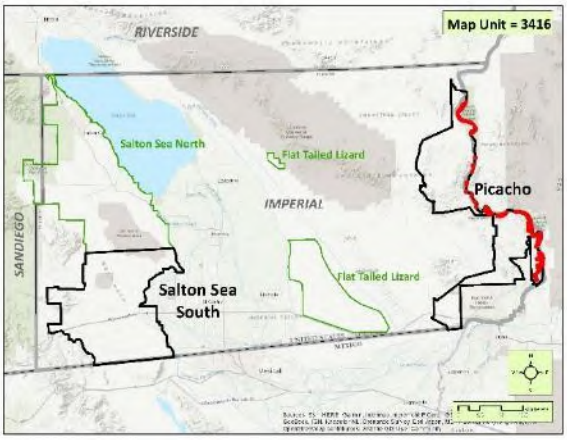
**PHOTOINTERPRETATION SIGNATURE:** Stands occur in most small perennial farm ponds and along the margins of reservoirs. The key to this and the *Schoenoplectus* mapping unit are their interface with perennial water. In most circumstances, the interface is between dense cover and open water. Post season growth in senesced conditions tends to yield a light tan signature. Full mature growth often has a stippled texture.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Phragmites australis – Arundo donax* Semi-natural Stands (1431) – Stands are difficult to separate both in the field and from imagery. It was determined that stands occurring within the mapping area along the Colorado River were for the most part *Arundo donax,* while those in the Salton Trough were most likely native *Phragmites.*
- *Schoenoplectus (acutus, californicus)* Alliance (3412) – There are no distinguishing ecological characteristics detectable using remote sensing techniques that may help in separating out this mapping unit from *Typha.* However, most mapped stands occur along the Colorado River, whereas stands of *Typha* are more likely found along margins of irrigation ponds and small reservoirs. *Typha* is associated with recent disturbance and with higher nutrient loads than *Schoenoplectus* (*acutus, californicus*). Stands tend have a darker gray or brown signature color in typical senesced growth phases. Patterning tends to vary more across the stand, reflecting the previous year's growth cover characteristics.

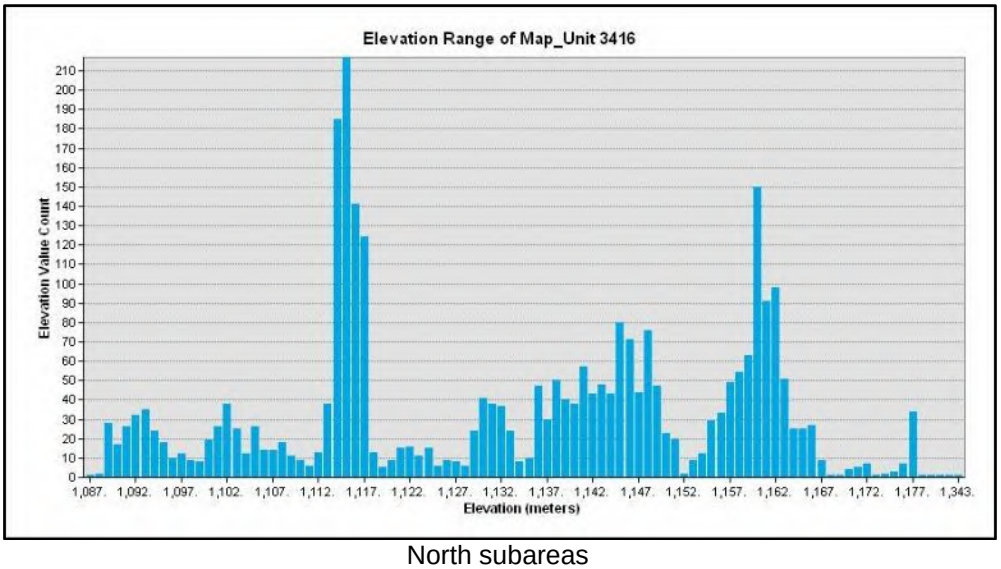
***Typha (angustifolia, domingensis, latifolia)* Alliance (3416)**



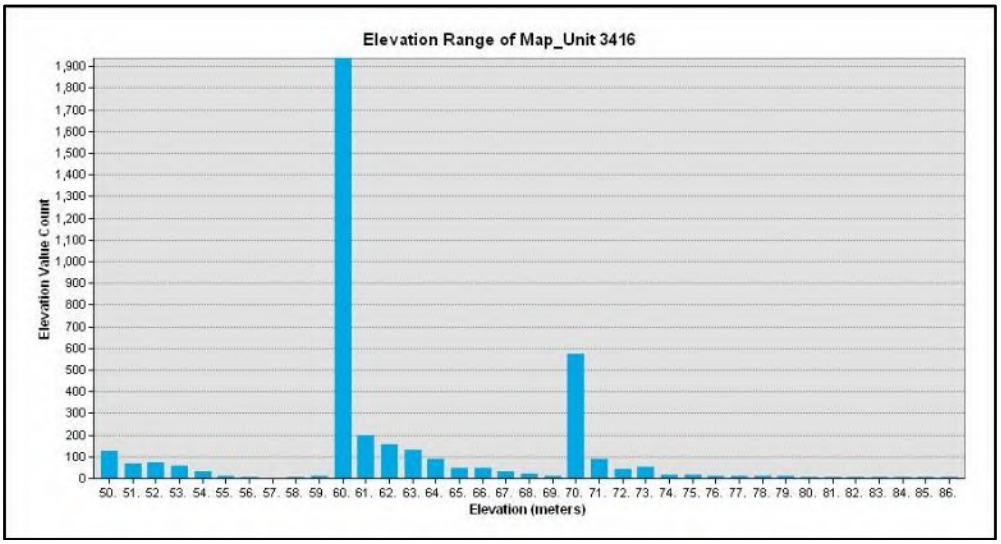




**DISTRIBUTION:** Stands occur in perennial water settings and are common in less active lagoons and side channels of the Colorado River, and along stagnant canals with permanently standing water adjacent to agricultural lands in the Salton Sea Trough. In the current study area, this Alliance is mapped along the Owens River and its adjacent floodplain in the Owens Valley subarea; as one polygon mapped at Soldier Wells in Freeman Canyon in the Jawbone North subarea; all along the Colorado River and its adjacent floodplain in the Picacho subarea; and mainly along San Felipe Creek and adjacent Salton Sea Trough sites (mapped as *Typha* Mapping Unit code 3415, see below) in the Salton Sea North subarea.

***Typha (angustifolia, domingensis, latifolia)* Alliance (3416)**



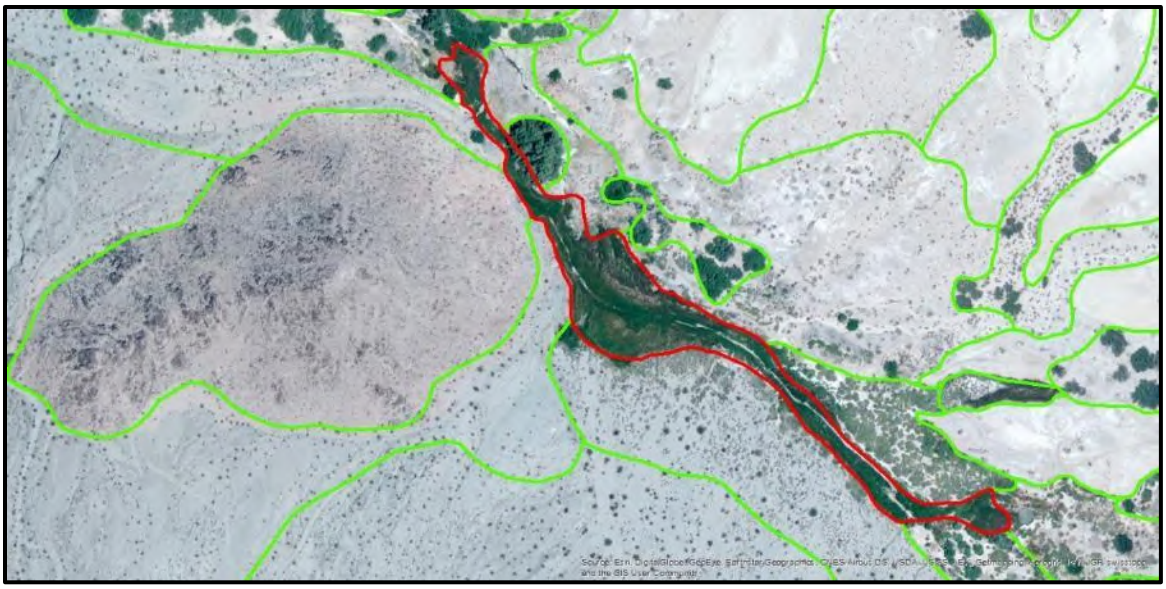

North subareas




South subareas

## *Phragmites australis* ssp. *americanus* Association (formerly Alliance) (3411)

American common reed marshes Alliance



This image depicts an example of *Phragmites australis* occurring in Salt Creek.

In this photo, *Phragmites australis* forms a linear stand along Salt Creek. Note that the yellow arrow points to the *Phragmites australis*.

***Phragmites australis* ssp. *americanus* Association (3411)**

**DESCRIPTION:** *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 (VegCAMP, 2012). Most are below mappable size for this project. Hybrids between the native races of the American Southwest and non-native Eurasian races are likely in some areas and make conservation prioritization difficult without detailed taxonomic study. Most stands in isolated wetlands appear native (VegCAMP, 2012).

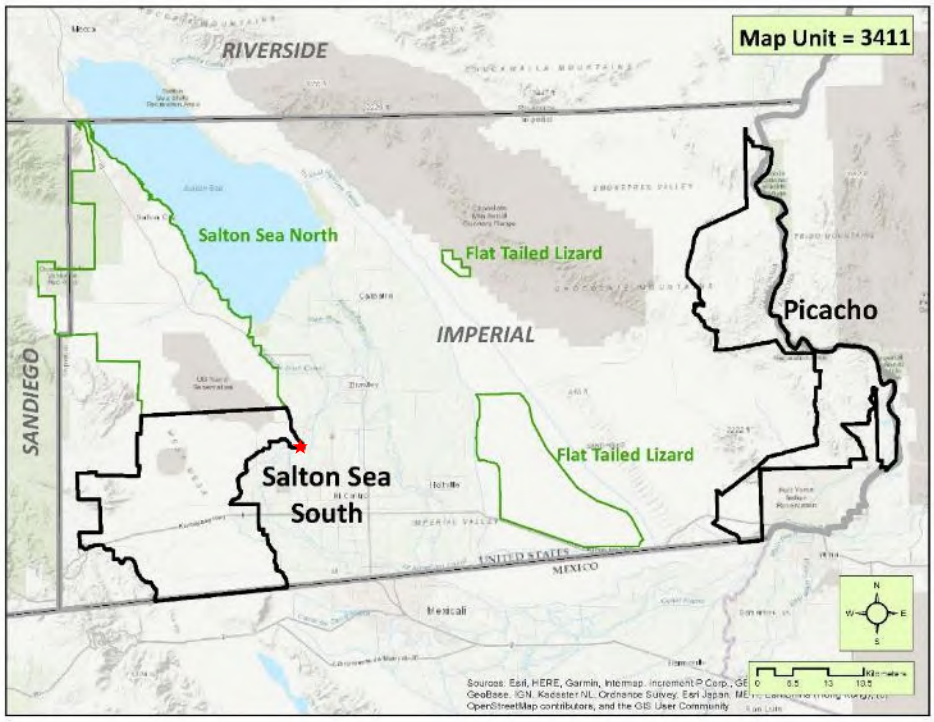
Note: As part of this project effort, additional classification data collection and analysis were performed for the Jawbone South and Owens Valley subareas. Floristic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Phragmites australis* Alliance (3411) and the *Typha (angustifolia, domingensis, latifolia)* Alliance (3415) were reassigned as Association and Mapping Unit of the new *Typha (angustifolia, domingensis, latifolia)* Alliance (3416). The Salton Sea region, which includes Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.

**PHOTOINTERPRETATION SIGNATURE:** Signature characteristics within stands assigned to this Alliance vary considerably depending on the age of the stand, time of the growing season and pureness of the stand. All examples tend to have a smooth to finely stippled texture that can be slightly mottled depending on the presence of certain shrub species such as *Tamarix* and/or *Pluchea sericea.* Early-season examples tend to be a brighter green, while older stands yield less bright hues.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Phragmites australis – Arundo donax* Semi-natural Stands (1431)*:* Stands are difficult to separate both in the field and from imagery. It was determined that stands occurring within the mapping area along the Colorado River were for the most part *Arundo donax,* while those in the Salton Trough were most likely native *Phragmites.*

***Phragmites australis* ssp. *americanus* Association (3411)**




**DISTRIBUTION:** Stands are restricted for the most part to the Salton Sea Trough zone. In the current study area, one polygon (represented by a star) was mapped on the western side of Salton Sea Trough along the New River in Salton Sea South subarea.

**Due to small aerial extent no Elevation Range Chart is provided**

## *Typha (angustifolia, domingensis, latifolia)* Mapping Unit (formerly Alliance) (3415)

Cattail marshes Alliance

The image depicts a patch of *Typha* on the upstream side (right) of a small island in the Colorado River. An area of *Schoenoplectus* occurs immediately to the west in some slower-moving water.

In this photo, *Typha* dominates in a small pond displaying midsummer growth. In new and high season growth phases, it is difficult to distinguish bulrush species from cattail.

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***Typha (angustifolia, domingensis, latifolia)* Mappng Unit (3415)**

**DESCRIPTION:** *Typha* spp. dominate the stands of this Alliance. Most stands growing in water with slightly alkaline or saline chemistry are *T. domingensis*. Stands of *T. latifolia* have only been inventoried in fresh water at Lost Lake in the Cajon Pass region.

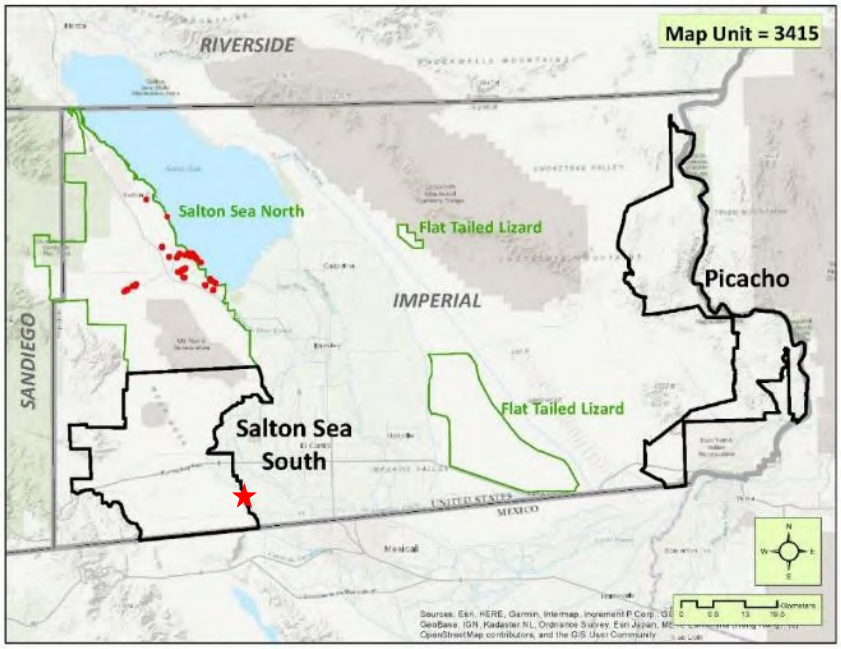
Note: As part of this project effort, additional classification data collection and analysis were performed for the Jawbone South and Owens Valley subareas. Floristic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Phragmites australis* Alliance (3411) and the *Typha (angustifolia, domingensis, latifolia)* Alliance (3415) were reassigned as Association and Mapping Unit of the new *Typha (angustifolia, domingensis, latifolia)* Alliance (3416). The Salton Sea region, which includes Salton Sea South, Salton Sea North, and the Flat-Tailed Horned Lizard subareas were mapped prior to the classification work. As a result, these subareas were mapped and accuracy assessment completed using the original classification from the existing DRECP project.

**PHOTOINTERPRETATION SIGNATURE:** Stands occur in most small perennial farm ponds and along the margins of reservoirs. The key to this and the *Schoenoplectus* mapping unit are their interface with perennial water. In most circumstances, the interface is between dense cover and open water. Postseason growth in senesced conditions tends to yield a light tan signature. Full mature growth often has a stippled texture.

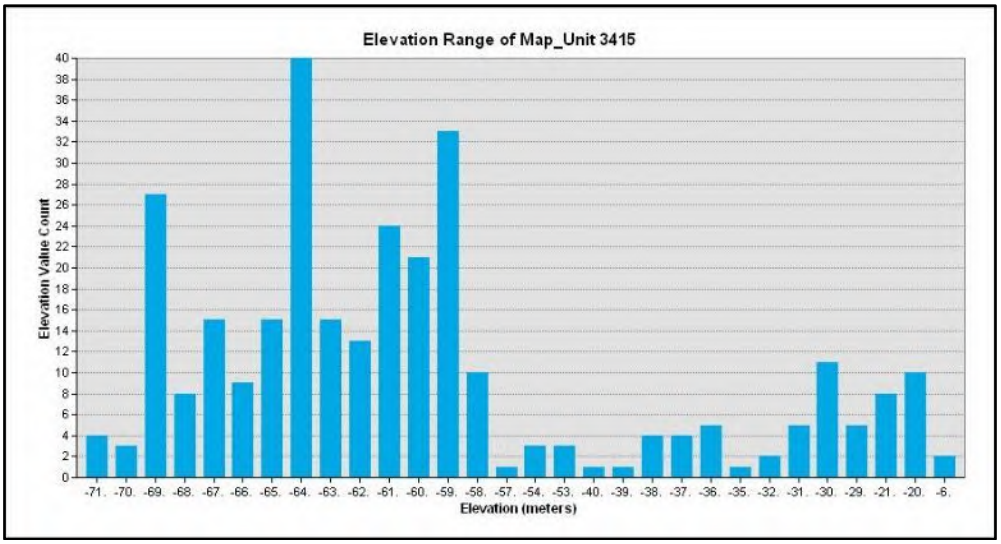
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Schoenoplectus (acutus, californicus)* Alliance (3412) – There are no distinguishing ecological characteristics detectable using remote sensing techniques that may help in separating out this mapping unit from *Typha.* However, most mapped stands occur along the Colorado River, whereas stands of *Typha* are more likely found along margins of irrigation ponds and small reservoirs. *Typha* is associated with recent disturbance and with higher nutrient loads than *Schoenoplectus (acutus, californicus*). Stands tend to have a darker gray or brown signature color in typical senesced growth phases. Patterning tends to vary more across the stand, reflecting the previous year's growth cover characteristics.

***Typha (angustifolia, domingensis, latifolia)* Mapping Unit (3415)**




**DISTRIBUTION:** Over half of the mapped stands in the DRECP area occur in perennial water settings, and, stands are common in small less active lagoons and side channels along the Colorado River and along stagnant canals with permanently standing water adjacent to agricultural lands in the Salton Sea Trough zone. In the current study area, *Typha* is mapped mainly along San Felipe Creek and adjacent west Salton Sea sites in the Salton Sea North subarea, and at one site along Westside Main Canal north of Highway 98 in the Salton Sea South subarea.



## Vancouverian & Rocky Mountain naturalized annual grassland Group (3110)

(Also known as the Great Basin & Intermountain Ruderal Shrubland & Grassland Group)

This image shows a higher elevation herbaceous stand dominated by *Bromus tectorum* with scattered patches of shrubs. The grassy opening is surrounded by a stand of *dominant Quercus chrysolepis* to the south and a mixed stand of *Pinus jeffreyi* and *Quercus kelloggii* to the north.

In the photo, *Bromus tectorum* is scattered in the openings and understory of a stand of *Quercus kelloggii* and *Pinus jeffreyi*.

**Vancouverian & Rocky Mountain naturalized annual grassland Group (3110)**

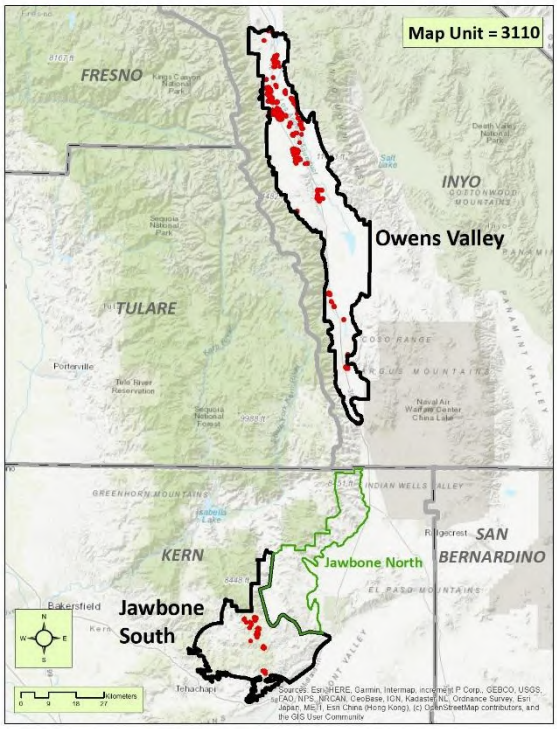
**DESCRIPTION:** Stands strongly dominated at greater than 80% relative cover, by non-native annual cool season *Bromus tectorum* or *Bassia* spp. and/or *Salsola* spp. *Bromus tectorum* was observed in the field in upper Jawbone Canyon. In the Owens Valley, it is mapped where *Bassia* spp. strongly dominates the herbaceous layer in alkaline settings or in previously irrigated pasturelands that have since dried up.

**PHOTOINTERPRETATION SIGNATURE:** *Bassia scoparia* yields a dark but dull green signature similar to that of *Robinia spp.* Annual grasses are a part of the stand which depict patches of gold color which reflect the seasonal grass component. The combination of these two color patterns in herbaceous context are key to identifying this group. In abandoned pasturelands, the signature of the annuals is generally a light tan color varying slightly across the stand due to changes in phonological conditions from one area to the next.

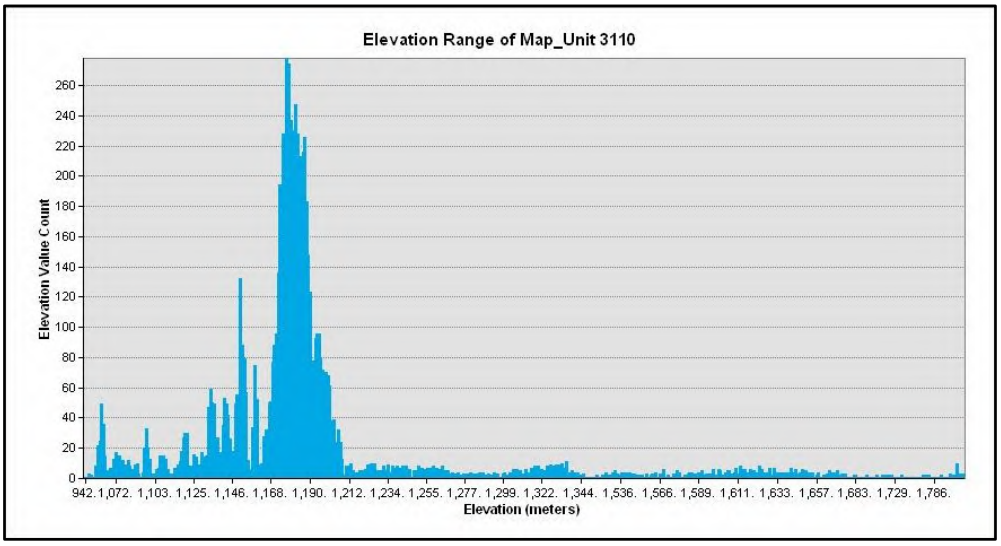
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- California annual and perennial grassland (Native component) Mapping Unit (2305) – There is currently no reliable signature pattern that allows differentiating these types. Photointerpreters model based on regional and local settings pertaining to species range, phenology and substrate conditions.
- Mediterranean California naturalized annual and perennial grassland Group (2330) - There is currently no reliable signature pattern that allows differentiating these types. Photointerpreters model based on regional and local settings pertaining to species range, phenology and substrate conditions.

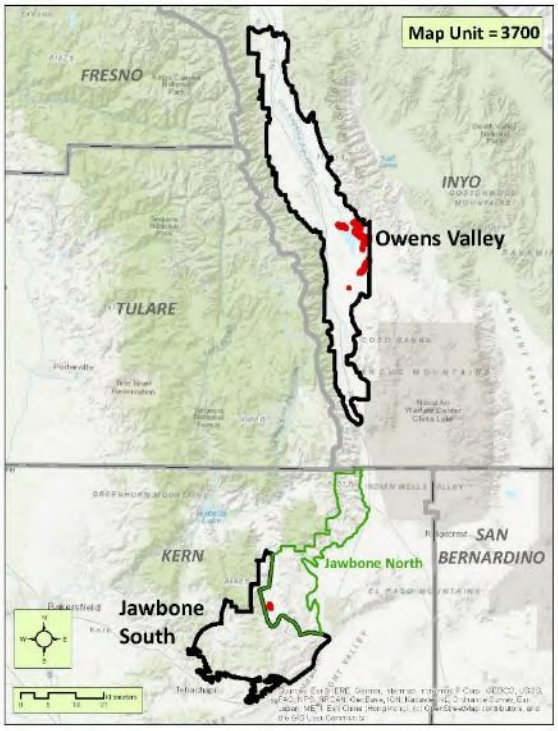
**Vancouverian & Rocky Mountain naturalized annual grassland Group (3110)**



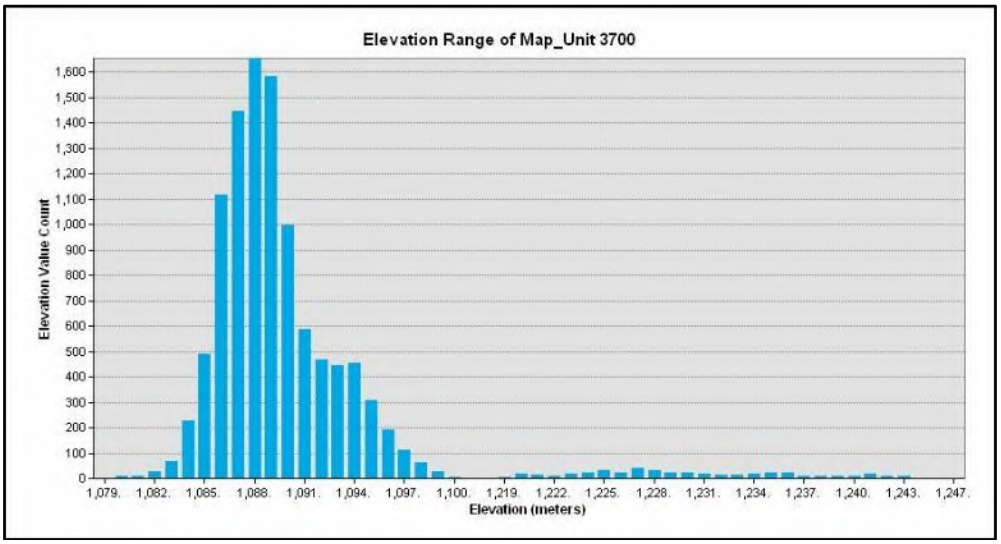

**DISTRIBUTION:** In the current study area, this Group is mapped primarily on the valley bottom and lower fans of the Owens Valley subarea; and the on the slopes of the Piute Mountains in the interior southern Sierra Nevada of the Jawbone South subarea based on field information.



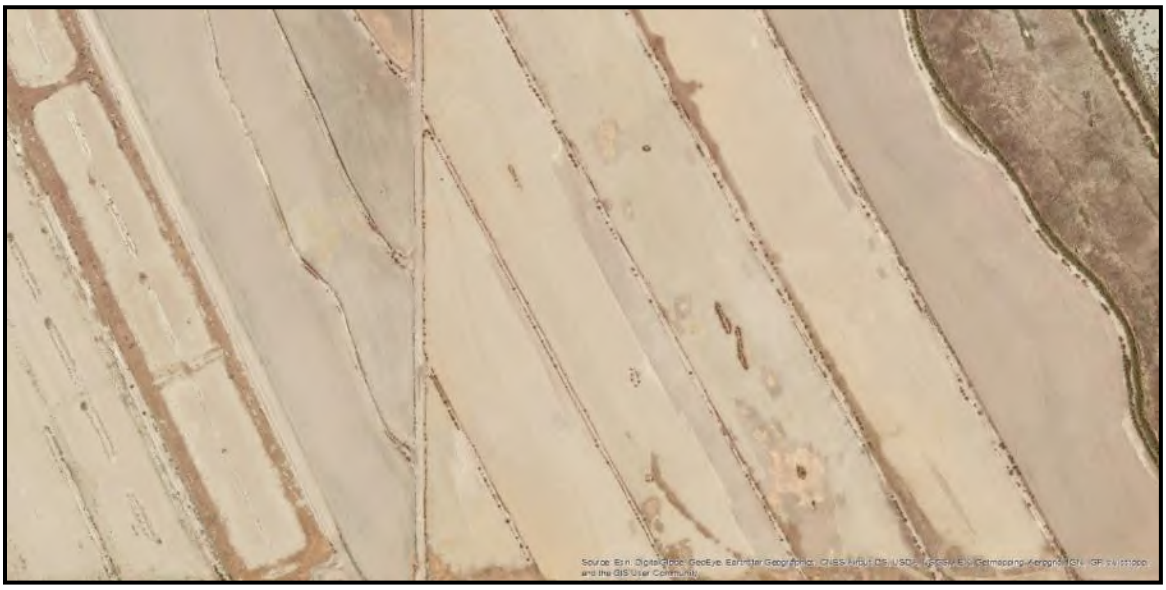
## Warm Semi-Desert/Mediterranean Alkali-Saline Wetland Macrogroup (3700)




**DISTRIBUTION:** Stands are mapped at the Macrogroup level when the Alliance is not discernible from the imagery. The only stands mapped to this Macrogroup are located on around the eastern part of Owens Lake in the Owens Valley subarea and one site in the Kelso Valley of the Jawbone North subarea. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.



## Western North American Freshwater Marsh Macrogroup (3400)



The above image depicts a portion of the Imperial Wildlife Area (Wister Unit). Vegetation includes *Crypsis schoenoides, Bolboschoenus maritimus* and *Typha* spp. Note: This screenshot is a portion of a larger polygon whose boundaries are not shown.

This picture depicts *Crypsis schoenoides* surrounded by *Bolboschoenus maritimus* and *Typha* spp. with emergent *Tamarix* spp.

**Western North American Freshwater Marsh Macrogroup (3400)**

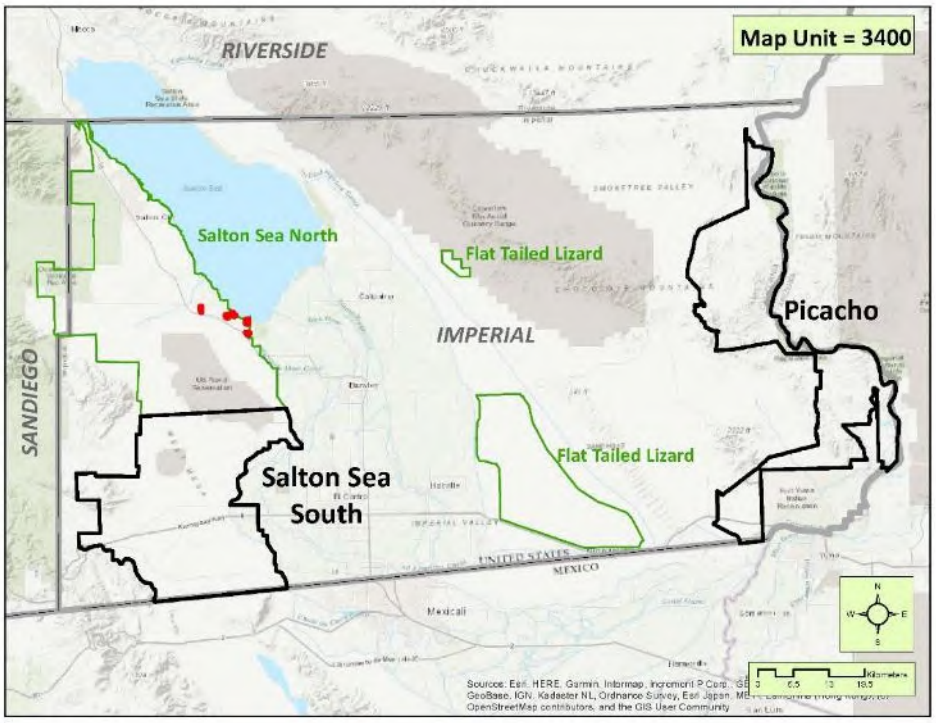
**DESCRIPTION:** Stands of this Macrogroup are dominated by tall to short herbs and graminoids. This Macrogroup is mapped exclusively in areas used for public and privately-owned managed wetland purposes. Species composition varies considerably from year to year depending on flooding practices for the particular season. This makes it difficult to classify these areas to the Alliance level. Common species within these managed wetlands include *Crypsis schoenoides, Typha angustifolia,* and *T. latifolia.* Within these managed wetlands, small areas of vegetation in different Macrogroups may occur such as *Bolboschoenus maritimus* and *Phragmites australis.*

**PHOTOINTERPRETATION SIGNATURE:** Vegetation within this Macrogroup is characterized by a signature denoting anthropogenic disturbance. Stands of vegetation are arranged within each impoundment pond based on manmade flooding regimes. All photointerpretation patterns and textures are aggregated into the human-developed entity, which in this case is the impoundment feature containing the managed wetlands. Therefore, all signature characteristics vary considerably across the mapped feature. Defining margins are often narrow berms, roads and agricultural areas.

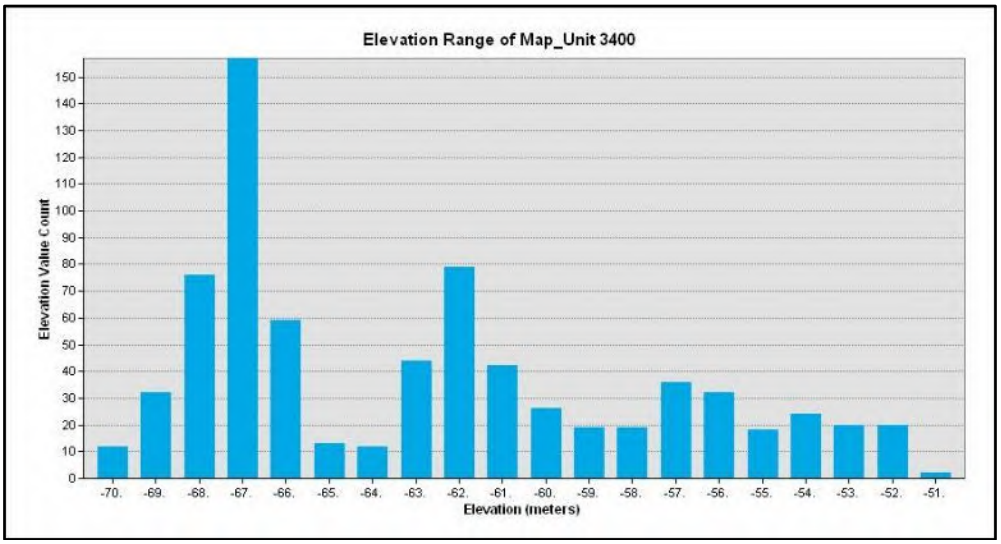
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- Agriculture (9200): Young grain crops and early spring fallow fields often yield a signature similar to early development of wetlands in managed wildlife areas. Setting and ownership are crucial factors in determining whether the vegetation will be used for managed wetland purposes.

**Western North American Freshwater Marsh Macrogroup (3400)**

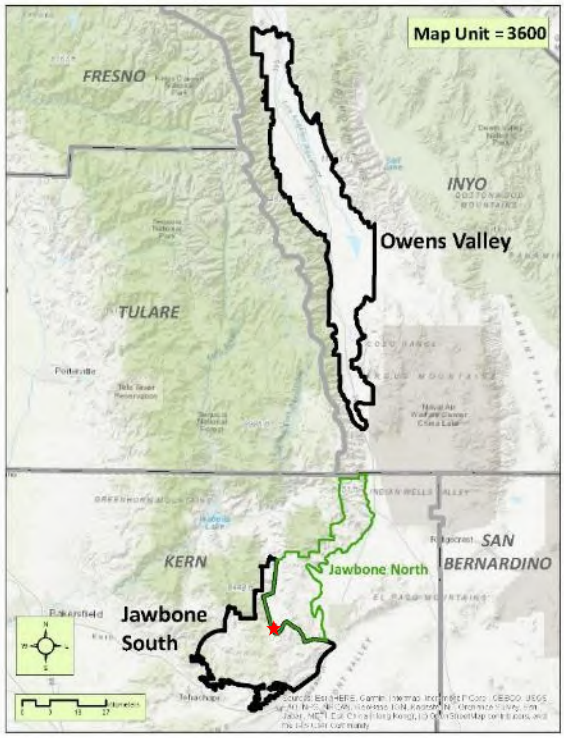



**DISTRIBUTION:** In the current study area, stands are mapped on the western side of the Salton Sea Trough zone in the Salton Sea North subarea.

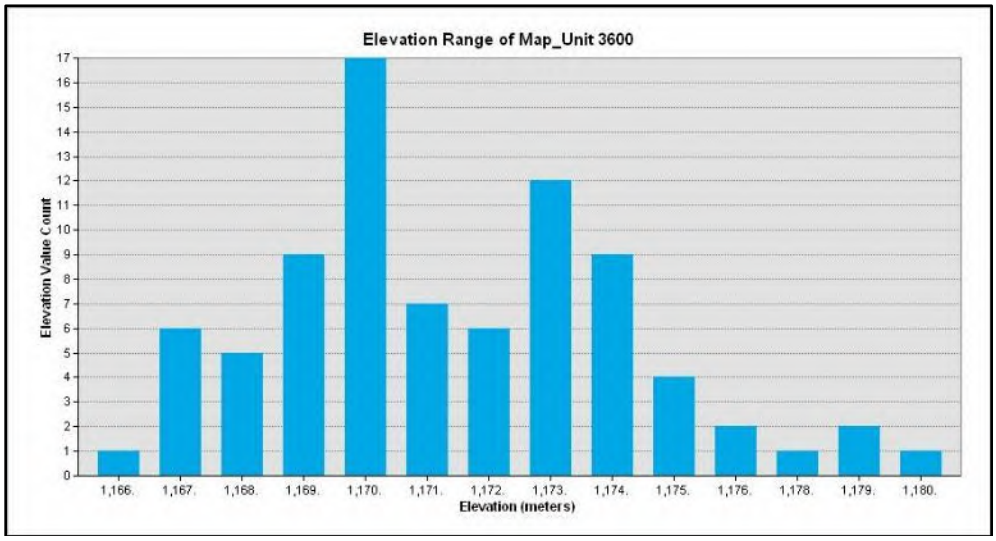


## Western North America Wet Meadow & Low Shrub Carr Macrogroup (3600)

(Also known as the Western North American Montane & Subalpine Wet Shrubland & Wet Meadow Macrogroup)




**DISTRIBUTION:** Two polygons (represented by a star) of this Macrogroup were mapped in the Kelso Valley of the Jawbone North subarea, none of which were verified or visited in the field. These stands were mapped at the Macrogroup level because the Alliance was not discernible from the imagery. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.

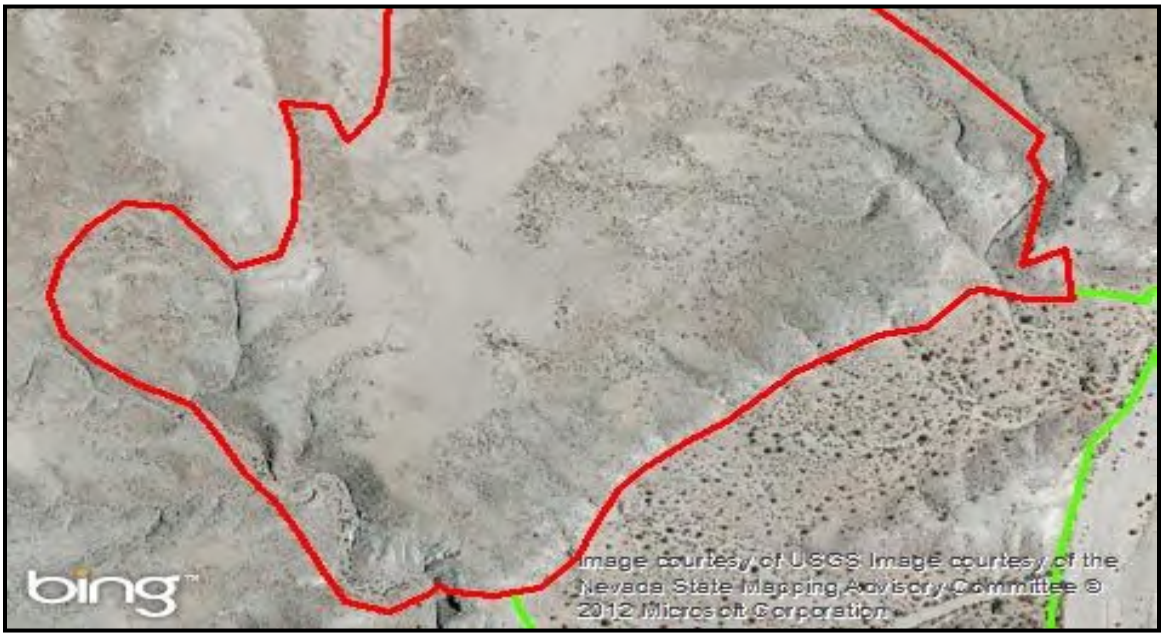


## Sparse Types

*Atriplex hymenelytra* Alliance (6111)
*Chorizanthe rigida – Geraea canescens* Desert Pavement Sparsely Vegetated Alliance (6117)
*Dicoria canescens – Abronia villosa - Panicum urvilleanum* Alliance (6121)
Massive sparsely vegetated rock outcrop Mapping Unit (6115)
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)
Sparsely vegetated playa (Ephemeral annuals) Mapping Unit (6116)
Unvegetated wash and river bottom Mapping Unit (6114)

## *Atriplex hymenelytra* Alliance (6111)

Desert holly scrub Alliance




The image shows *Atriplex hymenelytra* Alliance on light-colored alkaline soils.

The photo shows sparse light-colored *Atriplex hymenelytra* on rocky volcanic substrate.

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

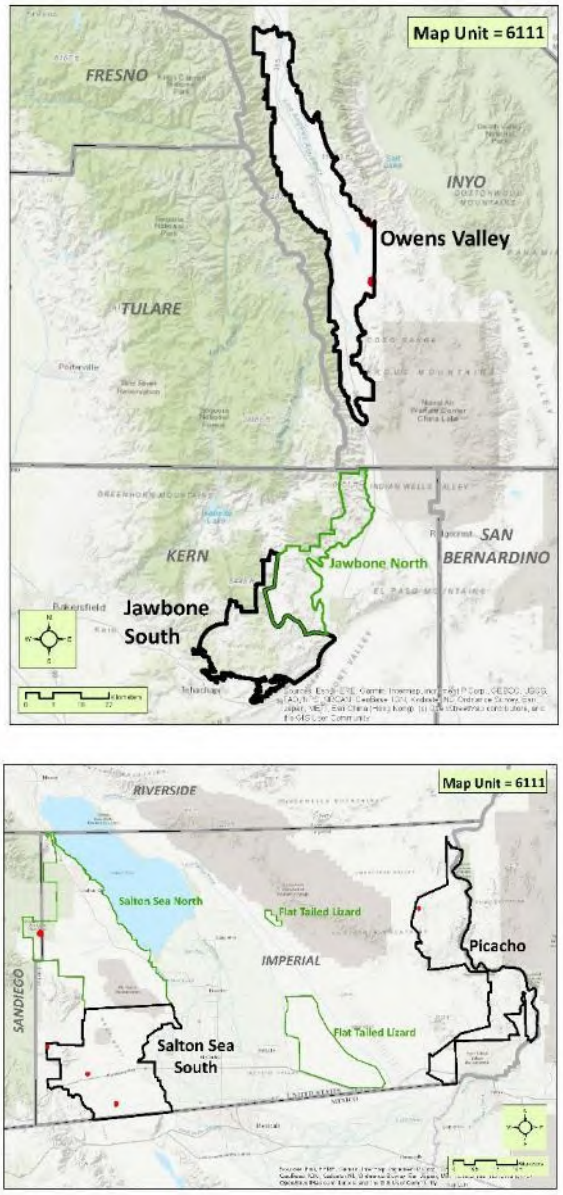
**DESCRIPTION:** *Atriplex hymenelytra* comprises more than 1 percent of the cover and no other woody species has equal or higher cover, except *Larrea tridentata*, which may co-dominate. This Alliance may occur on hot rocky slopes, dry bajadas, or alkaline badlands and playa edges. Stands are local in the extreme north of the mapped area near Ridgecrest and Trona on alkaline basin sediments, and are more extensive in the Calico and Alvord Mountains on volcanic ash and flows emanating from the southern and eastern sides of these ranges. Stands are also known from the altered volcanic hills southeast of Barstow, west of Daggett, in the eastern Owens Valley, and along the western Inyo Mountains. 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. Note that per CDFW low cover *Hoffmannseggia microphylla* in the Superstition Hills was mapped as this type rather than a sparsely vegetated rock type mapping unit.

**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:**

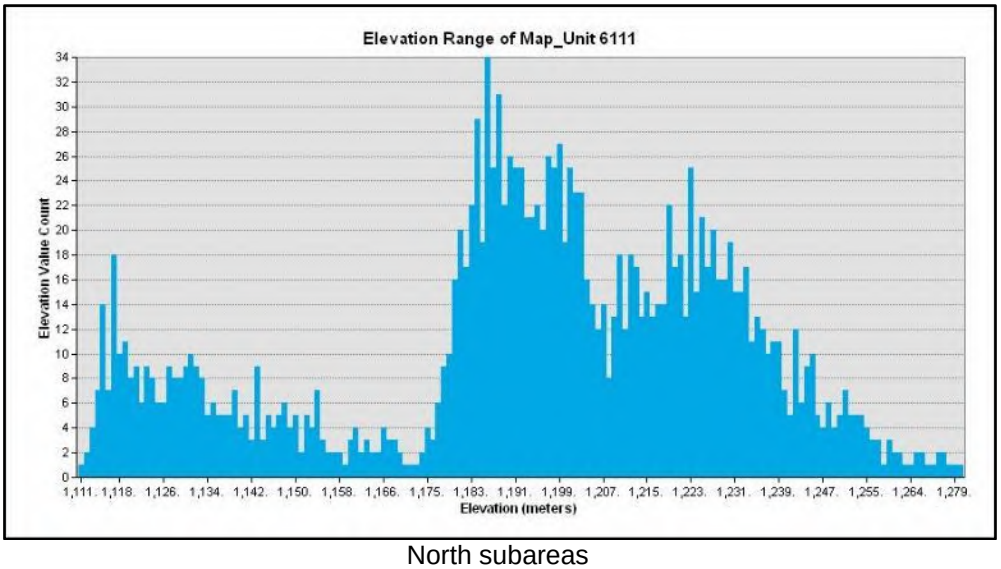
- *Ambrosia dumosa* (4111) – At times, a sparse cover of this species can occur on substrate similar to that of *A. hymenelytra,* making it difficult to discern the two species.
- *Chorizanthe rigida - Geraea canescens* Desert Pavement *S*parsely Vegetated Alliance (6117) – Stands mapped to this mapping 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, photointerpreters 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)**

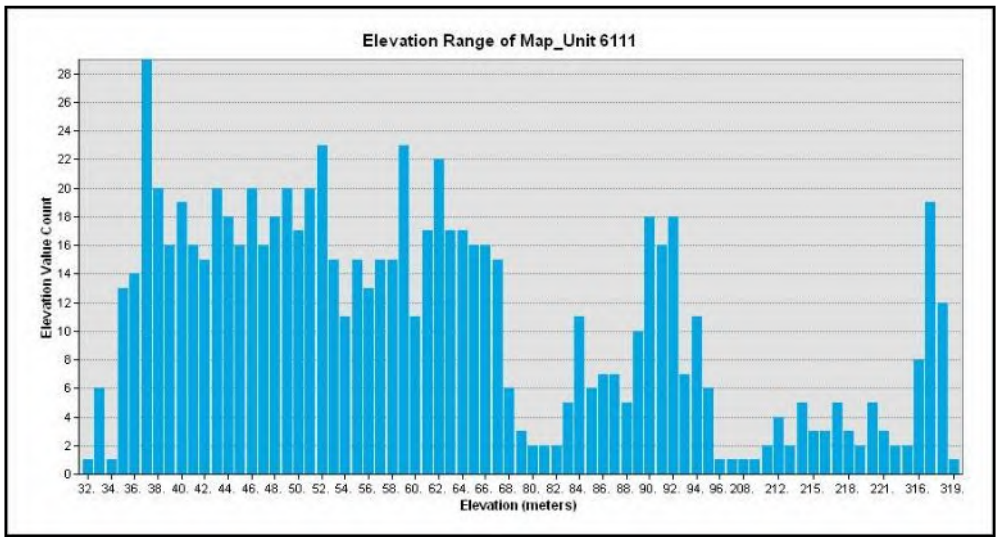



**DISTRIBUTION:** The *Atriplex hymenelytra* Alliance is mapped in the Northern, Central, and Eastern Mojave regions, in the Owens Valley, in the vicinity of Searles Lake, north and northeast of Barstow; and at a few sites in the Colorado Desert. In the current study area, *Atriplex hymenelytra* is mapped on a few upper fans and toes slopes on the east side of the Owens Valley subarea; at one site near the Ocotillo badlands and two sites in the Yuha Desert in the Salton Sea North and South subareas; and one polygon in the Chocolate Mountains of the Picacho subarea.

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




North subareas

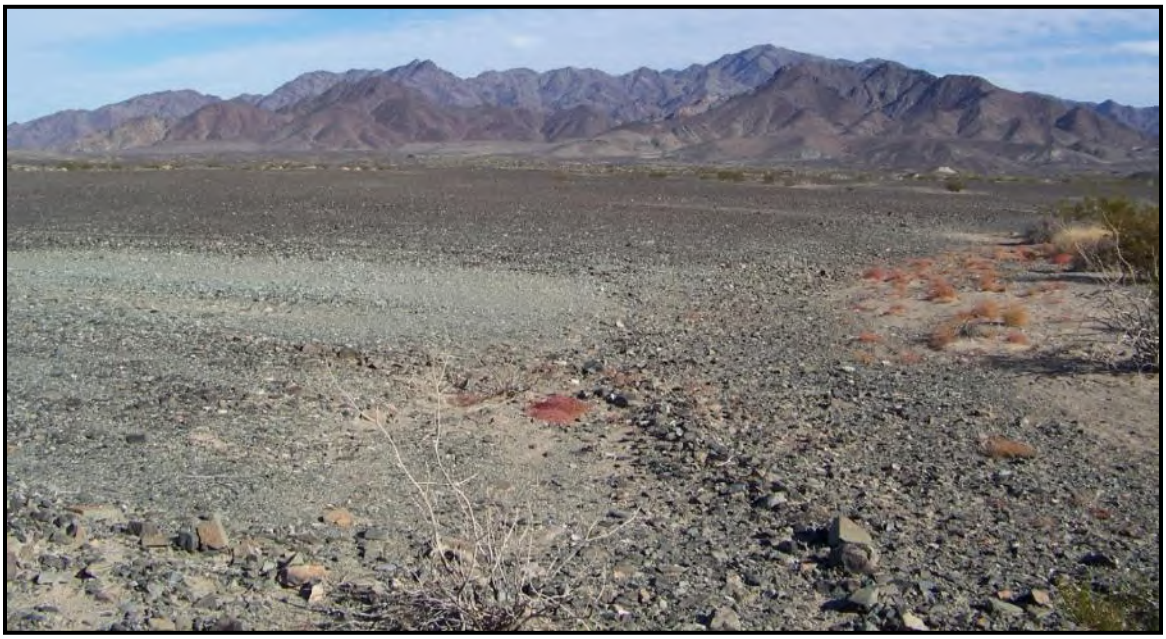



South subareas

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

Spiny herb – Desert gold Desert Pavement Sparsely Vegetated Alliance


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



Desert pavement surfaces 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. The best examples of this mapping unit are in the eastern part of the desert where these features are an extensive and diagnostic part of the Colorado Desert. Farther west, the rainfall average is higher and the quality and extent of this landform are less pronounced.

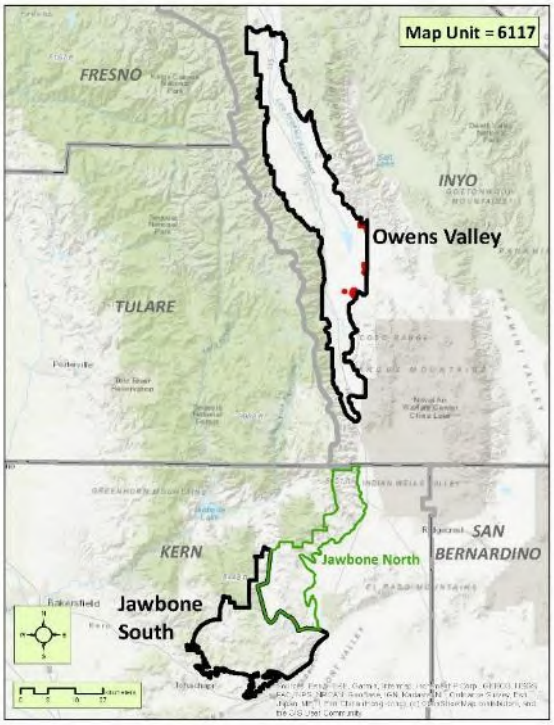
**PHOTOINTERPRETATION SIGNATURE:** This type is a sparsely vegetated landform, often dissected by narrow rills containing a sparse to rather dense cover of shrubs and at times a low-growing *Parkinsonia florida - Olneya tesota* (microphyll) wash component. Overall, vegetative cover is less than 2 to 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.

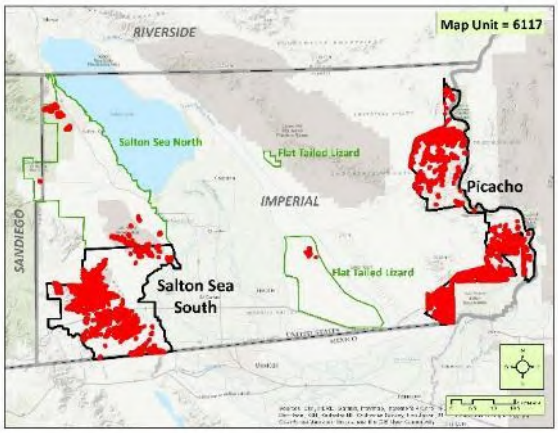
**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *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.
- *Parkinsonia florida - Olneya tesota* Alliance (4227) – This type is mapped on pavement areas where trees are present on the pavement surface, and/or where the tree-vegetated rills of the pavement area are evenly distributed (representative) across the pavement polygon. Total cover of the pavement polygon is above 2 to 4 percent.

- Sparsely vegetated playa (Ephemeral annuals) Mapping Unit (6116) – In certain settings, particularly around the eastern and southern edges of Ford Dry Lake, 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.

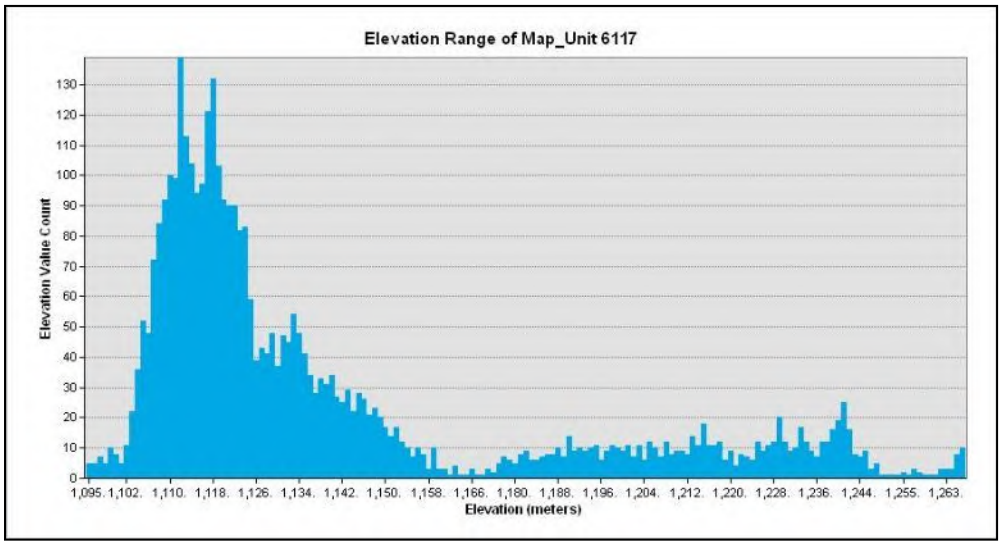
***Chorizanthe rigida - Geraea canescens* Desert Pavement Sparsely Vegetated Alliance (6117)**



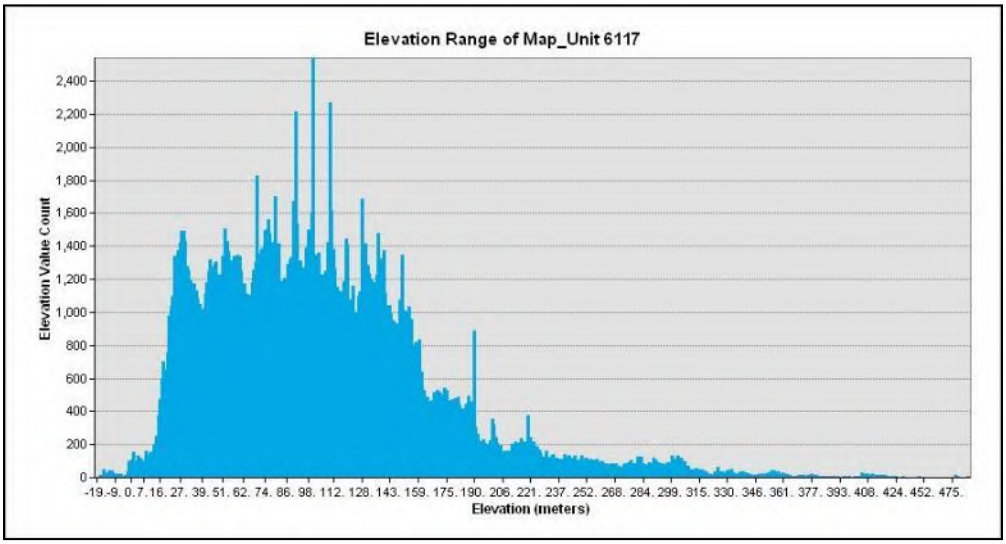




**DISTRIBUTION:** The *Chorizanthe rigida - Geraea canescens* Desert Pavement Sparsely Vegetated Alliance is very prevalent and extensive in the Colorado Desert on middle to upper bajadas flanking all the mountains in that region. In the Central Mojave Desert region, they are primarily mapped on bajadas nearby and adjacent to the Pinto Mountains, and at the base of the Calico and Alvord Mountains. In the Western Mojave Desert region, they are on bajadas adjacent to the El Paso Mountains. They are much less common in the Eastern Mojave Desert region and are absent in all but the northeastern corner of the Salton Sea Trough zone. In the current study area, this Alliance is mapped over many alluvial fans in the Salton Sea South subarea, and on several fans just west of Salton City, and south of the Superstition Hills, in the Salton City North subarea; and at a number of upper bajadas on the eastern side of the Owens Valley subarea up from Owens Lake. In the Picacho subarea, it is mapped at the Palo Verde Mountains, throughout the Chocolate Mountains, and on the bajadas below the Chocolate Mountains and the Cargo Muchacho Mountains northwest of Yuma.

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




North subareas

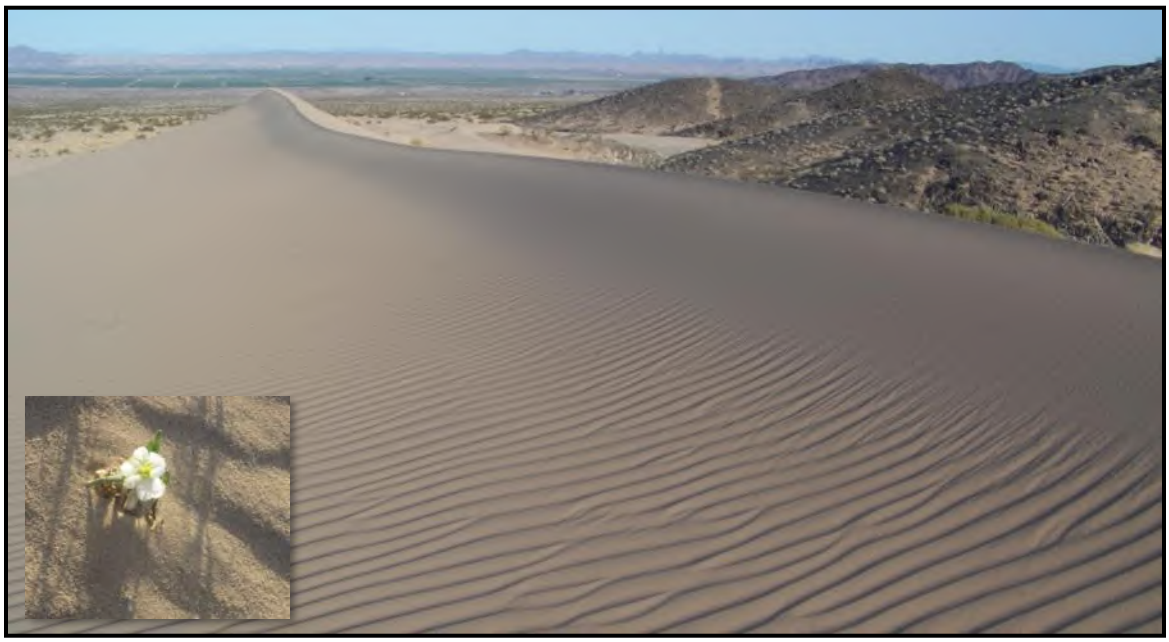



South subareas

## *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Alliance (6121)

Desert dunes Alliance

This is an example of a very sparsely vegetated *Dicoria canescens - Abronia villosa – Panicum urvilleanum* Alliance desert dune. Note the east-west linear dune pattern.



The dunes depicted on this photo represent the eastern edge of the Rice Valley Sand Dunes. The *Oenothera deltoides* (dune primrose) pictured in the inset may be encountered in this environment.

***Dicoria canescens – Abronia villosa – Panicum urvilleanum* Alliance (6121)**

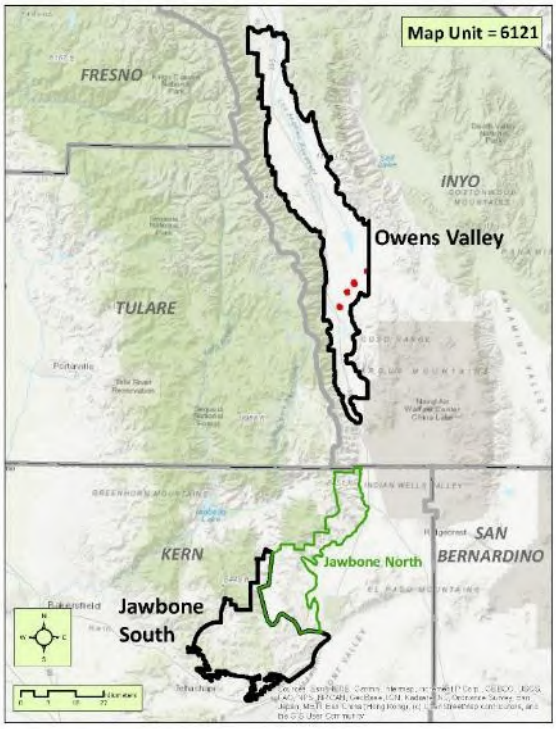
**DESCRIPTION:** *Dicoria canescens* or *Abronia villosa* are characteristically present in stands, but are not necessarily dominants, depending upon the year and the phenology of these annual plants. Skeletons of *Dicoria, Oenothera deltoides, Abronia villosa* and other psammophytic annuals are usually present and uniform woody plant cover is less than 2 percent 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. Note that this alliance also includes dune area stands characterized by *Panicum urvilleanum, Salsola tragus,* and those dominated by *Wislizeni refracta*.

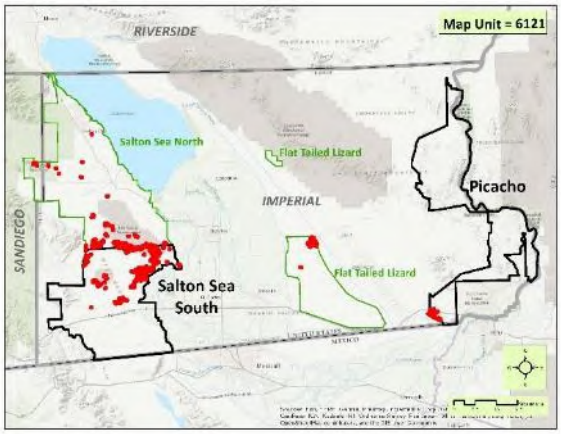
**PHOTOINTERPRETATION SIGNATURE:** Photo signature shows little or no vegetation on a substrate composed primarily of white to tan sands. Crescent or wavy linear patterns of dunes are visible, sometimes with a gray tone. Sparse vegetation may assemble in the interdunal spaces or may be scattered throughout the stand in cover below 2 percent when occurring on sand sheets.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Atriplex canescens* Alliance (5111) – Stands have greater than 2 percent cover of vegetation. The shrub signature most commonly appears brown to tan, less commonly gray to grayish blue.
- *Ephedra californica – Ephedra trifurca* Alliance (4211) – The *E. trifurca* version of this type occurs on sand dune areas. The stands are vegetated at greater than 2 percent cover. They appear as large gray to green individuals with a dense crown and well-defined edges, and grow in evenly-spaced and/or clonal ring patterns.
- North American warm desert dunes and sand flats Group (6120) – This is the default type for sparsely vegetated sand dunes and sand flats that do not appear to have any vertical relief or contain vegetation that may not be as diagnostic as that which may occur on a classic dune.

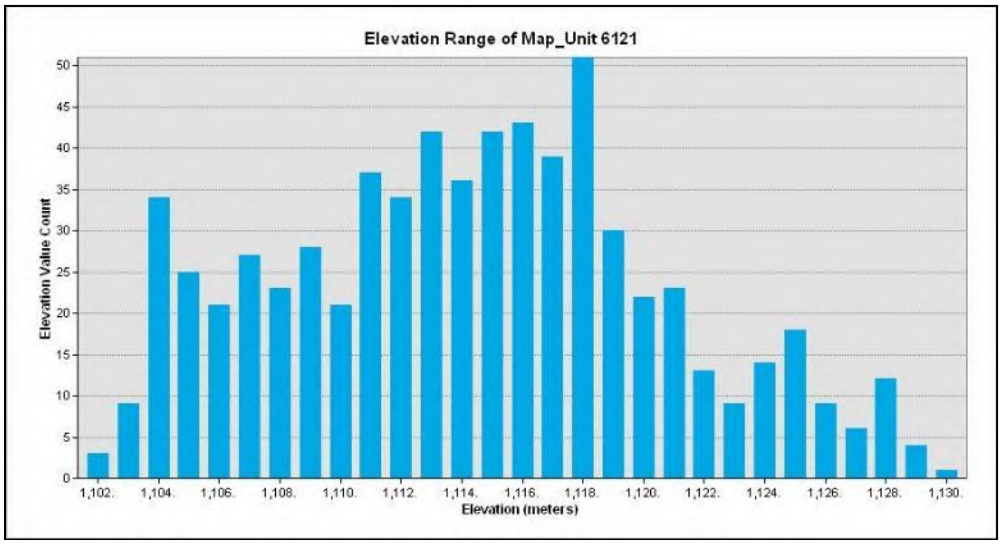
***Dicoria canescens – Abronia villosa Panicum urvilleanum* Alliance (6121)**



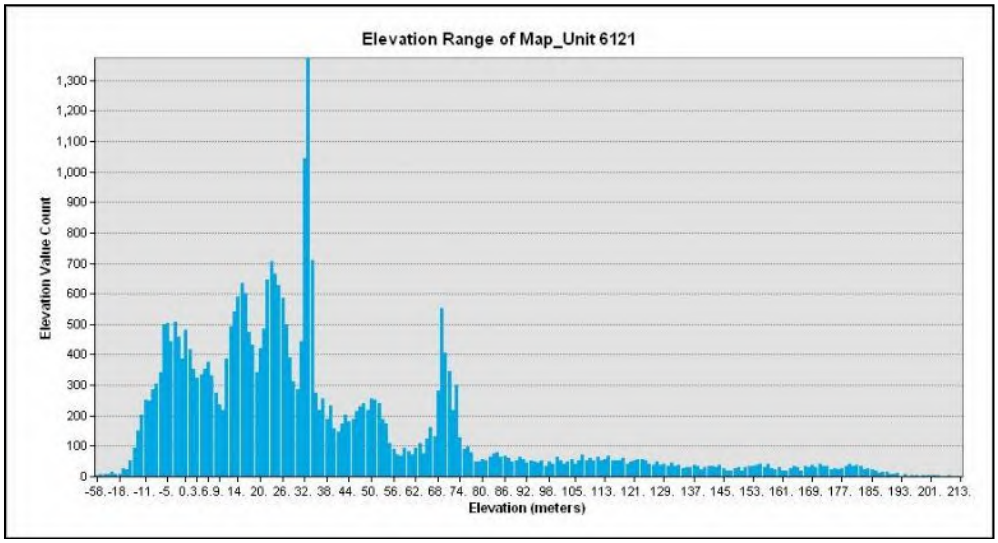




**DISTRIBUTION:** Stands of *Dicoria canescens - Abronia villosa – Panicum urvilleanum* Alliance occur in the Colorado Desert Region all along the Chuckwalla Valley from Palen Dry Lake and just south of the Coxcomb Mountains to just east of Wileys Well Road. A few isolated stands also occur on the eastern edge of Palo Verde Mesa. They area also found at the Dumont Dunes area in the Eastern Mojave Subregion. In the current subarea, this Alliance is mapped mainly on West Mesa south of the Superstition Hills, and is isolated sites south of Salton City, both in the Salton Sea North and South subarea; in the Imperial Dunes at the north end of the Flat-Tailed Horned Lizard subarea; on Pilot Knob Mesa mostly south of Interstate 8 in the Picacho subarea; and on several sites on the lower bajada southeast of Owens Lake in the Owens Valley subarea.

***Dicoria canescens – Abronia villosa – Panicum urvilleanum* Alliance (6121)**




North subareas




South subareas

## Massive sparsely vegetated rock outcrop Mapping Unit (6115)


The above image depicts a sparsely vegetated Mesozoic granitic outcrop. Vegetative cover is below 2 percent, a vivid contrast with the nearly 15 percent cover of *Larrea tridentata* to the southeast.

This photo depicts a steep south-facing slope composed of gravels, cobbles and boulders. Vegetative cover is extremely low on numerous slopes in this range with cover here averaging well below 2 percent.

**Massive sparsely vegetated rock outcrop Mapping Unit (6115)**

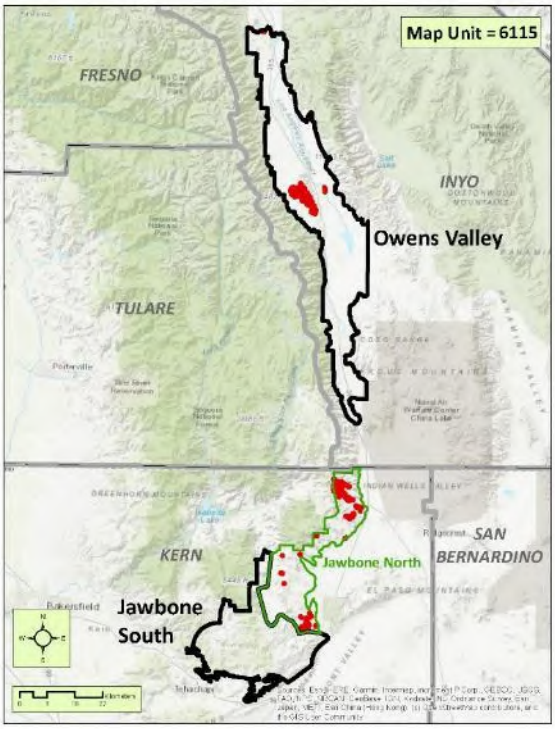
**DESCRIPTION:** This mapping unit is defined by extensive solid blocks of resistant rock of any type. In the study area these may be volcanic extrusives such as basalt or rhyolite; igneous intrusives such as granodiorite, gabbro, or quartz monzonite; or sedimentary sandstones or limestones, etc. Large unfractured bedrock or boulders are typical, with narrow crevices in different densities. Overall shrub and herb cover tends to be under 2-3 percent, making it difficult to distinguish any particularly dominant species. Mapping units of this type may include small (less than 10 acres) stands of *Ephedra viridis, Atriplex polycarpa, Encelia farinosa, Ericameria cuneatus, Ericameria teretifolia, Salazaria mexicana, Eriogonum fasciculatum, Atriplex hymenelytra, Peucephyllum schottii,* and other Alliances with extremely low cover. This mapping unit is differentiated from Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113) by erosional patterns. Individual rock outcrops, boulders, etc. will be seen in this unit but not in the Mud Hills type.

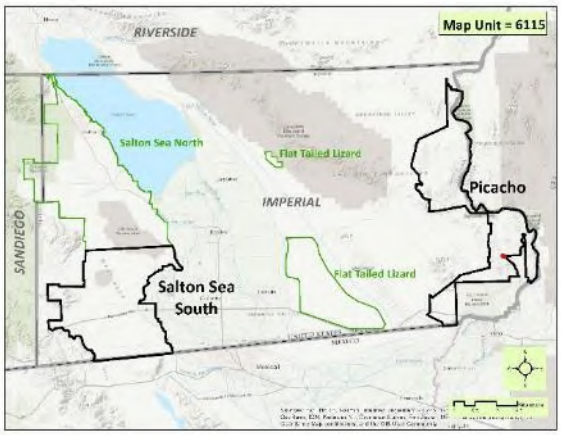
**PHOTOINTERPRETATION SIGNATURE:** Signature is variable depending on the base rock type. Color can be white, gray, brownish tan, reddish tan, or dark gray to black. Vegetative cover is very sparse. Throughout much of the desert mountain ranges, isolated areas containing less than 2 percent cover fall into this category but are often below the MMU. The signature usually shows extensive rough hard-surface terrain. Highly dissected badland features generally contain over 2 percent vegetative cover or fall into the sparsely vegetated Mud Hills Mapping Unit.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Atriplex hymenelytra* Alliance (6111) – This sparsely vegetated Alliance is generally mapped on pavement surfaces, basalts, or on the Mud Hills sparsely vegetated ephemeral herbs Mapping Unit. When occurring on light-colored rock of any substrate, the sparse cover is generally not discernible even on high-resolution imagery.
- *Encelia farinosa* Alliance (4114) – This type has greater than 2 percent cover of light gray individual shrubs on dark volcanic rock.
- Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113) – Topography is typically complex, extensively eroded in nature, with smooth-textured interfluves. Terrain does not have a massive, broken-up, or rough-surface character.
- North American warm desert bedrock cliff and outcrop Group (6110) – Sparsely vegetated terrain features are mapped to the Group level when massive bedrock outcroppings are not discernable on the imagery over areas greater than 10 acres in size.

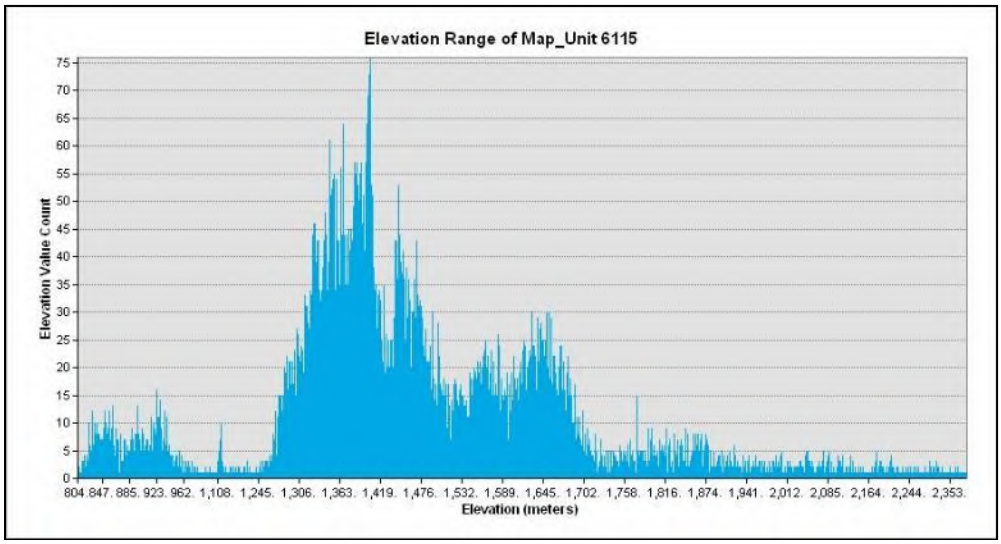
**Massive sparsely vegetated rock outcrop Mapping Unit (6115)**



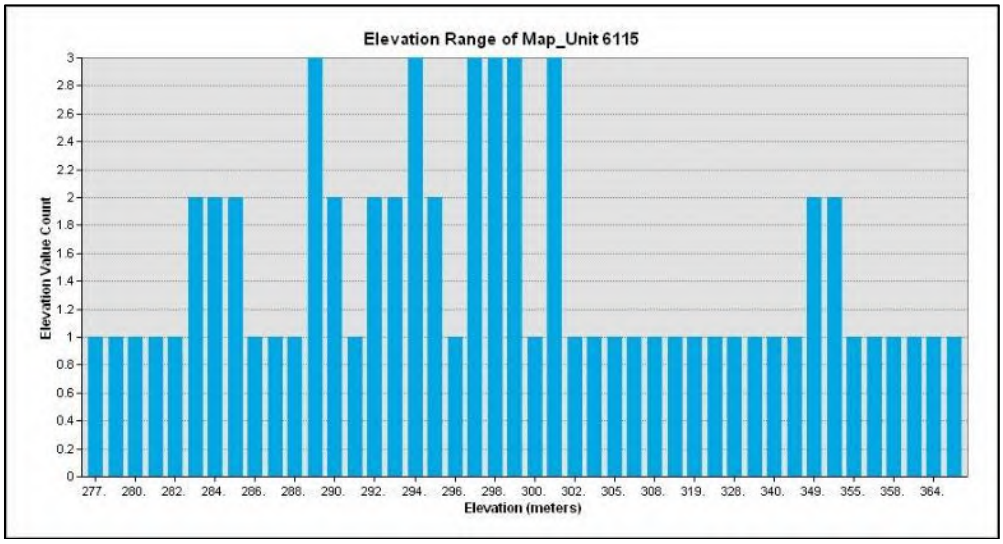




**DISTRIBUTION:** This sparsely vegetated type occurs on bedrock over widely scattered areas of both the Mojave and Colorado Desert. However, the majority of occurrences of these features are below the 10 acre MMU, which therefore are not mapped. In the current study area, this Mapping Unit is mapped along the desert foothills of the southern Sierra Nevada in the Jawbone North and South subarea, especially in the vicinity of Indian Wells, Short, and Grapevine Canyons; concentrated in the western side of the Alabama Hills and the along the Owens River east of the Alabama Hills, in the Owens Valley subarea; and one polygon was mapped in the Chocolate Mountains in the Picacho subarea.

**Massive sparsely vegetated rock outcrop Mapping Unit (6115)**



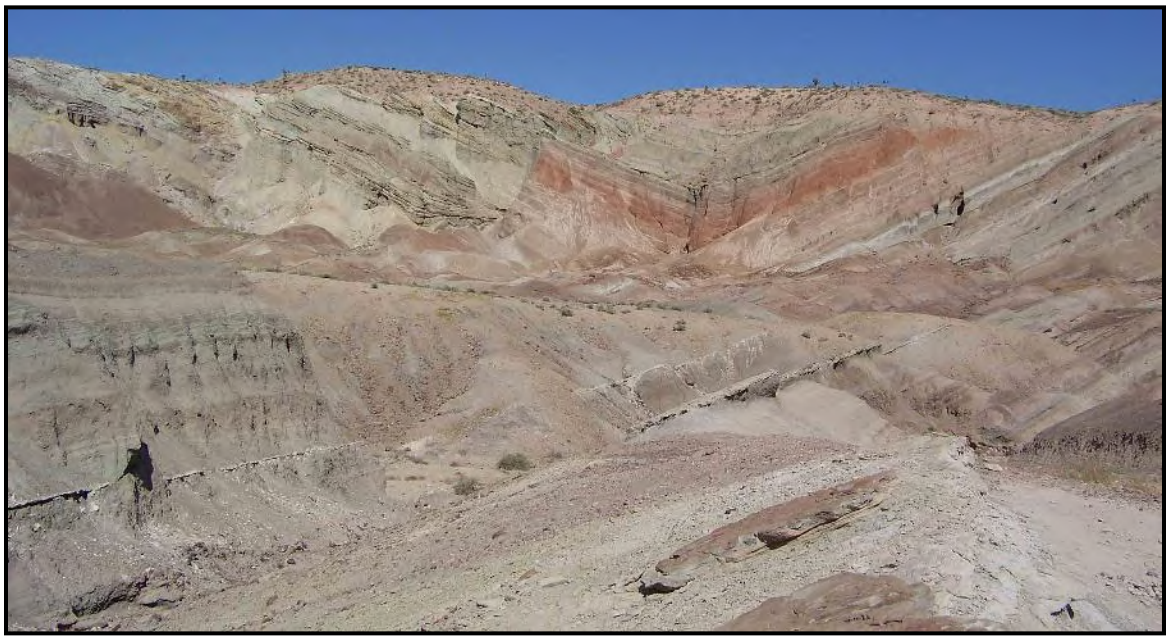

North subareas




South subareas

## Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113)

This image in the Mud Hills area shows the mottled white to tan color of extensively eroded badlands with smooth interfluves that characterizes the Mud Hills sparsely vegetated ephemeral herbs Mapping Unit. Note: this screenshot is a portion of a larger polygon whose boundaries are not shown.



This ground photo shows very sparse vegetation over the folded and distorted alkaline rocky substrate at the Rainbow Basin Natural Area in the Mud Hills northwest of Barstow.

**Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113)**

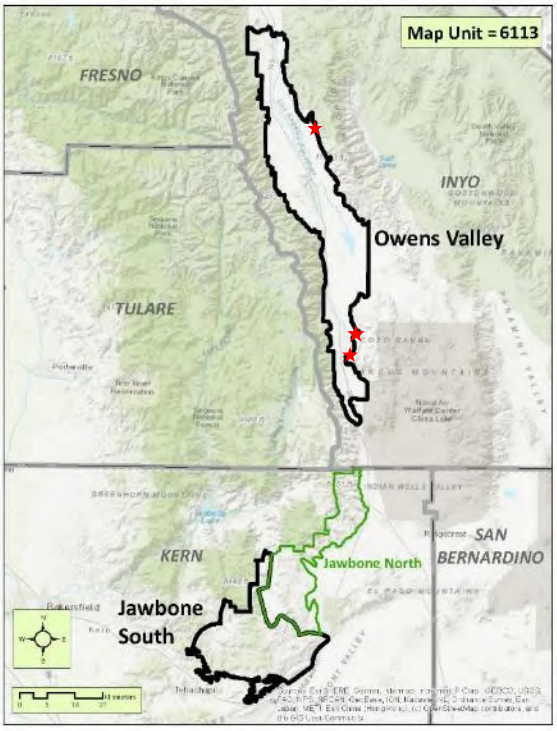
**DESCRIPTION:** This mapping unit is usually sparsely vegetated with less than 2 percent shrub or herb cover. Substrate is composed of unconsolidated and uncemented fine, sometimes alkaline, sediments. These substrate variations result in highly diverse but typically sparsely vegetated slopes. The landscape 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"). 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.

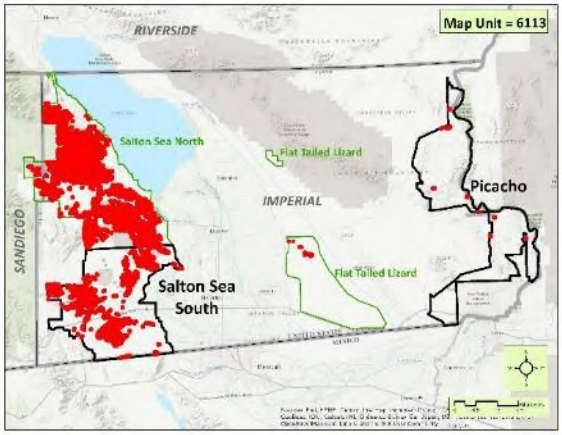
**PHOTOINTERPRETATION SIGNATURE:** The photo signature shows very little to no vegetation. Typically, this mapping unit occurs on badland topography or eroded hills with an unpredictable mosaic of white, tan, pink, and gray colors, and a smooth texture in the interfluves.

**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.
- 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.

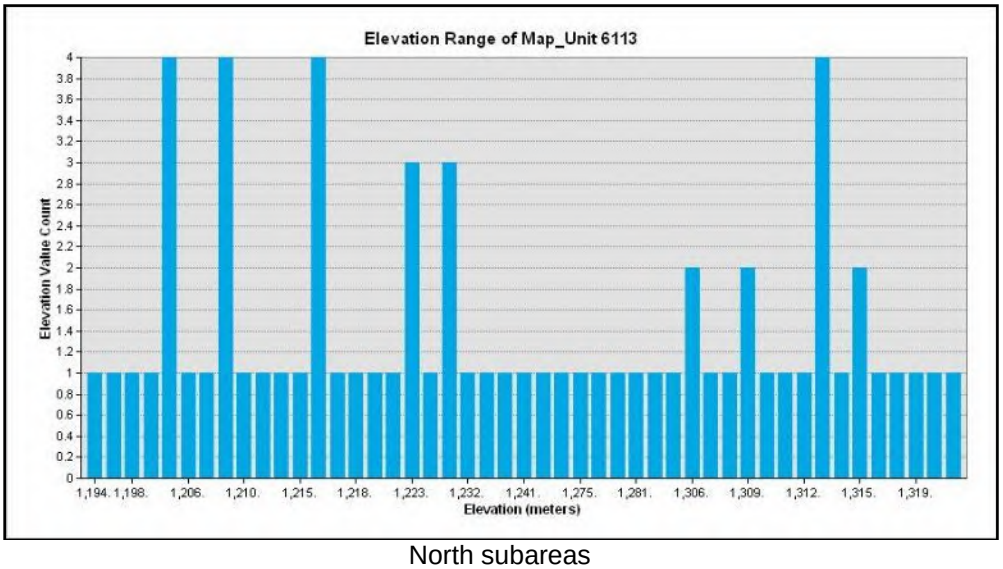
**Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113)**



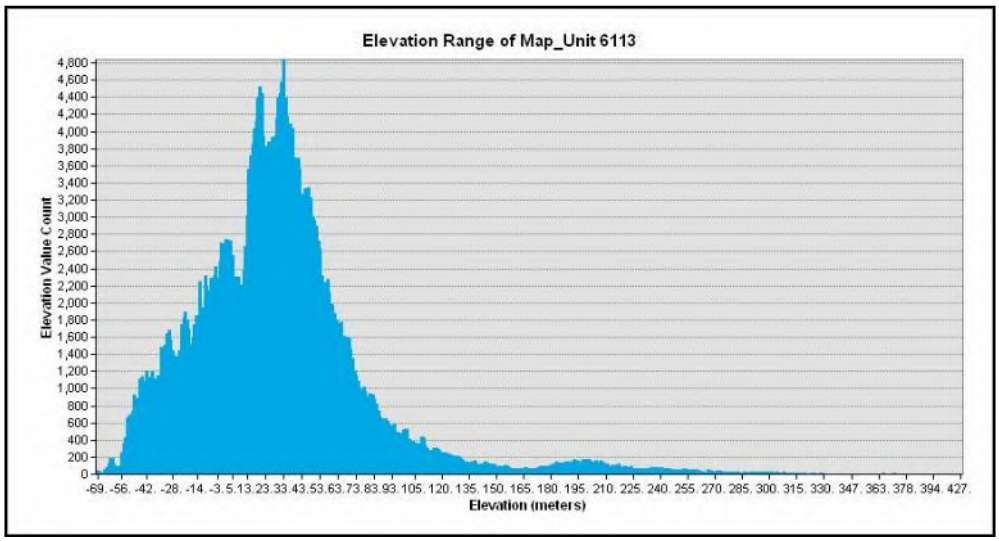




**DISTRIBUTION:** The Mud Hills sparsely vegetated ephemeral herbs Mapping Unit is concentrated in the northern part of the DRECP area, in the Western Mojave and Central Mojave regions. It has also been noted further south in the Colorado Desert, in isolated foothill regions of the Chocolate Mountains, and on the east and west side of the Salton Sea. In the current study area, the Mud Hills Mapping Unit is mapped throughout the Salton Sea North and South subareas; at several sites in the northern part of the Flat-Tailed Horned Lizard subarea; at several sites in the Palo Verde and Chocolate Mountains of the Picacho subarea; and at three locations in the Owens Valley subarea (represented as stars), at the toe of the Inyo Mountains below Bee Springs Canyon, and two sites in the hills just east of Haiwee Reservoir.

**Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113)**




North subareas




South subareas

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

The image shows areas of sparsely vegetated rocky slopes with minimal amounts of unconsolidated surfaces in the Cargo Muchacho Mountains. Note: This screenshot is a portion of a larger polygon whose boundaries are not shown.

The photo shows rocky outcroppings interfacing with small areas of some soil development in the Cargo Muchacho Mountains.

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

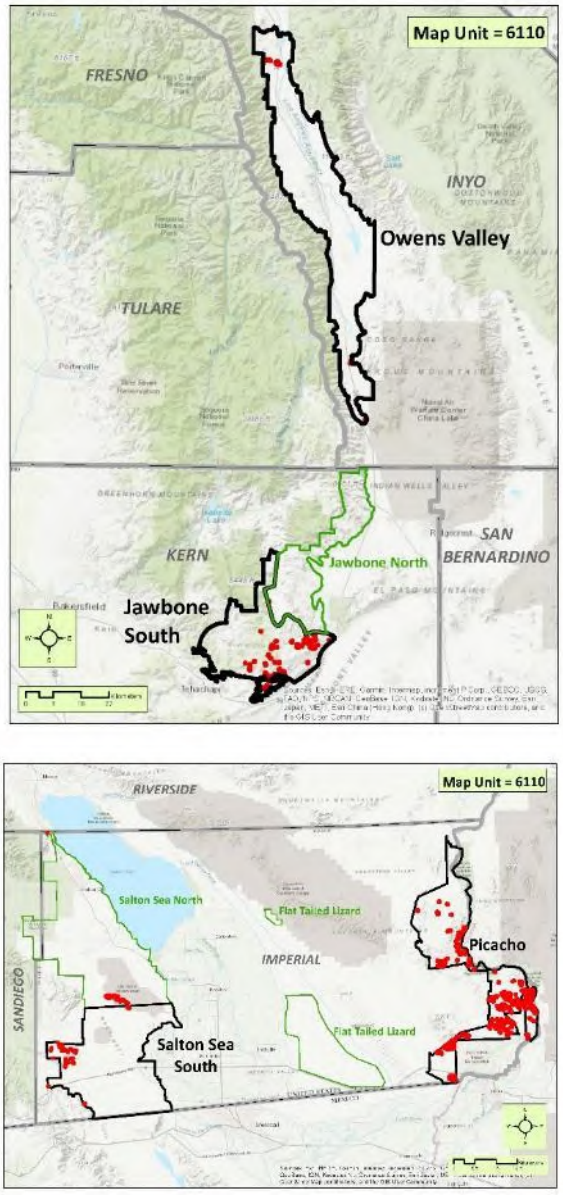
**DESCRIPTION:** This is a Group-level category consisting of rock outcroppings, sparsely vegetated Alliances (*Ephedra funerea, Atriplex hymenelytra,* etc.*),* alkaline lacustrine derived hills (mud hills), pavement surfaces with diagnostic plants, playas, washes and riverine flats, and complexes of 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 or finer levels 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. Image signature plays a minor role based on floristic dominance.

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

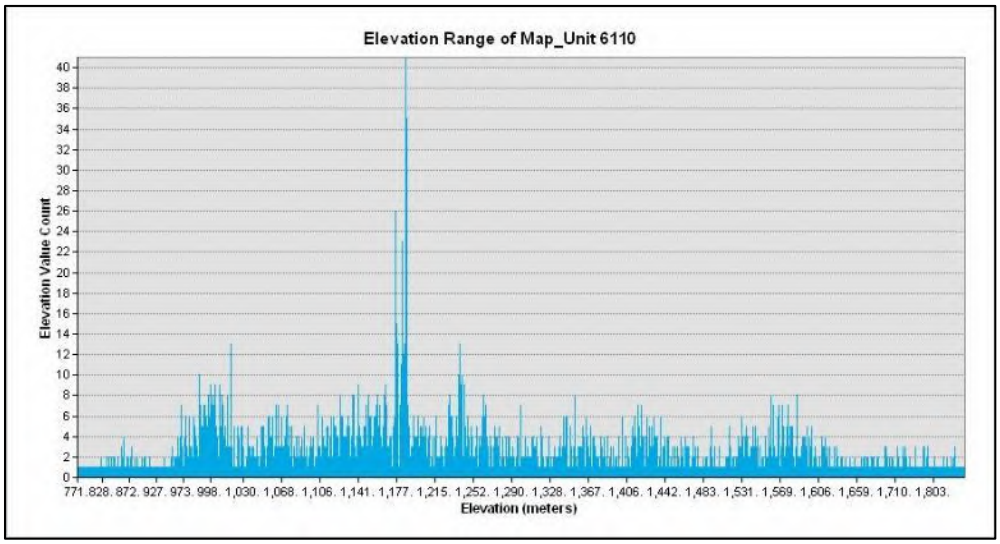
- Low cover floristically defined stands of vegetation where the substrate is the primary signature on the imagery.

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

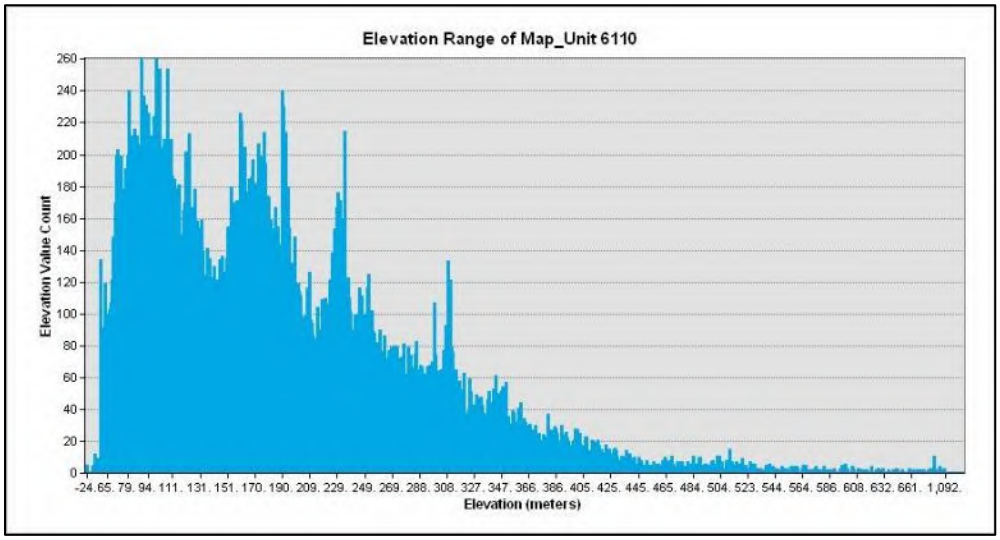



**DISTRIBUTION:** Group-level designations are mapped primarily where photointerpreters cannot determine whether mountainous surfaces are massive enough (containing little or no unconsolidated material) to make a reliable decision to a finer level. Stands are infrequent in most regions of the mapping area and are concentrated for the most part in steep, rocky terrain. In the current study area, this Group is mapped throughout the Chocolate Mountains of the Picacho subarea; on Superstition Mountain and in the Coyote Mountains of the Salton Sea North and South subareas; at higher elevation sites and the desert foothills of the southern Sierra Nevada in the Jawbone South subarea; and on a few lava flow sites in the Owens Valley subarea.

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




North subareas




South subareas

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


Located at the base of Cave Mountain, the image shows the typical white signature of a sandy flat (in 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)**

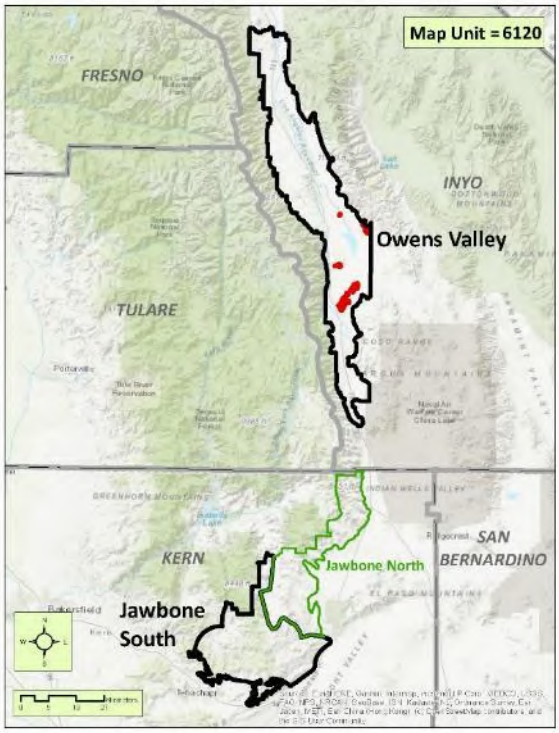
**DESCRIPTION:** This category was used for sparsely vegetated to unvegetated open sand dunes, sand aprons, and sandy flats. The vegetation is generally sparse to very open (at least 2 to 20 percent cover) except for annual blooms in favorable years. The vegetation type was assigned to the Group level 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 sandsheets and dune complexes are mapped to the *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Alliance.

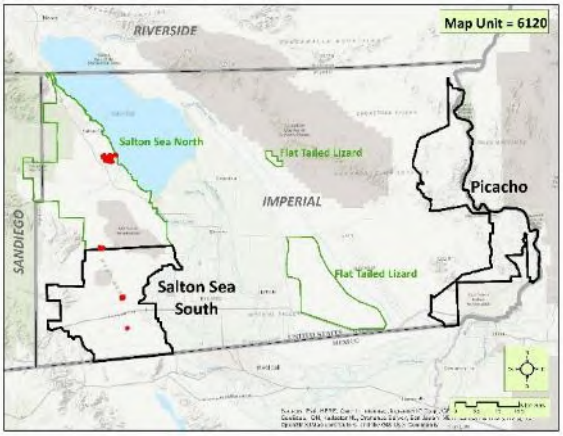
**PHOTOINTERPRETATION SIGNATURE:** Sandy areas typically have a white to light tan or light gray signature. Dunes tend to have a hummocky appearance whose topography is highlighted by vegetative edges in low relief areas or by shadows. Specific dune Alliances within this Group are mapped from field data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

**TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:**

- *Atriplex canescens* Alliance (5111) – Stands have greater than 2 percent cover of vegetation. The shrub signature most commonly appears brown to tan, less commonly gray to grayish blue. Stands dominated by this species of *Atriplex* are commonly found on dunes, especially in areas close to larger playas.
- *Dicoria canescens - Abronia villosa – Panicum urvilleanum* Alliance (6121) – This type was mapped in the Colorado Desert portion of the study area from field survey data and locally extrapolated. Where field data does not exist, stands are mapped only on larger dune complexes, such as the Dumont Dunes in the Eastern Mojave subregion.
- *Ephedra californica – Ephedra trifurca* Alliance (4211) – The *E. trifurca* version of this type occurs on sand dune areas. The stands are vegetated at greater than 2 percent cover. They appear as large gray to green individuals with a dense crown, well-defined edges, and grow in evenly-spaced and/or clonal ring patterns.
- *Pleuraphis rigida* Alliance (4122) – Stands have greater than 2 percent cover of vegetation. This bunch grass has a mottled, light gray signature, with cover ranging widely within a stand.
- Sparsely vegetated playa (Ephemeral annuals) Mapping Unit (6116) – The similarities between these two land features are addressed in the sparsely vegetated playa section of this report.
- 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.

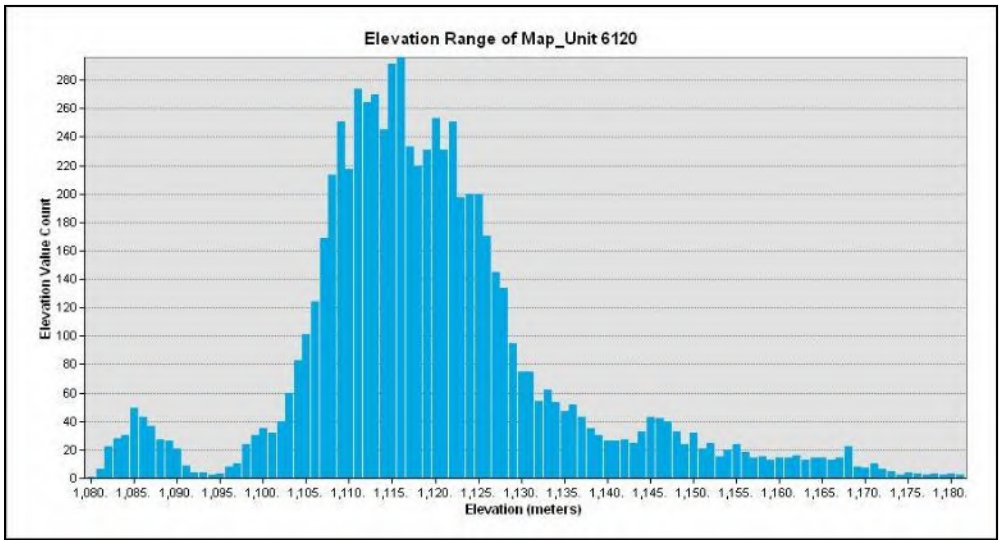
**North American warm desert dunes and sand flats Group (6120)**



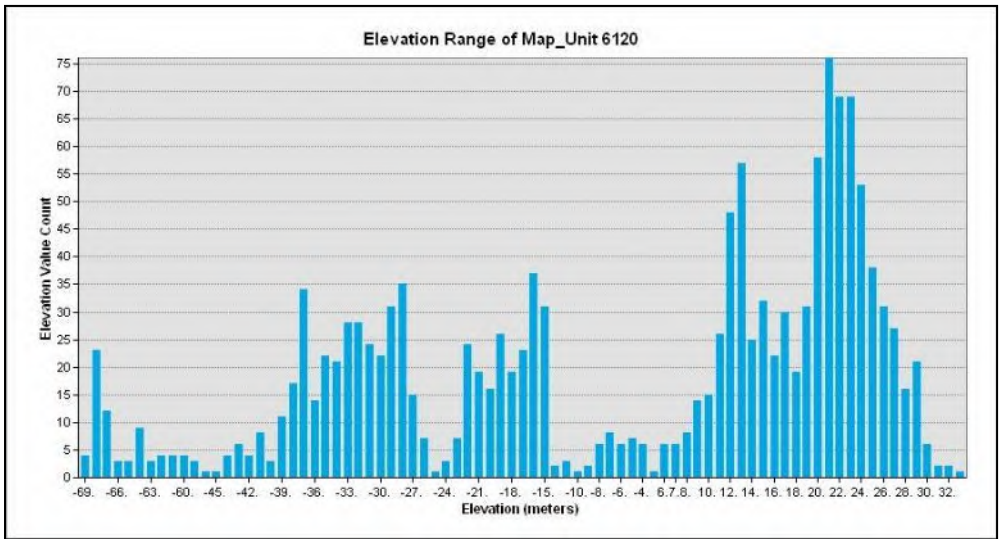




**DISTRIBUTION:** This Group-level, composed of sand dunes, sand aprons, and sand flats, is found in the Central Mojave Region, mainly from the Barstow area to Mesquite Lake, and in the Lower Johnson Valley area. It is also found in several locations in the Colorado Desert, including the Salton Sea area and rarely by the Colorado River. In the current study area, this Group is mapped at three locations in the Salton Sea North and South subareas, one on the west edge of the Salton Sea, and two on West Mesa southwest of Superstition Mountain, and next to Coyote Creek. Several sites are mapped around Owens Lake in the Owens Valley subarea.

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




North subareas




South subareas

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

This image shows a playa almost totally devoid of shrubs surrounded by a patchwork of scalds.

A sparsely vegetated playa is seen here with its lack of shrubs and grasses on a dry, cracked alkaline substrate.

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

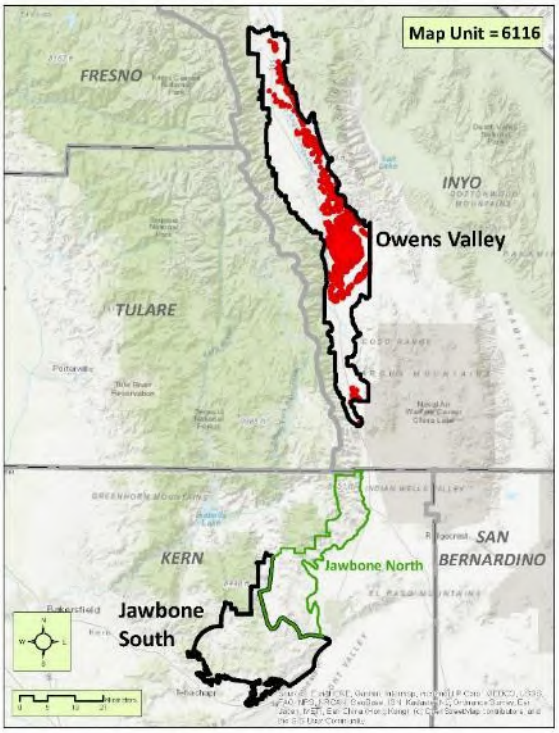
**DESCRIPTION:** This mapping unit defines silty, clay, or salt crust playa (dry lake) surfaces throughout DRECP region. Characteristics include moderate to highly reflective cracked substrate with no obvious slope. Most of the time playas, whether they are salty, silty, or clay, have less than 2 percent vegetative cover. However, annuals such as *Monolepis nuttalliana, Atriplex elegans, A. phyllostegia, Chenopodium spp.*, and others may occur in relatively high cover during good El Niño years. Even with this temporal growth, these sites are still identified as playas. Note that some sites on Owens Lake were considered to be and mapped as Restoration Areas (9400).

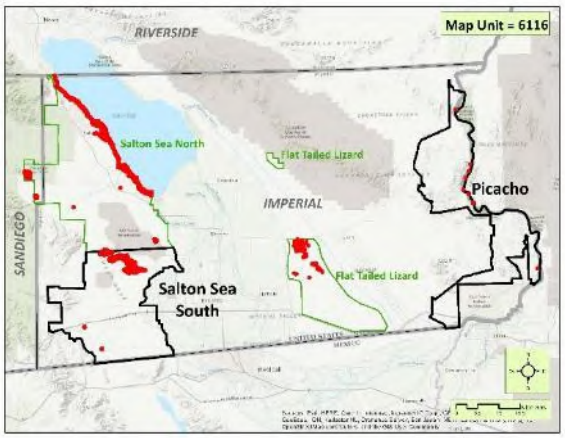
**PHOTOINTERPRETATION SIGNATURE:** Areas are mostly devoid of shrubs and herbaceous plants, reflecting a gray to white to tan color depending on alkalinity and moisture content of the soil. They occur in the lowest portions of watersheds and drainages. Shrubs can occur in isolated low-gradient rills 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.
- 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.
- North American warm desert dunes and sand flats Group (6120) – In several locations, most noteworthy in the Dumont Dunes, 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.

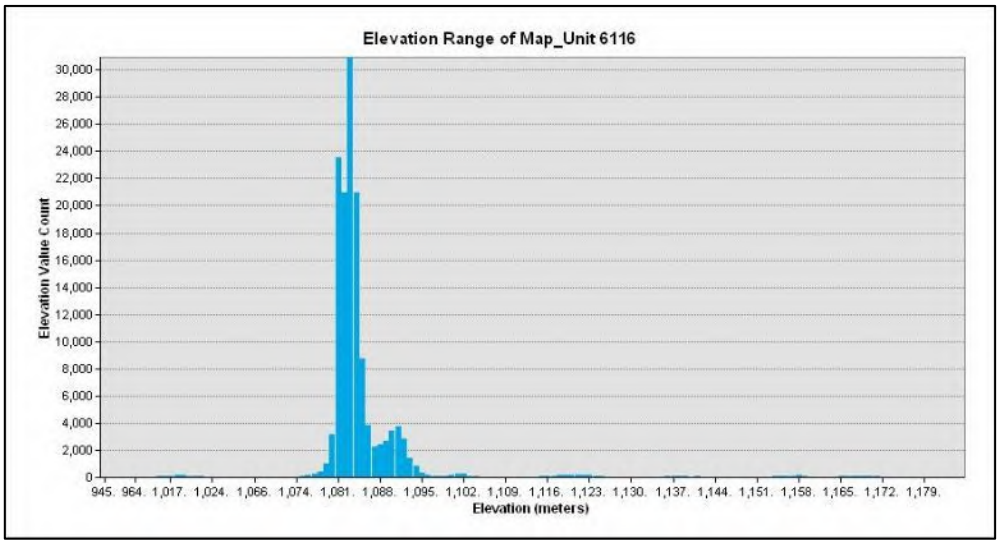
**Sparsely vegetated playa (Ephemeral annuals) Mapping Unit (6116)**



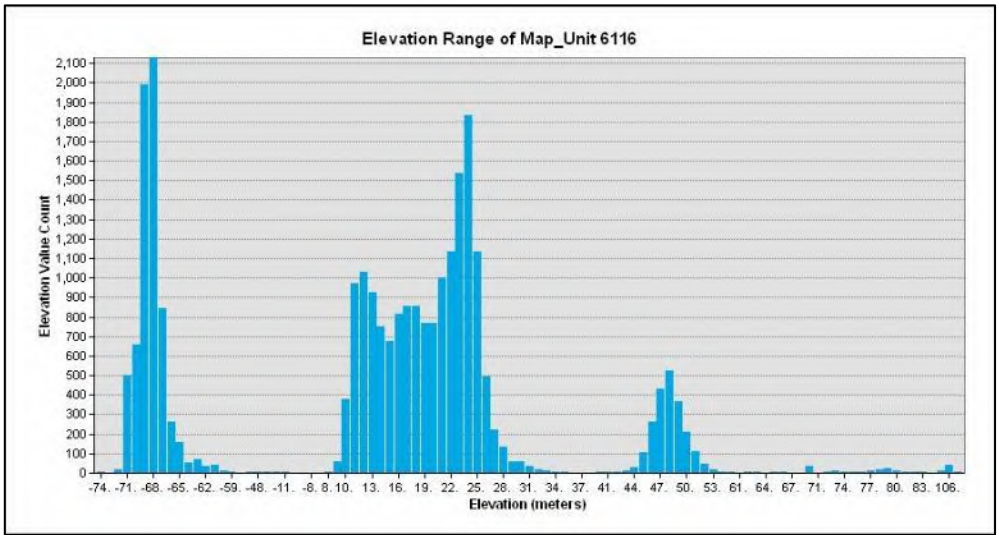




**DISTRIBUTION:** The Sparsely vegetated playa (Ephemeral annuals) Mapping Unit is found in every region of the DRECP. This type is comprised of larger endorheic basins such as Rogers and Palen Dry Lakes as well as smaller alkali sink complexes that occur southeast of Kramer Junction. Playa surfaces are common and vary considerably in size. In the current study area, this Alliance is mapped all along the western edge of the Salton Sea, in the Lower Borrego Valley, and on West Mesa in the Salton Sea North and South subareas; in the dune area north of East Mesa in the Flat-Tailed Horned Lizard subarea; several sites along the edge of the Colorado River floodplain in the Picacho subarea; and all along the Owens River floodplain, the Tulare Swamp area, within and on the edge of Owens Lake, and low areas in the Rose Valley, all within the Owens Valley subarea.

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




North subareas




South subareas

## Unvegetated wash and river bottom Mapping Unit (6114)


This mainly unvegetated sandy portion of the Mojave River bottom is flanked by stands of *Tamarix* spp.

This photo depicts an unvegetated section of the Mojave River looking upstream. Recent or frequent flooding generally hinders the development of woody and perennial vegetative growth.

**Unvegetated wash and river bottom Mapping Unit (6114)**

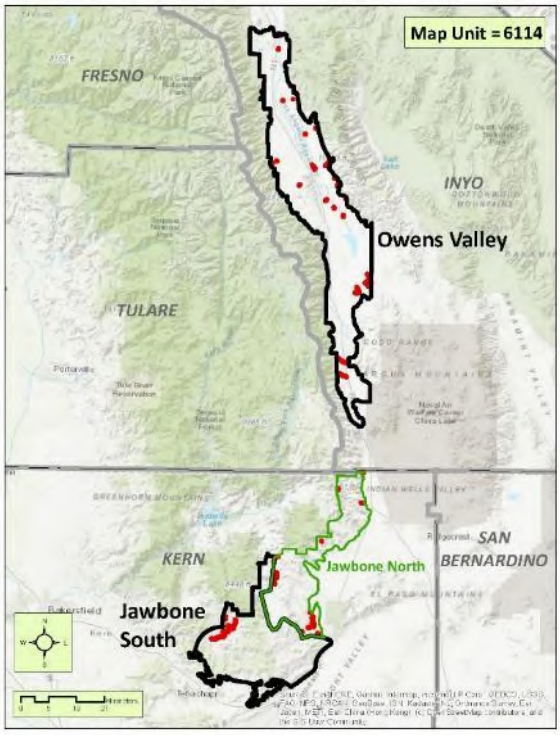
**DESCRIPTION:** This mapping unit is distinguished by largely unvegetated sands and gravels in the active centers of washes throughout the study area. Recent or frequent flooding generally hinders the development of woody and perennial vegetative growth. Due to varying flooding frequencies and intensities, "river-wash" channels can change rapidly and regularly, alternating from unvegetated to being vegetated by annual natives and then back to unvegetated. Unvegetated to sparsely vegetated dry remnant oxbows of the Owens River in Owens Valley were also included. Photointerpreters map to this category when scattered shrubs and herbs are inconsistent in the stand and make up less than 2 percent average cover. *Eriogonum desertorum* may be found in this mapping unit.

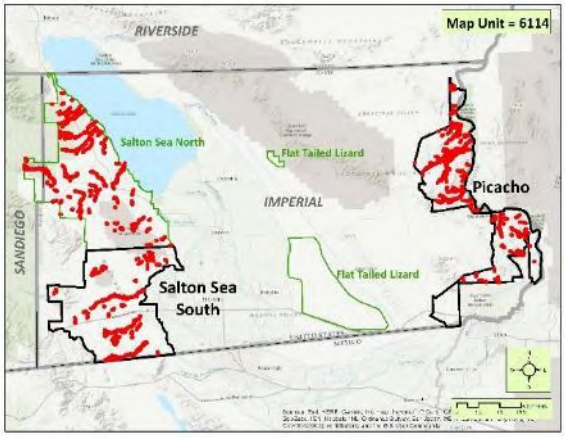
**PHOTOINTERPRETATION SIGNATURE:** Signature variability within unvegetated and sparsely vegetated washes is determined primarily by the intensity and frequency of fluvial events and by the geology of the parent substrate upstream. The signature is light, with the color ranging from white to tan, and 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. Photointerpreters 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.

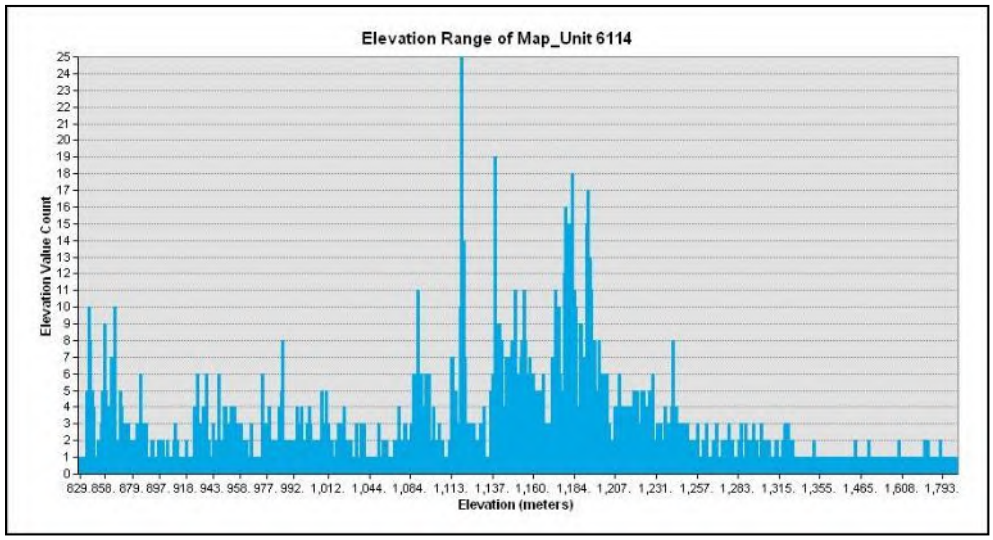
**Unvegetated wash and river bottom Mapping Unit (6114)**



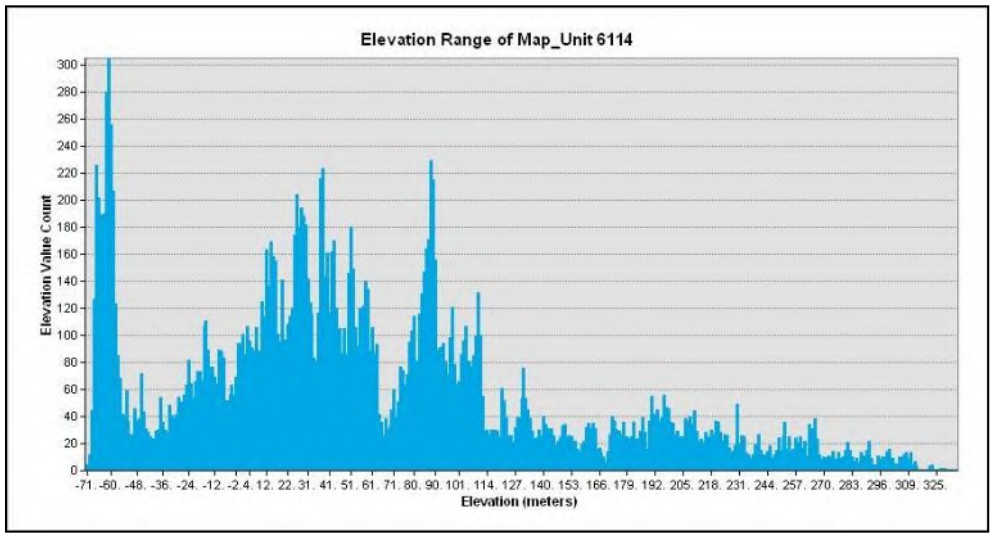




**DISTRIBUTION:** Mappable features within this type are found scattered throughout the DRECP area, especially at the base of mountains and on upper elevation fans/bajadas. Unvegetated wash and river bottom features are significantly smaller in the Colorado Desert, and are often too narrow to map. Larger wash systems in this region are generally vegetated by a significant cover of *Parkinsonia florida* and *Olneya tesota*. In the current study area, this Mapping Unit is mapped along many drainages in the Salton Sea North and South subarea, as well as the Picacho subarea. In the southern Sierra Nevada, it is mapped in the Jawbone South subarea along Caliente and Weaver Creeks, as well as a couple of their tributaries; with a few occurrences are also mapped in the desert foothills of Jawbone North subarea, including Kelso Creek. Scattered occurrences are mapped along the Owens River floodplain, and on washes emanating from the Inyo Mountains to the east of the river and Owens Lake, as well as some washes near Haiwee Creek and Talus Canyon in the Rose Valley, all of the Owens Valley subarea.

**Unvegetated wash and river bottom Mapping Unit (6114)**




North subareas




South subareas

## Miscellaneous Classes

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

Built-up & Urban Disturbance (9300)
- Anthropogenic areas of little or no vegetation (9320)

Restoration (9400)

Exotic Trees (9500)

Sparsely vegetated recent burned areas (9701)

Water (9800)
- Perennial Stream Channel (Open Water) (9801)
- Small Earthen-dammed Ponds and Naturally Occurring Lakes (9803)
- Major Canals and Aqueducts (9804)
- Water Impoundment Feature (9805)

## 9200 – Agriculture

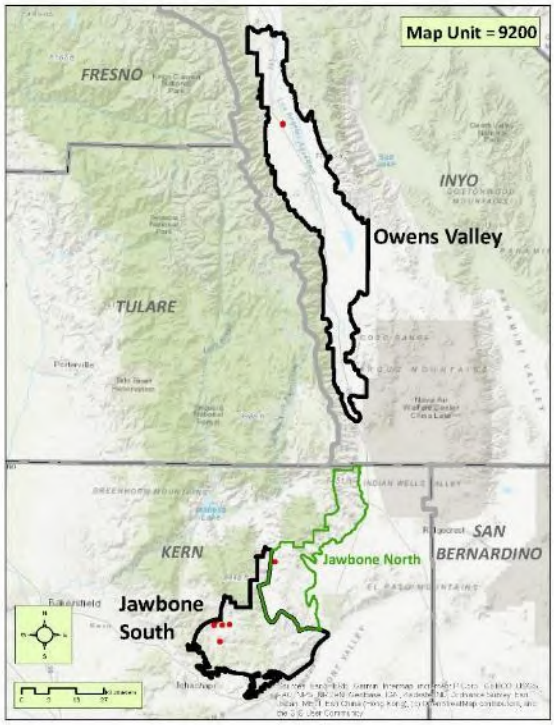
The above image is of a nursery, the only type of agriculture mapped as 9200. Note the variation in pattern.

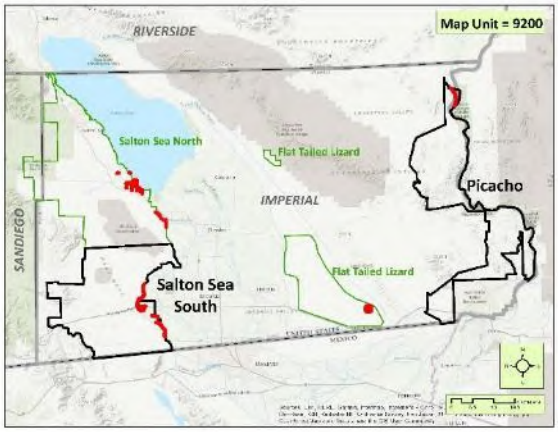
**DESCRIPTION:** The Agriculture map unit includes land used primarily for the production of food, fiber, and livestock. For this project, agricultural practices are broken down into two categories: woody orchards and vineyards (9210) and non-woody row and field crops (9220). Agriculture is further defined as planted and maintained, and not fallow for longer than a five-year period. However, this more generalized map unit is applied to miscellaneous agricultural uses such as nursery, poultry, dairy operations, and other livestock operations, such as small isolated pens with their associated field(s). The map unit may also be applied to lands where specific agricultural use cannot be determined with existing imagery (e.g. plots of land in an agricultural area that were previously used as orchard or citrus but have been cleared with no obvious land use on the base imagery). It is also used to describe field plantings where it is not evident that the site is a nursery but is covered with linear patterns of plastic.

In addition, the Agriculture map unit is used to describe corridors of agricultural drains in the agricultural area near the Salton Sea. These small agricultural channels are referred to as "lateral drains" on the USGS topographic map. They run perpendicular to major canals, typically containing two small agricultural channels, although some might have only one if they meet the MMU width requirement. The corridors may also include a road and/or a staging area for agricultural practices. (See Appendix C.)

**PHOTOINTERPRETATION SIGNATURE:** Nurseries appear similar to row crops in configuration, but the rows are often not uniform due to the numerous types of plants grown there. They may contain staging areas that can include equipment and supplies. Greenhouse structures may be present. Impounded water sources may also be located in or near the nurseries. Other signatures for the Agriculture mapping unit include areas that were previously a citrus or orchard area that are now cleared on the project base imagery. These areas appear to be smooth with no obvious land use intent and most likely recently cleared. The other common photo signature for this type is of corridors containing small agricultural drains that are often located adjacent to agricultural fields, and contain either two channels, one channel that appears to carry water consistently, or one or two channels and a road.

**9200 – Agriculture**




**DISTRIBUTION:** The Agriculture map unit was previously mapped in the Desert Center area, and in the Imperial Valley (Salton Sea Trough zone). In the current study area Agriculture Mapping Unit is mapped at many sites along the eastern edge of the Salton Sea North and South subareas, part of the greater Imperial Valley agricultural area; and one site in the southern part of the Flat-Tailed Horned Lizard subarea. It is also mapped at one site on the Colorado River floodplain of the Palo Verde Valley in the Picacho subarea. In addition, it is mapped in the vicinity of the Loraine-Twin Oaks area of the Jawbone South subarea; and in one location outside of Independence in the Owens Valley subarea.

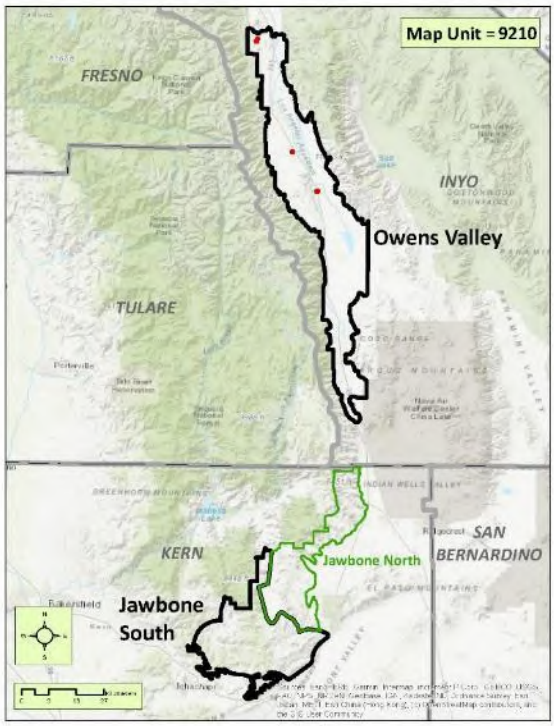
## 9210 – Woody Agriculture (orchards, vineyards)

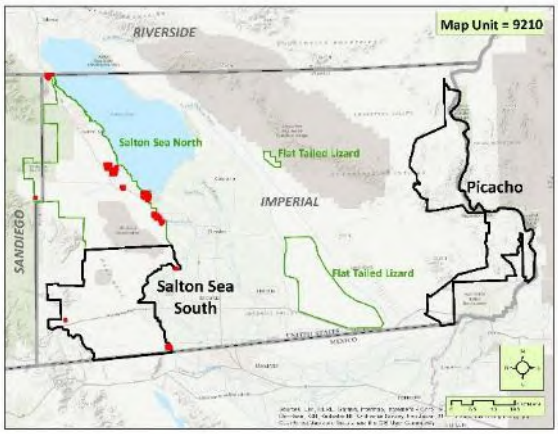
The above image is an example of an orchard. The rows at the bottom are newly planted and appear as brown dots. The more mature trees above show a dark green signature. Often times, houses are located in the middle of orchards.

**DESCRIPTION:** Woody agriculture consists of commercially productive tree, bush, and vine crops. This class includes orchards, vineyards, jojoba farms, etc. active within the five-year set of imagery prior to the base imagery. Examples include frost-sensitive citrus groves, such as grapefruit and oranges, grown in the Colorado River floodplain and Imperial Valley, and cold season deciduous crops in the Antelope Valley including pears, apples, cherries and various nut crops. This class remains valid for abandoned orchards until the trees are removed.

**PHOTOINTERPRETATION SIGNATURE:** Most image datasets evaluated in the mapping effort depict woody agriculture in leaf-on conditions and therefore contrast considerably from the adjacent non-irrigated natural vegetation. Younger stands require closer scrutiny to differentiate them from annual field and row crops. Orchard trees are typically aligned in a grid pattern, with crowns appearing to abut each other. Bush crops are similar to orchards, but may be configured in rows rather than a grid, and appear to be much shorter in height. The orchard and vineyard areas tend to be neat and uniform. Vineyards usually are aligned in evenly spaced rows about five to ten feet apart. With the exception of vineyards, which rarely occur within the mapping area, linear patterning is not accentuated in woody agriculture as significantly as in annual row crops.

**9210 – Woody Agriculture (orchards, vineyards)**




**DISTRIBUTION:** Woody agriculture is concentrated in the foothills of the Transverse Ranges, in the Colorado River floodplain, the western portions of the Chuckwalla Valley, and in the Salton Sea Trough zone. In the current study area, the Woody Agriculture Mapping Unit is mapped at several locations in the Owens Valley subarea including Manzanar, Lone Pine, and west of Poverty Hill. It is also mapped at a number of sites along the eastern edge of the Salton Sea North and South subareas as part of the Imperial Valley agricultural area.

## 9220 – Non-woody Row and Field Agriculture

The above image is an example of an irrigated agricultural field mapped as the "Non-woody Row and Field Agriculture" type in the Imperial Valley near Niland, CA. The tilling pattern of this field crop is extremely fine, a characteristic which helps differentiate this from orchards and vineyards.

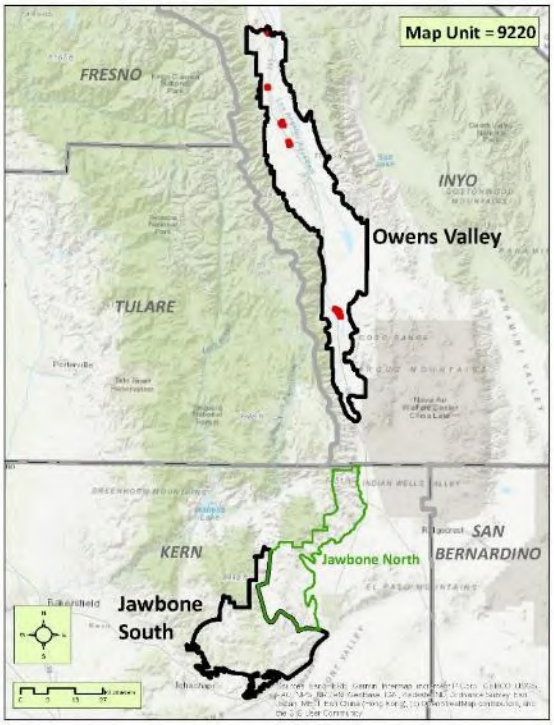
**DESCRIPTION:** This class of agriculture consists of annual non-woody row and field crops. Croplands include cultivated, in crop, harvested, fallow, or temporarily idle land. Within the DRECP area, almost all field and row crops are irrigated, with the exception of occasional dry farming of grain crops in the western Antelope Valley. Fields lay fallow for at least one season within the year. In the Antelope Valley *Atriplex polycarpa* or *Ericameria nauseosa*, both of which are rapid colonizers, may be present in recently cleared or farmed land. In the Imperial Valley fallow fields which have remained inactive for over two years may contain a sparse shrub cover, including such species as *Suaeda moquinii, Tamarix* spp., *Atriplex canescens*, and *Atriplex lentiformis.* Croplands idle for more than five years are designated with a natural vegetation class.

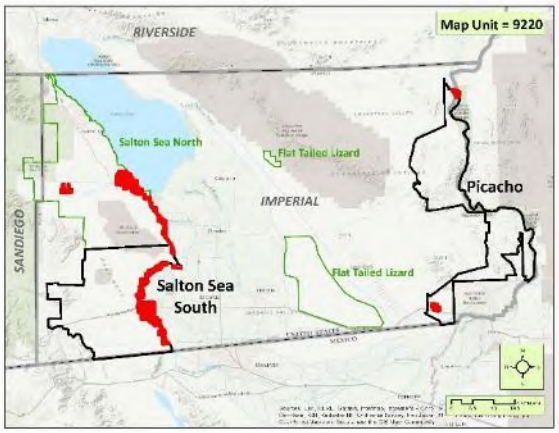
**9220 – Non-woody Row and Field Agriculture**

**PHOTOINTERPRETATION SIGNATURE:** Field and row crops have a highly variable color patterning depending on a number of factors including the planting techniques, type of harvest, and growth cycle of the particular crop. Irrigated field crops will appear as a uniform, smooth-textured area, with a green color. Row crops will appear similar, except the individual rows can be distinguished. Irrigation equipment such as sprinklers are sometimes visible. Tilling patterns in fruit and vegetable crops appear more evident and breaks in the patterning are more regular, their arrangement depending primarily on differing irrigation techniques. Non-irrigated field crops will show a dull green to mottled brown color with smooth, uniform texture. Dry farmed areas will appear very similar to natural grass vegetation.

Tilled fields will appear smooth in texture with a white to tan color. Typically, dry fields have a homogeneous tone. Depending on the moisture content of the field, its appearance can become mottled, with moister areas appearing darker. Fallow fields will have a variable cover of seral native and non-native herbaceous vegetation. The signature color and texture can vary from homogeneous to mottled with shades of green and brown.

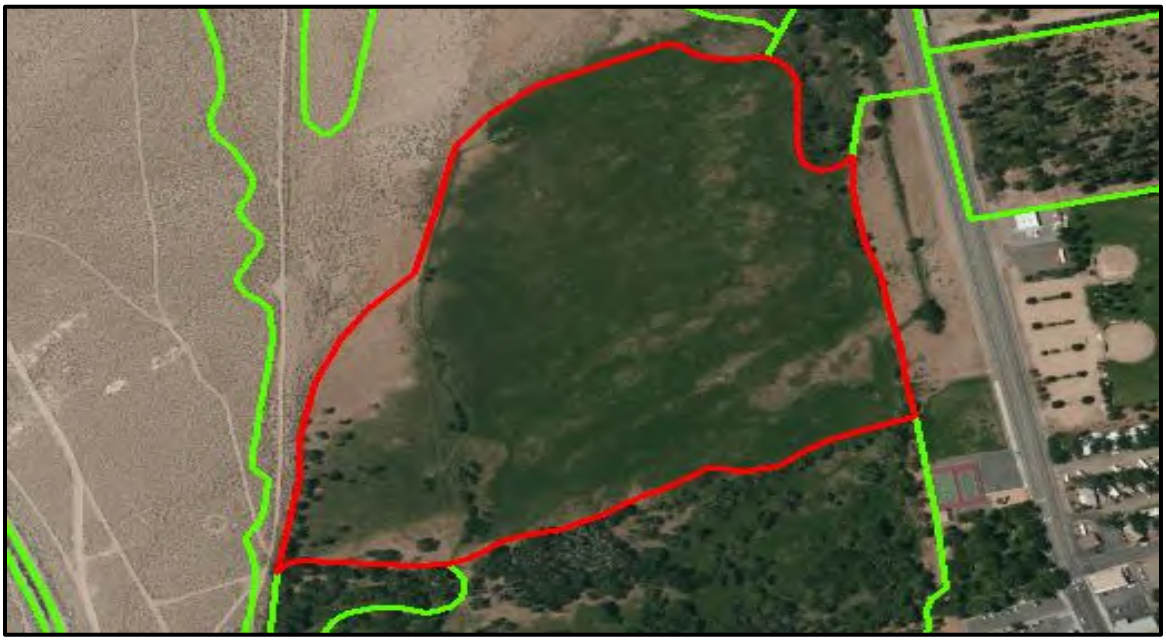
**9220 – Non-woody Row and Field Agriculture**




**DISTRIBUTION:** The largest concentration of row and field crops occurs in the Antelope Valley, the Colorado River floodplain, and the Salton Sea Trough. In the current study area, Row and Field Crops Mapping Unit is mapped extensively all along the eastern Salton Sea North and South subarea as part of the Imperial Valley agricultural area, and at one location next to San Felipe Creek. Two sites are mapped in the Picacho subarea, one in the Palo Verde Valley, and the other on Pilot Knob Mesa northwest of Yuma. Additional sites are mapped in several locations throughout the Owens Valley subarea.

## 9230 – Irrigated Pastures



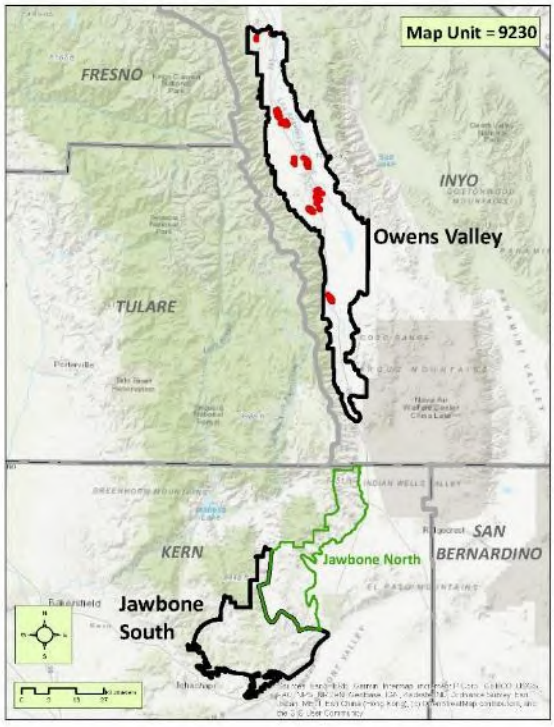
The aerial image displays an example of an irrigated pasture in the Owens Valley. These stands usually have a sharp contrast to the surrounding vegetation types, as seen here with the very green grasses emanating from a man-made water source such as a flume, drainage ditch or small canal.

**DESCRIPTION:** This class of agriculture consists of annual non-woody herbaceous crops that are used for grazing purposes. In the Owens Valley, this category is used primarily for pasturelands that are irrigated during the growing season. Water is diverted from small streams running down the eastern slopes of the Sierra Nevada and channeled into ditches and flumes that parallel the contours of the landscape. Herbaceous cover may consist of *Lolium* spp., *Phleum* spp., *Trifolium* spp., alfalfa or other species used for feed. In most settings, these grazing lands are mapped when the landscape is currently under irrigation. Emergent shrubs including *Ericameria nauseosa,* or *Rosa spp.* can occur in cover as high as 10 percent.

**PHOTOINTERPRETATION SIGNATURE:** Irrigated pastures yield a highly reflective, medium to dark green signature, at times trending toward a yellow green. Texture is very smooth even when viewed at fine scales on most imagery. There are little or no breaks in the patterning, something which is more often found in row and orchard crops. Variability in the signature brightness and color occurs along the margins of the irrigation where flooding is less frequent. Edges are often abrupt and definitive where irrigation transitions into stands of *Ericameria nauseosa* or other desert scrub vegetation.

**9230 – Irrigated Pastures**

Naturally-occurring meadows comprised of *Juncus, Carex* and wetland grasses have a similar signature but follow more predictive patterning. These seeps, springs and seasonally flooded areas are governed by the relationship of topography and surface water.




**DISTRIBUTION:** In the current study area, the Irrigated Pastures Mapping Unit is mapped at a number of sites throughout the Owens Valley subarea.

## 9300 – Built-up & Urban Disturbance

The above image 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. Photointerpreters often must take minimum mapping unit criteria and ownership (fence line) boundaries into consideration when delineating polygons.

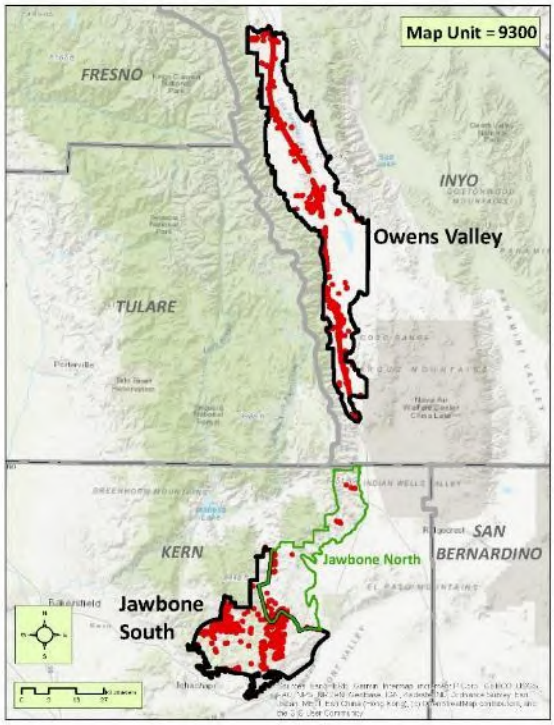
**DESCRIPTION:** Built-up areas include permanent and semi-permanent structures that are occupied/used or abandoned. Built-up areas can include residential, commercial and services, industrial, and transportation uses, as well as their associated disturbed lands. Areas under construction are also included. 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).

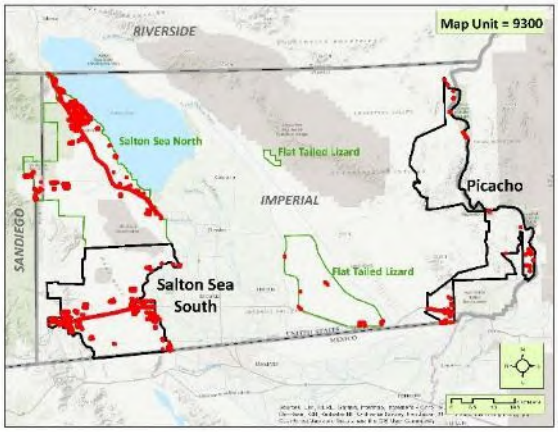
Major four-lane divided highways and freeways are included in this mapping type and are delineated to the fenced right-of-way. Near the Salton Sea, the railroad and State Route 111 run parallel and are mapped as one polygon coded as the "Built-Up & Urban Disturbance" map unit. North of the town of Frink where the railroad and State Route 111 complex is mapped, berms adjacent to the railroad have been recently scraped and devoid of vegetation. These recently disturbed berms are included in this polygon with the railroad and State Route 111. However, berms adjacent to the railroad south of Frink have not been recently altered and are vegetated. Instead of being included within the "Built-Up & Urban Disturbance" polygon, they are mapped to the appropriate vegetation type. (See Appendix E)

**9300 – Built-up & Urban Disturbance**

**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. In the alternative energy development area of the upper Jawbone Canyon watershed, clusters of wind turbines and their associated clearances are also mapped as this type.

**9300 – Built-up & Urban Disturbance**




**DISTRIBUTION:** Built-up areas occur throughout the study area. They are centered within the major developments of Barstow, Ridgecrest, Lancaster-Palmdale, Victorville-Hesperia-Apple Valley, Yucca Valley and Blythe. In the current study area, the Built up Mapping Unit is mapped in the Owens Valley subarea along the US Highway 395 corridor and includes major towns as well as ranches, the most prevalent being in the vicinity of Olancha, Lone Pine, and Independence. In the Jawbone North subarea, Built-up areas are mapped mainly in Freeman Canyon, Grapevine Canyon, and in the Kelso Valley. In the Jawbone South subarea, Built-up Mapping Unit represents the wind turbine energy farms of upper Jawbone Canyon, and the many ranches and ranchettes of the Loraine-Twin Oaks area of the Caliente Creek watershed. In the Salton Sea North and South subareas, the Mapping Unit depicts the limited built-up areas of Salton City, Ocotillo-Coyote Wells, and small ranches, solar panel farms, and mining. A few miscellaneous sites are noted in the Flat-Tailed Horned Lizard subarea. Several Built-up areas are noted in the Picacho subarea along the Colorado River floodplain as residential (mobile homes mainly), ranches, mining; and residential/commercial/government facilities along Interstate 8.

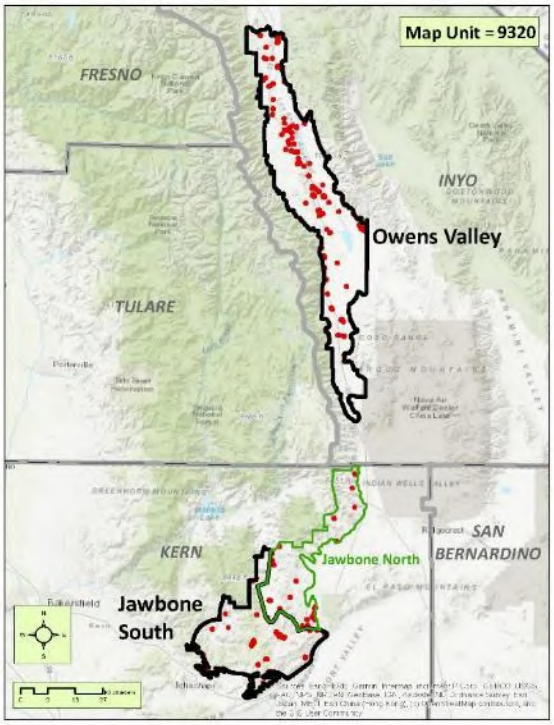
## 9320 – Anthropogenic areas of little or no vegetation

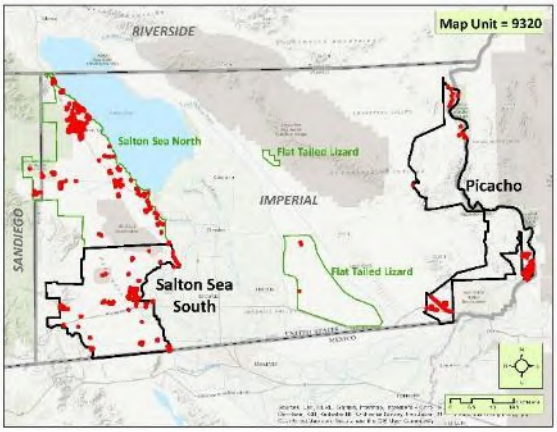
The above image is an example of an anthropogenically cleared area adjacent to a housing development.

**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 timeframe. 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 which 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.

**9320 – Anthropogenic Areas of Little or No Vegetation**




**DISTRIBUTION:** Anthropogenically cleared areas are consistently scattered throughout the Western Mojave Desert region. These areas are less common and occur only sporadically in the Central Mojave Desert. In the Colorado Desert regions, cleared areas are less frequent but still widespread except in the Salton Sea Trough zone, where they are prevalent. In the current study area, Anthropogenically Cleared Areas are mapped, mostly along the eastern side of the Salton Sea North and South subareas as vacant areas of Salton City and agricultural lands, but also along major road corridors; and mainly on the Colorado River floodplain in the north and south part of the Picacho subarea, and along Interstate 8 and the railroad. It is also mapped throughout the Owens Valley subarea, primarily in a buffer along the major road corridors. In the Jawbone North and South subareas, it is mapped in isolated locations in the desert foothills of the southern Sierra Nevada, such as Kelso Valley, and a few sites in the ranch areas of the Caliente Creek watershed area.

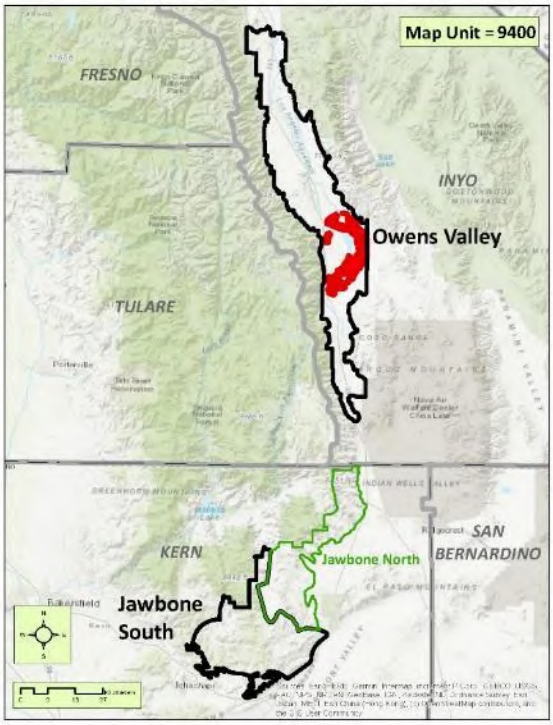
## 9400 - Restoration

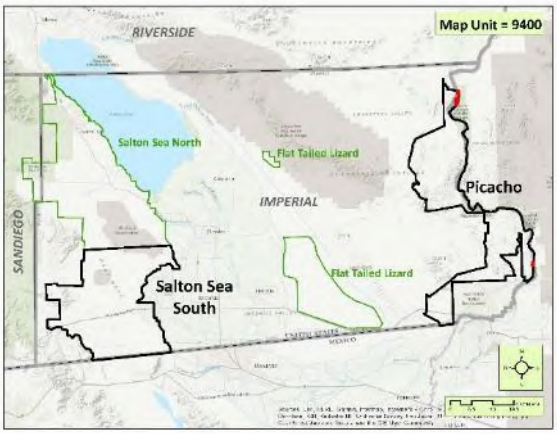
The image above displays an example of a restoration area in and around Owens Lake.

**DESCRIPTION:** Restoration sites are assigned a specially designated Mapping Unit referring to re-vegetation efforts primarily around the margins of Owens Lake and the Colorado River. Dominant plants include any combination of species comprised of *Distichlis spicata, Scirpus* spp., *Sporobolus airoides, Typha* spp., *Eleocharis* spp., and others. Smaller efforts mapped along the Colorado River have been restored with stands of *Populus fremontii* and *Salix* spp. Plant distribution and arrangement do not always follow natural landscape and restoration often occurs during periods of several years. Where vegetative cover is greater than 2%, then the restoration area is coded as the appropriate Macrogroup, Group, or Alliance type, and given a Land Use class of Vacant Land – Restoration (Land Use code 3500)

**PHOTOINTERPRETATION SIGNATURE:** Signatures in general are determined by the makeup of the dominant species being restored. Patterning is more inconsistent across the stand and does not always follow natural topography. Refer to the photointerpretation signature section for each Alliance in this document.

**9400 -Restoration**




**DISTRIBUTION:** In the current study area, Restoration Mapping Unit is mapped in the Owens Valley subarea primarily on Owens Lake; in the Picacho subarea, it is mapped on the Colorado River floodplain in the Palo Verde Valley and at Imperial Dam.

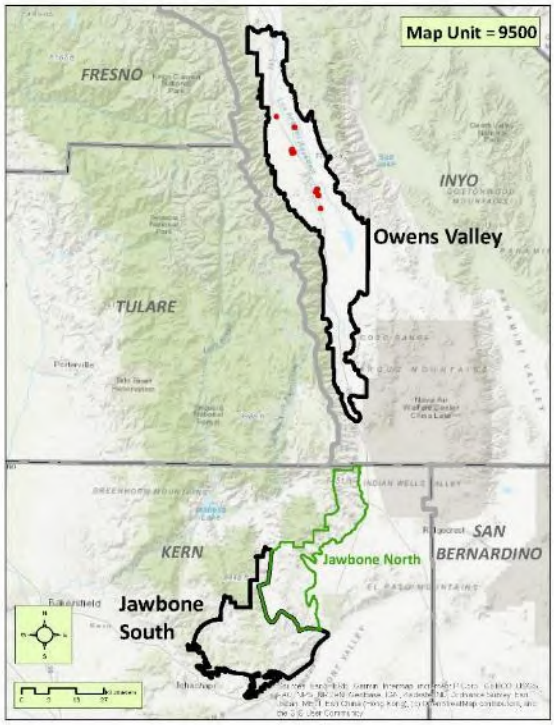
## 9500 – Exotic Trees

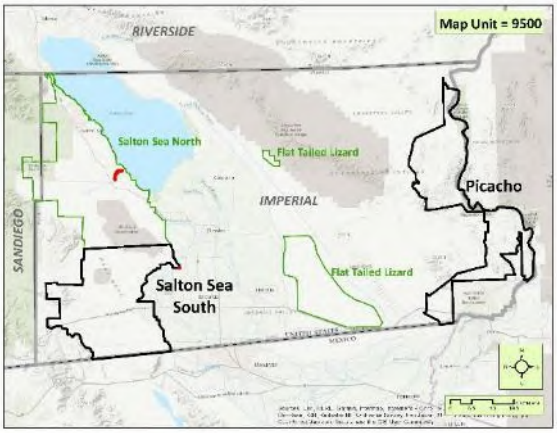
The above image is an example of exotic trees dominated by *Tamarix aphylla* adjacent to the Colorado River south of Parker Dam.

**DESCRIPTION:** Exotic trees are non-native to the area and are associated with human habitation. This category is reserved for generally non-aggressive, invasive, exotic tree species within the mapping area. Included in the exotic trees category are planted trees that remain on old home sites such as pines, non-native palms, evergreen salt cedars (*Tamarix aphylla*), and *Eucalyptus* spp. The vegetation is confined to aesthetic horticultural plantings of trees not grown for harvest, food, or other products. Note: aggressive non-tree exotics such as *Tamarix ramosissima* or *T. chinensis, Arundo donax,* Mediterranean naturalized annuals, etc., if discernible on the imagery, were mapped to their own vegetation map unit class.

**PHOTOINTERPRETATION SIGNATURE:** Exotic trees appear purposefully planted, generally not blending into the surrounding landscape. They usually form rows or follow along highways and other human-related features such as aqueducts or flood control features, or they may occur on abandoned sites where the structures have been removed. However, they are often below the project minimum mapping unit size.

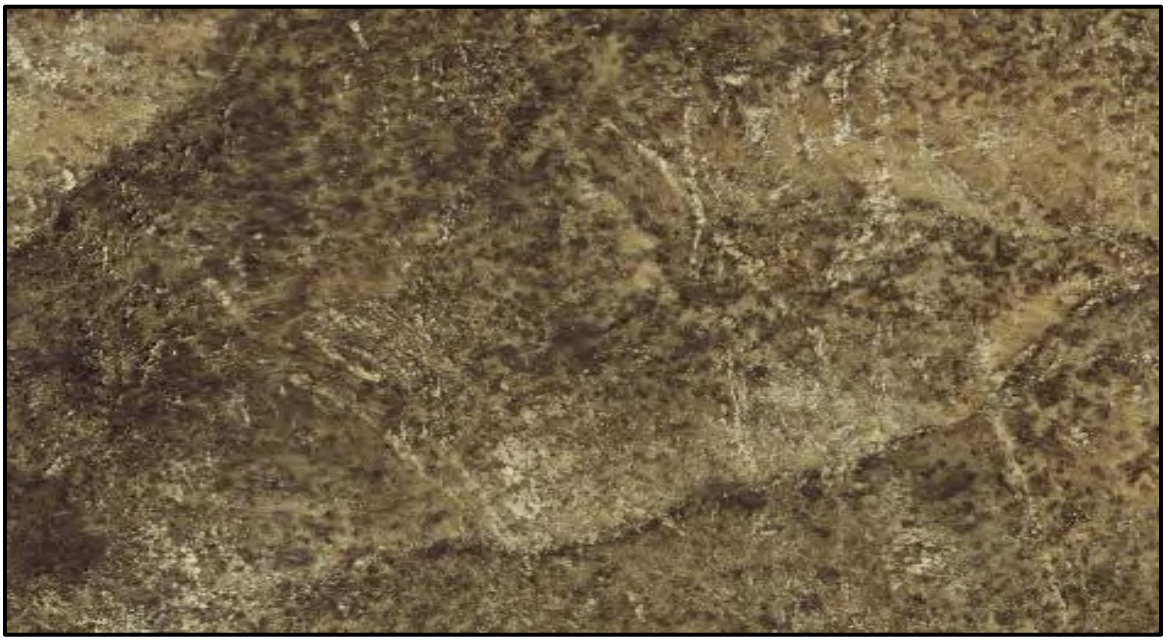
**9500 – Exotic Trees**




**DISTRIBUTION:** A limited number of mappable exotic trees are scattered in small patches in the DRECP area. Most are mapped at sites, such as along the base of the San Gabriel and San Bernardino Mountains and in the Owens Valley. In the current study area, this Mapping Unit is mapped at several sites in the vicinity of US 395, including Manzanar, in the Owens Valley subarea; at two sites, along the Trifolium Extension Canal and on the New River in the Salton Sea North and South subareas; and at one site in the Kelso Valley of the Jawbone South subarea.

## 9701 – Sparsely Vegetated Recently Burned Areas

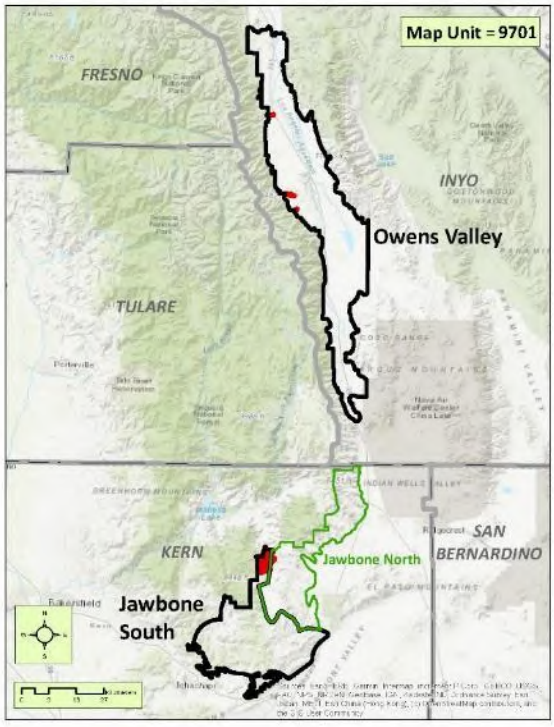


The image above is an example of a recently burned area. Dark brown charring of the vegetation and soil is evident after the fire. Note: This screenshot is a portion of a larger polygon whose entire boundary is not shown.

**DESCRIPTION:** Stands in recently burn areas where vegetation is scant and difficult to discern due to <2% shrub and herb cover. In the Owens Valley, observations from subsequent visits has shown regrowth, such as *Eriogonum fasciculatum, Encelia virginensis, Ambrosia salsola, Coleogyne ramosissima,* or *Achnatherum speciosum*. On the east slope of the Piute Mountains, fire had burned stands of *Pinus monophylla, Juniperus californica,* and *Eriogonum fasciculatum*, among others.

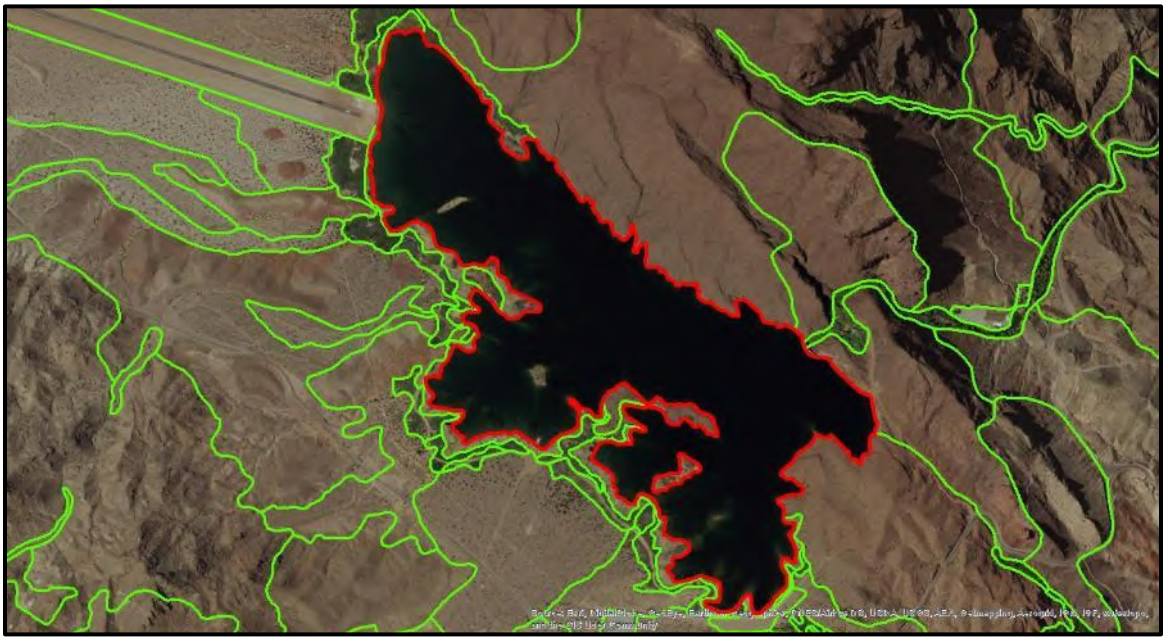
**PHOTOINTERPRETATION SIGNATURE:** Area burned within a few years with signature as white with no evidence of growth that can be seen on the base imagery. In recent burns, within a few months of imagery, black or gray ash may still be visible on the image. In the years following a burn, successional vegetation establishment may vary greatly and depends on the seasonal rainfalls that lead up to and a follow a fire. Vegetation signatures are severely altered and atypical, inhibiting the mapper's ability to identify species accurately. It is also very difficult to differentiate stands using ground data alone, in that the signature on the base imagery may have changed significantly compared to the successional vegetation reestablishing on the ground in the years following the fire.

**9701 – Sparsely Vegetated Recently Burned Areas**




**DISTRIBUTION:** In the current study area, three areas are mapped in the Owens Valley subarea from three small fires. In the Jawbone South subarea, the large Erskine fire affected the Piute Mountains north and west of Kelso Valley within the study area.

## 9800 – Water

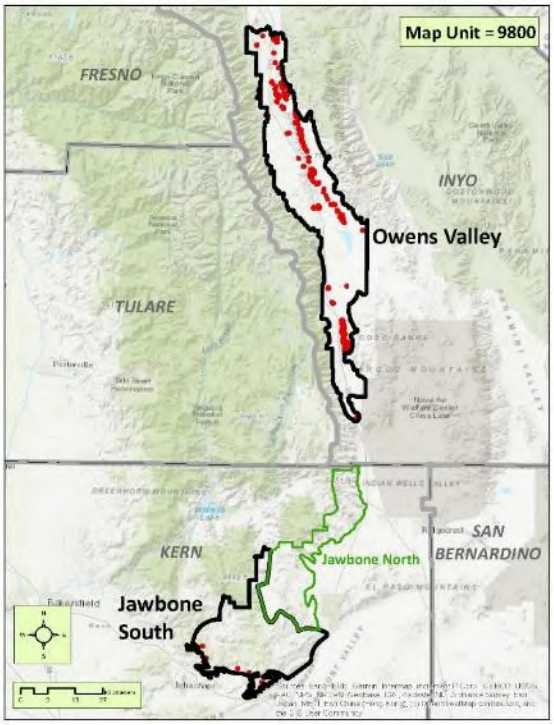


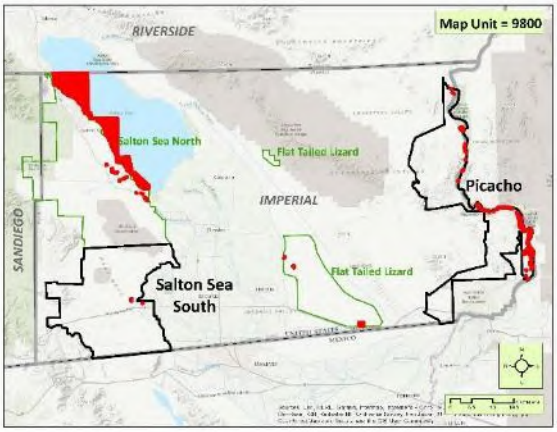
The above image is an example of a man-made reservoir (Gene Wash Reservoir) in the Whipple Mountains near Parker Dam.

**DESCRIPTION:** 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). However, in this project the more generalized 9800 code is applied to artificially created water bodies containing water supplied from sources other than the watershed upslope from the mapped feature. Some examples would include park ponds, recreational lakes within a residential development, cement-lined agricultural ponds, and reservoirs. Water bodies adjacent to but not connected to a perennial stream channel are included in this class.

**PHOTOINTERPRETATION SIGNATURE:** Many times these man-made water bodies are within an urban setting. The water will often appear as various shades of blue to black. Sun reflectance can be seen on the water surface at times. The water is mapped to the high water line. Water must be present at the time the project base imagery was flown. Water is mapped to the visible high water mark normally incurred during high rainfall years. In drier years, a "bathtub ring" signature surrounds the existing waterline.

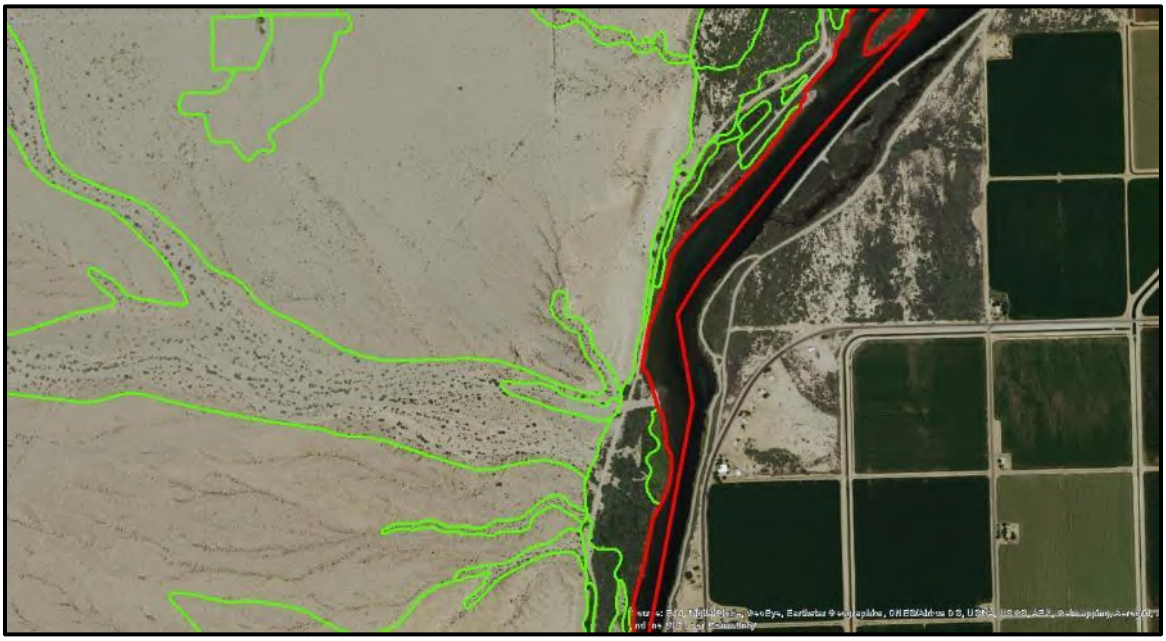
**9800 – Water**




**DISTRIBUTION:** Most of these non-naturally occurring water bodies in the study area are found in agricultural and urban areas, many of which occur in Western Mojave and Central Mojave regions, the Great Basin, the Salton Sea Trough, and along the Colorado River floodplain. In the current study area, Water map unit is mapped throughout the Owens River floodplain and at Tinemaha Reservoir, Haiwee Reservoir and Little Lake, in the Owen Valley subarea; at five sites in the Jawbone South subarea; at many locations on the Colorado River floodplain; and a number of sites (including the Salton Sea) bordering the Salton Trough in the Salton Sea North and South and the Flat-Tailed Horned Lizard subarea.

## 9801 – Perennial Stream Channel (Open Water)

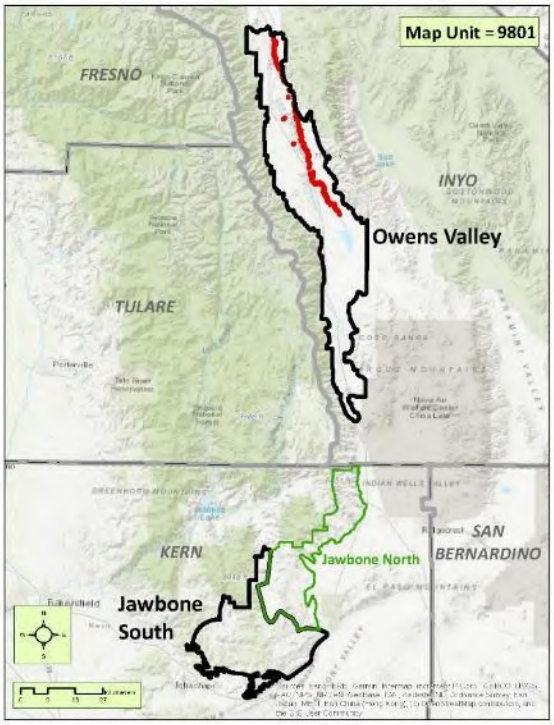


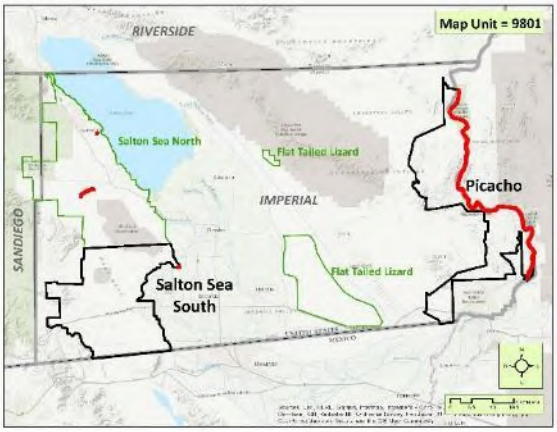
A portion of the Colorado River, a perennial stream channel, is shown above in the red polygon. Although the Colorado River extends past the eastern boundary of the perennial stream channel polygon, the study area terminates at the state boundary between California and Arizona. Note: This screenshot is a portion of a larger polygon whose entire boundary is not shown.

**DESCRIPTION:** The Perennial Stream Channel map unit consists of stream channels in which water is present during all or most of the year. This category may also include temporarily exposed flats adjacent to the main channel. This sparsely vegetated category is mapped when riparian vegetation comprises less than 8 to 10 percent cover. Water must be present over most of the polygon on all image datasets. Temporarily exposed flats and channels can be visible during several weeks of the year or during longer periods in seasons with below-average rainfall.

**PHOTOINTERPRETATION SIGNATURE:** A water signature is visible over most of the channel. Shallow water reveals a semi-opaque view of the underlying substrate and will yield a lighter color than deep water. Adjacent flats and exposed portions of the channel will show an intense light gray to white signature similar to that of a typical dry wash. Occasionally, floating aquatics and small patches of immature marsh vegetation (*Typha* spp., *Schoenoplectus* spp.) will produce a light to medium dark-green color over less active portions of the channel, especially along small side channels.

**9801 = Perennial Stream Channel (open water)**




**DISTRIBUTION:** Perennial stream channels are restricted to a few isolated locations along major creeks and rivers in the Mojave and Colorado Desert. The largest example includes the naturally flowing portions of the Colorado River south of the Parker Dam to the Mexican border. In the current study area, Perennial Stream Channels map unit is mapped on the New River and San Felipe Creek in the Salton Sea North and South subareas; as many segments of the Colorado River snaking across and back along the state line in the Picacho subarea; and one site on Kelso Creek in the Jawbone North subarea.

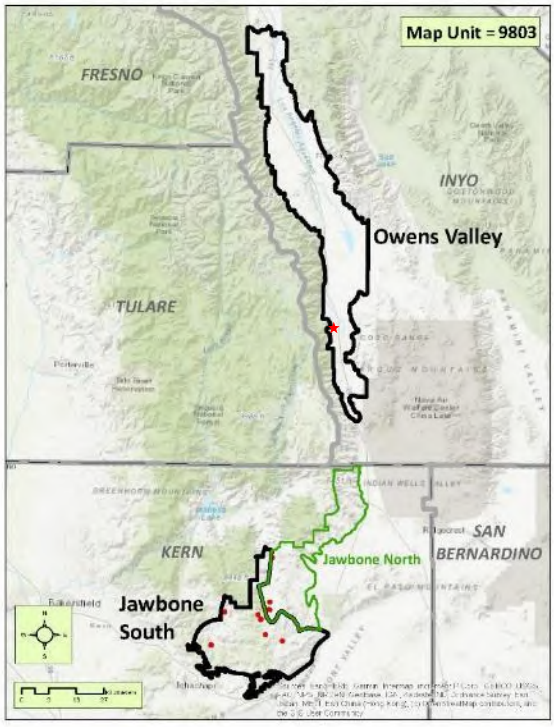
## 9803 – Small Earthen-dammed Ponds and Naturally Occurring Lakes

The above image is an example of a small earthen-dammed pond on the lower slopes of the San Bernardino Mountains above Summit Valley. The majority of the polygon boundary follows the high-water line established in high rainfall years.

**DESCRIPTION:** This class includes perennial or seasonally flooded water bodies, either occurring naturally in the landscape or impounded by earthen dams that receive their water completely from the upstream watershed. Most of these features are seasonal and become completely dry usually in the late summer to early fall. Other features, such as Lost Lake, a small oxbow lake of the Colorado River, retain water throughout most of the year. Bermed ponds in agricultural areas are not included.

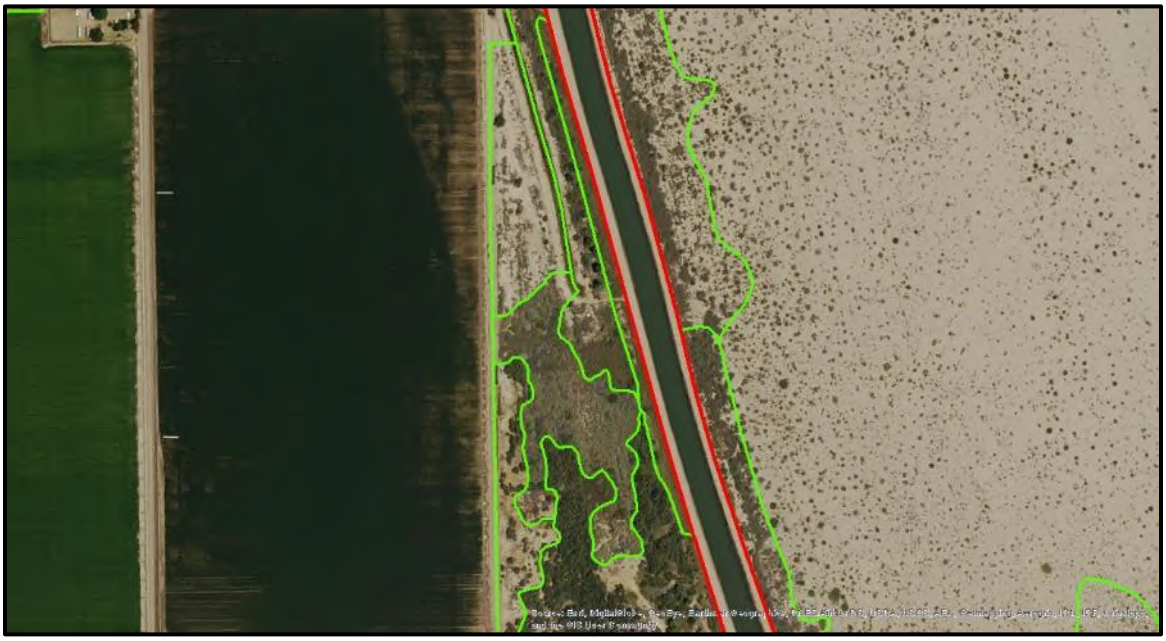
**PHOTOINTERPRETATION SIGNATURE:** Most of the features mapped in this category occur as small earthen-dammed ponds. Their characteristic signature is defined by the dark signature of deep water, lighter shades of shallower water along the margins, and varying greens and browns depicting young vegetative growth and wet mud just upslope from the recent water line. The shape of the feature is defined upslope by the topographic characteristics of the local landscape. Downslope, the shape of the feature is defined by a typically straight-lined small earthen dam.

**9803 – Small Earthen-dammed Ponds and Naturally Occurring Lakes**




**DISTRIBUTION:** Most earthen dammed ponds occur along the lower foothills of the Transverse Ranges from Summit Valley to Gorman, and in the southern Sierra Nevada and desert foothills, as well, as small naturally occurring oxbow lakes along the Colorado River. In the current study area, this map unit is mapped at several locations in the interior southern Sierra Nevada of the Jawbone South subarea; four sites in Kelso Valley in the Jawbone North subarea; and one site (represented as a star) west of Haiwee Reservoir in the Owens Valley subarea.

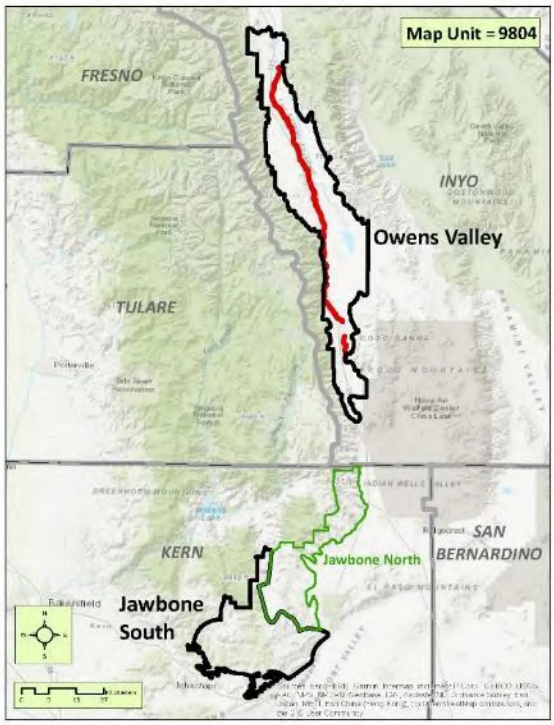
## 9804 – Major Canals and Aqueducts

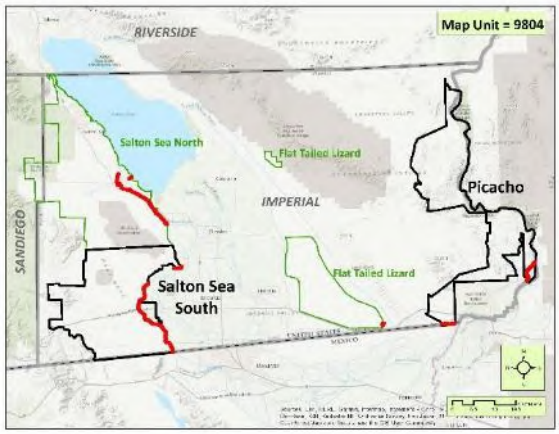


The above image shows a portion of the East Highline Canal (red polygon) located northeast of Brawley. Note: This screenshot is a portion of a larger polygon whose entire boundary is not shown.

**DESCRIPTION:** The California Aqueduct carries water collected from the rivers and streams draining the southern portion of the Cascade Range and most of the Sierra Nevada, and transports it into Southern California. The water is pumped through the Tehachapi Mountains, enters the study area and resumes its above-ground path at South Portal in the western portion of the Antelope Valley. The open Los Angeles Aqueduct begins at the Owens River and transports water from the Owens Valley to Haiwee Reservoir, where it then becomes an underground pipeline on its way to Los Angeles. The Colorado River Aqueduct begins at Lake Havasu on the California-Arizona border and terminates at Lake Mathews in Riverside County. The All American Canal transfers water from the Imperial Reservoir of the Colorado River into the Imperial Valley. It feeds the Coachella Canal, the Westside Main Canal, and the East Highline Canal. The Coachella Canal conveys water northwest to the Coachella Valley. The Westside Main Canal transports water north along the western edge of the Imperial Valley agricultural area, terminating at Brawley. The East Highline Canal transports water northwest and terminates northeast of the town of Wister. The aqueducts and canals are mapped only where open water is visible above ground. Pumping stations associated with the aqueducts and canals are mapped as Built-up & Urban Disturbance (9300). The levees (landward sides, levee roads and exposed portions above the waterline) that parallel both sides of the water feature are included in the delineation.

**PHOTOINTERPRETATION SIGNATURE:** These water features are recognized by their straight and angular linear configuration and, for the most part, visible concrete lining and extensive levees paralleling both sides of the channel. The open water channel width varies minimally across the distance of the aqueduct. The water flowing through the aqueduct appears dark, with a green, black, or blue color depending on sun reflectance on some image sources. Because of the highly fractured and disturbance characteristics of the wetland and riparian vegetation associated with (nearby and adjacent to) the Westside Main Canal, East Highline Canal, and the All American Canal, the vegetation there was mapped to a 15 meter minimum mapping width (MMW), which is half the DRECP project standard width for riparian and wetland vegetation.




**DISTRIBUTION:** This mapping unit includes the California Aqueduct, Coachella Canal, Colorado River Aqueduct, Los Angeles Aqueduct, All American Canal, and other large canals in the Imperial Valley agricultural area. In the current study area, Major Canals and Aqueducts map unit includes the Los Angeles Aqueduct in the Owens Valley subarea; the All American Canal in the Picacho subarea; the Trifolium Extension Canal, the Westside Main Canal, and a canal portion of San Felipe Creek in the Salton Sea North and South subareas; and an offshoot branch of the Coachella Canal near Gordon's Well in the Flat-Tailed Horned Lizard subarea.

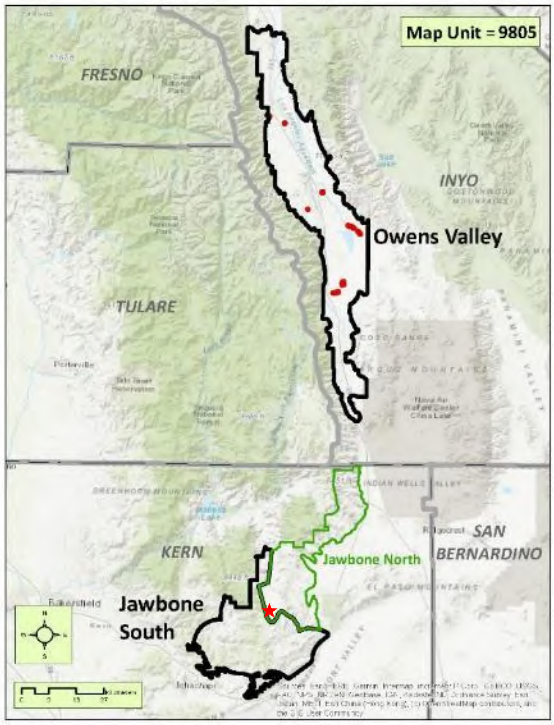
## 9805 – Water Impoundment Feature

The above image shows a water impoundment feature in the form of a duck pond (empty in this image) in the western Antelope Valley.

**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. Some impounded features with shallow water in the Owens Lake area were considered Restoration Areas (9400).

**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.

**9805 – Water Impoundment Feature**





**DISTRIBUTION:** Clusters of these water features occur within or near agricultural or developed areas throughout the Western Mojave Desert region, in portions of the Central Mojave Desert region, and in the Colorado Desert region, including the Chuckwalla Valley, Colorado River Floodplain, and the Salton Sea Trough zone, mainly in agricultural areas. In the current study area, this map unit is mapped as a number of settling ponds, agricultural ponds, duck ponds, and other features in the Salton Sea North and South subarea; on the Colorado River floodplain in the Picacho subarea; several sites in the Owens Valley subarea; and one site (represented as a star) in the Kelso Valley of the Jawbone North 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 current project (Jawbone South, Owens Valley, Picacho, and Salton Sea South subareas), in numerical order by code value. The number of polygons is presented, followed by four 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.) |
|---|---|---|---|---|---|---|
| 1111 | Quercus douglasii Alliance | 691 | 9,999.9 | 24,710.3 | 2.4% | 35.8 |
| 1112 | Quercus lobata Alliance | 15 | 25.9 | 64.0 | 0.0% | 4.3 |
| 1113 | Quercus chrysolepis Alliance | 844 | 4,363.5 | 10,782.4 | 1.1% | 12.8 |
| 1114 | Quercus wislizeni Alliance | 718 | 3,890.3 | 9,613.1 | 0.9% | 13.4 |
| 1116 | Aesculus californica Alliance | 29 | 49.3 | 121.9 | 0.0% | 4.2 |
| 1118 | Quercus kelloggii Forest Alliance | 89 | 416.2 | 1,028.4 | 0.1% | 11.6 |
| 1121 | Pinus sabiniana Alliance | 140 | 334.6 | 826.8 | 0.1% | 5.9 |
| 1122 | Juniperus californica Alliance | 1,364 | 11,932.3 | 29,485.4 | 2.9% | 21.6 |
| 1212 | Abies concolor Alliance | 20 | 82.8 | 204.5 | 0.0% | 10.2 |
| 1213 | Pinus jeffreyi Alliance | 91 | 778.5 | 1,923.6 | 0.2% | 21.1 |
| 1311 | Pinus monophylla Alliance | 1,295 | 15,151.8 | 37,440.9 | 3.7% | 28.9 |
| 1410 | Southwestern North American riparian evergreen and deciduous woodland Group | 8 | 34.3 | 84.7 | 0.0% | 10.6 |
| 1411 | Populus fremontii – Fraxinus velutina – Salix gooddingii Alliance | 235 | 344.0 | 849.9 | 0.1% | 3.6 |
| 1414 | Platanus racemosa Alliance | 5 | 3.3 | 8.3 | 0.0% | 1.7 |
| 1416 | Salix gooddingii – Salix laevigata Alliance | 695 | 440.3 | 1,088.1 | 0.1% | 1.6 |
| 1420 | Southwestern North American riparian wash/scrub Group | 1 | 0.9 | 2.3 | 0.0% | 2.3 |
| 1422 | Baccharis salicifolia Alliance | 89 | 108.4 | 267.9 | 0.0% | 3.0 |
| 1423 | Baccharis emoryi – Baccharis sergiloides Alliance | 51 | 38.2 | 94.3 | 0.0% | 1.8 |
| 1424 | Salix exigua Alliance | 341 | 239.7 | 592.4 | 0.1% | 1.7 |
| 1425 | Rhus trilobata - Crataegus rivularis - Forestiera pubescens Alliance | 271 | 126.0 | 311.4 | 0.0% | 1.1 |
| 1427 | Salix lasiolepis Alliance | 254 | 186.8 | 461.7 | 0.0% | 1.8 |
| 1431 | Phragmites australis – Arundo donax Semi-natural Stands | 92 | 141.2 | 348.9 | 0.0% | 3.8 |
| 1432 | Tamarix spp. Semi-natural Stands | 806 | 4,106.3 | 10,146.9 | 1.0% | 12.6 |
| 1512 | Populus trichocarpa Alliance | 15 | 17.6 | 43.5 | 0.0% | 2.9 |
| 1521 | Betula occidentalis Alliance | 77 | 118.6 | 293.0 | 0.0% | 3.8 |
| 1522 | Cornus sericea – Rosa woodsii – Ribes spp. Alliance | 16 | 9.0 | 22.2 | 0.0% | 1.4 |

**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.) |
|---|---|---|---|---|---|---|
| 1611 | Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia Semi-natural Alliance | 56 | 71.8 | 177.5 | 0.0% | 3.2 |
| 2111 | Arctostaphylos glauca Alliance | 3 | 5.6 | 13.7 | 0.0% | 4.6 |
| 2116 | Ceanothus cuneatus Alliance | 446 | 999.3 | 2,469.4 | 0.2% | 5.5 |
| 2117 | Arctostaphylos viscida Alliance | 140 | 359.1 | 887.3 | 0.1% | 6.3 |
| 2123 | Ceanothus oliganthus – Ceanothus leucodermis Alliance | 13 | 53.0 | 131.0 | 0.0% | 10.1 |
| 2131 | Cercocarpus montanus Alliance | 275 | 1,097.5 | 2,711.9 | 0.3% | 9.9 |
| 2214 | Ericameria linearifolia – Cleome isomeris Alliance | 17 | 19.2 | 47.5 | 0.0% | 2.8 |
| 2217 | Corethrogyne filaginifolia – Eriogonum (elongatum, nudum) Alliance | 3 | 2.6 | 6.3 | 0.0% | 2.1 |
| 2221 | Eriogonum fasciculatum – (Viguiera parishii) Alliance | 530 | 7,777.8 | 19,219.3 | 1.9% | 36.3 |
| 2222 | Eriogonum wrightii – Eriogonum heermannii – Buddleja utahensis Alliance | 234 | 664.2 | 1,641.4 | 0.2% | 7.0 |
| 2226 | Eriogonum fasciculatum Alliance | 706 | 1,808.8 | 4,469.7 | 0.4% | 6.3 |
| 2305 | California annual and perennial grassland (Native component) Mapping Unit | 415 | 2,498.9 | 6,175.0 | 0.6% | 14.9 |
| 2310 | California annual forb/grass vegetation Group | 1 | 47.2 | 116.6 | 0.0% | 116.6 |
| 2330 | Mediterranean California naturalized annual and perennial grassland Group | 63 | 839.7 | 2,074.9 | 0.2% | 32.9 |
| 2331 | Brassica tournefortii – Malcolmia africana Semi-natural Stands | 1 | 0.8 | 2.0 | 0.0% | 2.0 |
| 3110 | Vancouverian and Rocky Mountain naturalized annual grassland Group | 194 | 768.1 | 1,897.9 | 0.2% | 9.8 |
| 3211 | Ribes quercetorum Provisional Alliance | 29 | 9.9 | 24.6 | 0.0% | 0.8 |
| 3212 | Ceanothus cordulatus – Ceanothus integerrimus Alliance | 5 | 5.2 | 12.8 | 0.0% | 2.6 |
| 3312 | Quercus john-tuckeri Alliance | 620 | 6,502.7 | 16,068.4 | 1.6% | 25.9 |
| 3316 | Ceanothus greggii – Fremontodendron californicum Alliance | 55 | 429.6 | 1,061.6 | 0.1% | 19.3 |
| 3410 | Arid West freshwater emergent marsh Group | 117 | 342.6 | 846.5 | 0.1% | 7.2 |
| 3411 | Phragmites australis ssp. americanus Association (formerly Alliance) | 1 | 0.1 | 0.1 | 0.0% | 0.1 |
| 3412 | Schoenoplectus (acutus, californicus) Alliance | 465 | 805.7 | 1,990.8 | 0.2% | 4.3 |
| 3415 | Typha (angustifolia, domingensis, latifolia) Mapping Unit | 2 | 3.5 | 8.8 | 0.0% | 4.4 |
| 3416 | Typha (angustifolia, domingensis, latifolia) Alliance | 429 | 599.8 | 1,482.2 | 0.1% | 3.5 |

**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.) |
|---|---|---|---|---|---|---|
| 3510 | Californian mixed annual/perennial freshwater vernal pool/swale/plain bottomland Group | 1 | 0.2 | 0.4 | 0.0% | 0.4 |
| 3611 | Juncus arcticus (var. balticus, mexicanus) Alliance | 448 | 270.4 | 668.3 | 0.1% | 1.5 |
| 3700 | Warm Semi-Desert/Mediterranean Alkali-Saline Wetland Macrogroup | 18 | 926.7 | 2,290.0 | 0.2% | 127.2 |
| 3710 | Southwestern North America alkali marsh/seep vegetation Group | 1 | 5.4 | 13.3 | 0.0% | 13.3 |
| 3712 | Sporobolus airoides – Muhlenbergia asperifolia – Spartina gracilis Alliance | 957 | 3,744.3 | 9,252.5 | 0.9% | 9.7 |
| 3713 | Anemopsis californica – Helianthus nuttallii – Solidago spectabilis Alliance | 64 | 73.9 | 182.7 | 0.0% | 2.9 |
| 3715 | Bolboschoenus maritimus, Schoenoplectus americanus Mapping Unit | 40 | 99.8 | 246.5 | 0.0% | 6.2 |
| 3721 | Allenrolfea occidentalis Alliance | 15 | 86.5 | 213.9 | 0.0% | 14.3 |
| 3722 | Atriplex lentiformis Alliance | 146 | 766.0 | 1,892.8 | 0.2% | 13.0 |
| 3725 | Suaeda moquinii Mapping Unit | 26 | 253.1 | 625.5 | 0.1% | 24.1 |
| 3726 | Distichlis spicata Alliance | 864 | 3,266.5 | 8,071.6 | 0.8% | 9.3 |
| 3728 | Isocoma acradenia Association (formerly Alliance) | 19 | 153.1 | 378.4 | 0.0% | 19.9 |
| 4110 | Lower bajada and fan Mojavean-Sonoran desert scrub Group | 1 | 3.0 | 7.4 | 0.0% | 7.4 |
| 4111 | Ambrosia dumosa Alliance | 252 | 8,774.0 | 21,680.9 | 2.1% | 86.0 |
| 4113 | Atriplex polycarpa Alliance | 393 | 11,983.1 | 29,610.9 | 2.9% | 75.3 |
| 4114 | Encelia farinosa Alliance | 282 | 7,528.4 | 18,603.0 | 1.8% | 66.0 |
| 4115 | Larrea tridentata – Ambrosia dumosa Alliance | 878 | 51,472.8 | 127,192.0 | 12.5% | 144.9 |
| 4118 | Larrea tridentata – Encelia farinosa Alliance | 305 | 26,240.6 | 64,841.9 | 6.4% | 212.6 |
| 4119 | Larrea tridentata Alliance | 1,058 | 39,786.0 | 98,313.3 | 9.7% | 92.9 |
| 4122 | Pleuraphis rigida Alliance | 8 | 115.4 | 285.1 | 0.0% | 35.6 |
| 4124 | Cylindropuntia bigelovii Alliance | 3 | 37.7 | 93.1 | 0.0% | 31.0 |
| 4152 | Carnegiea gigantea - Parkinsonia microphylla - Prosopis velutina Alliance | 8 | 135.6 | 335.0 | 0.0% | 41.9 |
| 4211 | Ephedra californica Alliance | 1 | 0.7 | 1.6 | 0.0% | 1.6 |
| 4212 | Lepidospartum squamatum Alliance | 77 | 485.8 | 1,200.3 | 0.1% | 15.6 |
| 4213 | Ericameria paniculata Alliance | 19 | 59.2 | 146.2 | 0.0% | 7.7 |
| 4216 | Ambrosia salsola Mapping Unit | 73 | 966.5 | 2,388.3 | 0.2% | 32.7 |
| 4219 | Psorothamnus fremontii – Psorothamnus polydenius Alliance | 37 | 2,763.7 | 6,829.3 | 0.7% | 184.6 |

**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.) |
|---|---|---|---|---|---|---|
| 4221 | Pluchea sericea Alliance | 159 | 606.0 | 1,497.4 | 0.1% | 9.4 |
| 4222 | Prosopis glandulosa – Prosopis velutina – Prosopis pubescens Alliance | 383 | 944.8 | 2,334.8 | 0.2% | 6.1 |
| 4225 | Psorothamnus spinosus Sub-alliance | 100 | 659.0 | 1,628.3 | 0.2% | 16.3 |
| 4226 | Acacia greggii – Hyptis emoryi – Justicia californica Alliance | 24 | 105.0 | 259.4 | 0.0% | 10.8 |
| 4227 | Parkinsonia florida – Olneya tesota Alliance | 1,086 | 5,926.9 | 14,645.6 | 1.4% | 13.5 |
| 4229 | Castela emoryi Special Stands | 1 | 31.5 | 77.8 | 0.0% | 77.8 |
| 5111 | Atriplex canescens Alliance | 165 | 3,097.8 | 7,654.7 | 0.8% | 46.4 |
| 5112 | Atriplex confertifolia Alliance | 206 | 7,185.3 | 17,755.4 | 1.7% | 86.2 |
| 5211 | Encelia (actoni, virginensis) – Viguiera reticulata Alliance | 5 | 78.3 | 193.4 | 0.0% | 38.7 |
| 5212 | Ericameria nauseosa Alliance | 499 | 3,395.7 | 8,391.0 | 0.8% | 16.8 |
| 5217 | Ericameria nauseosa – Atriplex lentiformis Mapping Unit | 675 | 5,432.0 | 13,422.7 | 1.3% | 19.9 |
| 5311 | Artemisia tridentata Alliance | 551 | 3,319.3 | 8,202.2 | 0.8% | 14.9 |
| 5416 | Ericameria teretifolia Alliance | 32 | 128.1 | 316.6 | 0.0% | 9.9 |
| 5417 | Ephedra viridis Alliance | 232 | 914.1 | 2,258.8 | 0.2% | 9.7 |
| 5419 | Ephedra nevadensis - Lycium andersonii - Grayia spinosa Alliance | 582 | 29,713.5 | 73,423.7 | 7.2% | 126.2 |
| 5421 | Coleogyne ramosissima Alliance | 318 | 7,329.2 | 18,110.9 | 1.8% | 57.0 |
| 5422 | Purshia tridentata – Artemisia tridentata Alliance | 66 | 1,862.8 | 4,603.2 | 0.5% | 69.7 |
| 5423 | Yucca brevifolia Alliance | 81 | 995.5 | 2,460.0 | 0.2% | 30.4 |
| 5431 | Achnatherum speciosum Alliance | 3 | 8.2 | 20.2 | 0.0% | 6.7 |
| 5441 | Cercocarpus ledifolius Alliance | 1 | 1.5 | 3.6 | 0.0% | 3.6 |
| 5511 | Sarcobatus vermiculatus Alliance | 600 | 20,267.2 | 50,081.5 | 4.9% | 83.5 |
| 6110 | North American warm desert bedrock cliff and outcrop Group | 281 | 3,576.7 | 8,838.3 | 0.9% | 31.5 |
| 6111 | Atriplex hymenelytra Alliance | 19 | 164.6 | 406.6 | 0.0% | 21.4 |
| 6113 | Mud Hills sparsely vegetated ephemeral herbs Mapping Unit | 239 | 8,225.0 | 20,324.4 | 2.0% | 85.0 |
| 6114 | Unvegetated wash and river bottom Mapping Unit | 285 | 1,382.4 | 3,416.0 | 0.3% | 12.0 |
| 6115 | Massive sparsely vegetated rock outcrop Mapping Unit | 86 | 892.2 | 2,204.6 | 0.2% | 25.6 |
| 6116 | Sparsely vegetated playa Mapping Unit | 602 | 13,847.5 | 34,218.0 | 3.4% | 56.8 |

**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.) |
|---|---|---|---|---|---|---|
| 6117 | Chorizanthe rigida – Geraea canescens Desert Pavement Sparsely Vegetated Alliance | 865 | 19,364.0 | 47,849.4 | 4.7% | 55.3 |
| 6120 | North American warm desert dunes and sand flats Group | 21 | 661.9 | 1,635.7 | 0.2% | 77.9 |
| 6121 | Dicoria canescens – Abronia villosa - Panicum urvilleanum Alliance | 92 | 2,032.1 | 5,021.4 | 0.5% | 54.6 |
| 7211 | Ambrosia salsola – Bebbia juncea Alliance | 104 | 962.9 | 2,379.5 | 0.2% | 22.9 |
| 7212 | Prunus fasciculata – Salazaria mexicana Alliance | 190 | 506.2 | 1,250.7 | 0.1% | 6.6 |
| 7222 | Chilopsis linearis – Psorothamnus spinosus Alliance | 56 | 100.0 | 247.0 | 0.0% | 4.4 |
| 7411 | Suaeda moquinii – Isocoma acradenia Alliance | 59 | 1,219.3 | 3,012.9 | 0.3% | 51.1 |
| 9200 | Agriculture | 19 | 119.4 | 295.1 | 0.0% | 15.5 |
| 9210 | Woody Agriculture (orchards, vineyards) | 9 | 111.1 | 274.6 | 0.0% | 30.5 |
| 9220 | Non-woody Row and Field Agriculture | 27 | 5,607.5 | 13,856.4 | 1.4% | 513.2 |
| 9230 | Irrigated Pastures | 38 | 960.7 | 2,374.1 | 0.2% | 62.5 |
| 9300 | Built-up & Urban Disturbance | 735 | 4,653.4 | 11,498.8 | 1.1% | 15.6 |
| 9320 | Anthropogenic Areas of Little or No Vegetation | 226 | 1,398.7 | 3,456.4 | 0.3% | 15.3 |
| 9400 | Restoration | 16 | 10,355.0 | 25,587.7 | 2.5% | 1,599.2 |
| 9500 | Exotic Trees | 12 | 60.9 | 150.5 | 0.0% | 12.5 |
| 9701 | Sparsely Vegetated Recently Burned Areas | 43 | 1,482.0 | 3,662.2 | 0.4% | 85.2 |
| 9800 | Water | 279 | 1,547.4 | 3,823.7 | 0.4% | 13.7 |
| 9801 | Perennial Stream Channel (Open Water) | 146 | 820.4 | 2,027.3 | 0.2% | 13.9 |
| 9803 | Small Earthen-dammed Ponds and Naturally Occurring Lakes | 8 | 2.4 | 5.8 | 0.0% | 0.7 |
| 9804 | Major Canals and Aqueducts (Open Water) | 17 | 470.4 | 1,162.3 | 0.1% | 68.4 |
| 9805 | Water Impoundment Feature | 18 | 254.6 | 629.2 | 0.1% | 35.0 |
| | **Totals** | 29,327 | 411,431.0 | 1,016,668.1 | 100.0% | 34.7 |

**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.) |
|---|---|---|---|---|---|---|
| 1212 | Abies concolor Alliance | 20 | 82.8 | 204.5 | 0.0% | 10.2 |
| 4226 | Acacia greggii – Hyptis emoryi – Justicia californica Alliance | 24 | 105.0 | 259.4 | 0.0% | 10.8 |
| 5431 | Achnatherum speciosum Alliance | 3 | 8.2 | 20.2 | 0.0% | 6.7 |
| 1116 | Aesculus californica Alliance | 29 | 49.3 | 121.9 | 0.0% | 4.2 |
| 9200 | Agriculture | 19 | 119.4 | 295.1 | 0.0% | 15.5 |
| 3721 | Allenrolfea occidentalis Alliance | 15 | 86.5 | 213.9 | 0.0% | 14.3 |
| 4111 | Ambrosia dumosa Alliance | 252 | 8,774.0 | 21,680.9 | 2.1% | 86.0 |
| 7211 | Ambrosia salsola – Bebbia juncea Alliance | 104 | 966.5 | 2,388.3 | 0.2% | 23.0 |
| 4216 | Ambrosia salsola Mapping Unit | 73 | 962.9 | 2,379.5 | 0.2% | 32.6 |
| 3713 | Anemopsis californica – Helianthus nuttallii – Solidago spectabilis Alliance | 64 | 73.9 | 182.7 | 0.0% | 2.9 |
| 9320 | Anthropogenic Areas of Little or No Vegetation | 226 | 1,398.7 | 3,456.4 | 0.3% | 15.3 |
| 2111 | Arctostaphylos glauca Alliance | 3 | 5.6 | 13.7 | 0.0% | 4.6 |
| 2117 | Arctostaphylos viscida Alliance | 140 | 359.1 | 887.3 | 0.1% | 6.3 |
| 3410 | Arid West freshwater emergent marsh Group | 117 | 342.6 | 846.5 | 0.1% | 7.2 |
| 5311 | Artemisia tridentata Alliance | 551 | 3,319.3 | 8,202.2 | 0.8% | 14.9 |
| 5111 | Atriplex canescens Alliance | 165 | 3,097.8 | 7,654.7 | 0.8% | 46.4 |
| 5112 | Atriplex confertifolia Alliance | 206 | 7,185.3 | 17,755.4 | 1.7% | 86.2 |
| 6111 | Atriplex hymenelytra Alliance | 19 | 164.6 | 406.6 | 0.0% | 21.4 |
| 3722 | Atriplex lentiformis Alliance | 146 | 766.0 | 1,892.8 | 0.2% | 13.0 |
| 4113 | Atriplex polycarpa Alliance | 393 | 11,983.1 | 29,610.9 | 2.9% | 75.3 |
| 1423 | Baccharis emoryi – Baccharis sergiloides Alliance | 51 | 38.2 | 94.3 | 0.0% | 1.8 |
| 1422 | Baccharis salicifolia Alliance | 89 | 108.4 | 267.9 | 0.0% | 3.0 |
| 1521 | Betula occidentalis Alliance | 77 | 118.6 | 293.0 | 0.0% | 3.8 |

**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.) |
|---|---|---|---|---|---|---|
| 3715 | Bolboschoenus maritimus, Schoenoplectus americanus Mapping Unit | 40 | 99.8 | 246.5 | 0.0% | 6.2 |
| 2331 | Brassica tournefortii – Malcolmia africana Semi-natural Stands | 1 | 0.8 | 2.0 | 0.0% | 2.0 |
| 9300 | Built-up & Urban Disturbance | 735 | 4,653.4 | 11,498.8 | 1.1% | 15.6 |
| 2305 | California annual and perennial grassland (Native component) Mapping Unit | 415 | 2,498.9 | 6,175.0 | 0.6% | 14.9 |
| 2310 | California annual forb/grass vegetation Group | 1 | 47.2 | 116.6 | 0.0% | 116.6 |
| 3510 | Californian mixed annual/perennial freshwater vernal pool/swale/plain bottomland Group | 1 | 0.2 | 0.4 | 0.0% | 0.4 |
| 4152 | Carnegiea gigantea - Parkinsonia microphylla - Prosopis velutina Alliance | 8 | 31.5 | 77.8 | 0.0% | 9.7 |
| 4229 | Castela emoryi Special Stands | 1 | 5.2 | 12.8 | 0.0% | 12.8 |
| 3212 | Ceanothus cordulatus – Ceanothus integerrimus Alliance | 5 | 999.3 | 2,469.4 | 0.2% | 493.9 |
| 2116 | Ceanothus cuneatus Alliance | 446 | 429.6 | 1,061.6 | 0.1% | 2.4 |
| 3316 | Ceanothus greggii – Fremontodendron californicum Alliance | 55 | 53.0 | 131.0 | 0.0% | 2.4 |
| 2123 | Ceanothus oliganthus – Ceanothus leucodermis Alliance | 13 | 1.5 | 3.6 | 0.0% | 0.3 |
| 5441 | Cercocarpus ledifolius Alliance | 1 | 1,097.5 | 2,711.9 | 0.3% | 2,711.9 |
| 2131 | Cercocarpus montanus Alliance | 275 | 100.0 | 247.0 | 0.0% | 0.9 |
| 7222 | Chilopsis linearis – Psorothamnus spinosus Alliance | 56 | 19,364.0 | 47,849.4 | 4.7% | 854.5 |
| 6117 | Chorizanthe rigida – Geraea canescens Desert Pavement Sparsely Vegetated Alliance | 865 | 7,329.2 | 18,110.9 | 1.8% | 20.9 |
| 5421 | Coleogyne ramosissima Alliance | 318 | 2.6 | 6.3 | 0.0% | 0.0 |
| 2217 | Corethrogyne filaginifolia – Eriogonum (elongatum, nudum) Alliance | 3 | 9.0 | 22.2 | 0.0% | 7.4 |
| 1522 | Cornus sericea – Rosa woodsii – Ribes spp. Alliance | 16 | 37.7 | 93.1 | 0.0% | 5.8 |
| 4124 | Cylindropuntia bigelovii Alliance | 3 | 2,032.1 | 5,021.4 | 0.5% | 1,673.8 |
| 6121 | Dicoria canescens – Abronia villosa - Panicum urvilleanum Alliance | 92 | 3,266.5 | 8,071.6 | 0.8% | 87.7 |

**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.) |
|---|---|---|---|---|---|---|
| 3726 | Distichlis spicata Alliance | 864 | 78.3 | 193.4 | 0.0% | 0.2 |
| 5211 | Encelia (actoni, virginensis) – Viguiera reticulata Alliance | 5 | 7,528.4 | 18,603.0 | 1.8% | 3,720.6 |
| 4114 | Encelia farinosa Alliance | 282 | 0.7 | 1.6 | 0.0% | 0.0 |
| 4211 | Ephedra californica Alliance | 1 | 29,713.5 | 73,423.7 | 7.2% | 73,423.7 |
| 5419 | Ephedra nevadensis - Lycium andersonii - Grayia spinosa Alliance | 582 | 914.1 | 2,258.8 | 0.2% | 3.9 |
| 5417 | Ephedra viridis Alliance | 232 | 19.2 | 47.5 | 0.0% | 0.2 |
| 2214 | Ericameria linearifolia – Cleome isomeris Alliance | 17 | 5,432.0 | 13,422.7 | 1.3% | 789.6 |
| 5217 | Ericameria nauseosa – Atriplex lentiformis Mapping Unit | 675 | 3,395.7 | 8,391.0 | 0.8% | 12.4 |
| 5212 | Ericameria nauseosa Alliance | 499 | 59.2 | 146.2 | 0.0% | 0.3 |
| 4213 | Ericameria paniculata Alliance | 19 | 128.1 | 316.6 | 0.0% | 16.7 |
| 5416 | Ericameria teretifolia Alliance | 32 | 7,777.8 | 19,219.3 | 1.9% | 600.6 |
| 2221 | Eriogonum fasciculatum – (Viguiera parishii) Alliance | 530 | 1,808.8 | 4,469.7 | 0.4% | 8.4 |
| 2226 | Eriogonum fasciculatum Alliance | 706 | 664.2 | 1,641.4 | 0.2% | 2.3 |
| 2222 | Eriogonum wrightii – Eriogonum heermannii – Buddleja utahensis Alliance | 234 | 71.8 | 177.5 | 0.0% | 0.8 |
| 1611 | Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia Semi-natural Alliance | 56 | 60.9 | 150.5 | 0.0% | 2.7 |
| 9500 | Exotic Trees | 12 | 126.0 | 311.4 | 0.0% | 26.0 |
| 9230 | Irrigated Pastures | 38 | 960.7 | 2,374.1 | 0.2% | 62.5 |
| 3728 | Isocoma acradenia Association (formerly Alliance) | 19 | 153.1 | 378.4 | 0.0% | 19.9 |
| 3611 | Juncus arcticus (var. balticus, mexicanus) Alliance | 448 | 270.4 | 668.3 | 0.1% | 1.5 |
| 1122 | Juniperus californica Alliance | 1,364 | 11,932.3 | 29,485.4 | 2.9% | 21.6 |
| 4115 | Larrea tridentata – Ambrosia dumosa Alliance | 878 | 51,472.8 | 127,192.0 | 12.5% | 144.9 |
| 4118 | Larrea tridentata – Encelia farinosa Alliance | 305 | 26,240.6 | 64,841.9 | 6.4% | 212.6 |

**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.) |
|---|---|---|---|---|---|---|
| 4119 | Larrea tridentata Alliance | 1,058 | 39,786.0 | 98,313.3 | 9.7% | 92.9 |
| 4212 | Lepidospartum squamatum Alliance | 77 | 485.8 | 1,200.3 | 0.1% | 15.6 |
| 4110 | Lower bajada and fan Mojavean-Sonoran desert scrub Group | 1 | 3.0 | 7.4 | 0.0% | 7.4 |
| 9804 | Major Canals and Aqueducts (Open Water) | 17 | 470.4 | 1,162.3 | 0.1% | 68.4 |
| 6115 | Massive sparsely vegetated rock outcrop Mapping Unit | 86 | 892.2 | 2,204.6 | 0.2% | 25.6 |
| 2330 | Mediterranean California naturalized annual and perennial grassland Group | 63 | 839.7 | 2,074.9 | 0.2% | 32.9 |
| 6113 | Mud Hills sparsely vegetated ephemeral herbs Mapping Unit | 239 | 8,225.0 | 20,324.4 | 2.0% | 85.0 |
| 9220 | Non-woody Row and Field Agriculture | 27 | 5,607.5 | 13,856.4 | 1.4% | 513.2 |
| 6110 | North American warm desert bedrock cliff and outcrop Group | 281 | 3,576.7 | 8,838.3 | 0.9% | 31.5 |
| 6120 | North American warm desert dunes and sand flats Group | 21 | 661.9 | 1,635.7 | 0.2% | 77.9 |
| 4227 | Parkinsonia florida – Olneya tesota Alliance | 1,086 | 5,926.9 | 14,645.6 | 1.4% | 13.5 |
| 9801 | Perennial Stream Channel (Open Water) | 146 | 135.6 | 335.0 | 0.0% | 2.3 |
| 1431 | Phragmites australis – Arundo donax Semi-natural Stands | 92 | 820.4 | 2,027.3 | 0.2% | 22.0 |
| 3411 | Phragmites australis ssp. americanus Association (formerly Alliance) | 1 | 0.1 | 0.1 | 0.0% | 0.1 |
| 1213 | Pinus jeffreyi Alliance | 91 | 141.2 | 348.9 | 0.0% | 3.8 |
| 1311 | Pinus monophylla Alliance | 1,295 | 778.5 | 1,923.6 | 0.2% | 1.5 |
| 1121 | Pinus sabiniana Alliance | 140 | 15,151.8 | 37,440.9 | 3.7% | 267.4 |
| 1414 | Platanus racemosa Alliance | 5 | 334.6 | 826.8 | 0.1% | 165.4 |
| 4122 | Pleuraphis rigida Alliance | 8 | 3.3 | 8.3 | 0.0% | 1.0 |
| 4221 | Pluchea sericea Alliance | 159 | 115.4 | 285.1 | 0.0% | 1.8 |
| 1411 | Populus fremontii – Fraxinus velutina – Salix gooddingii Alliance | 235 | 606.0 | 1,497.4 | 0.1% | 6.4 |
| 1512 | Populus trichocarpa Alliance | 15 | 344.0 | 849.9 | 0.1% | 56.7 |
| 4222 | Prosopis glandulosa – Prosopis velutina – Prosopis pubescens Alliance | 383 | 17.6 | 43.5 | 0.0% | 0.1 |

**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.) |
|---|---|---|---|---|---|---|
| 7212 | Prunus fasciculata – Salazaria mexicana Alliance | 190 | 944.8 | 2,334.8 | 0.2% | 12.3 |
| 4219 | Psorothamnus fremontii – Psorothamnus polydenius Alliance | 37 | 506.2 | 1,250.7 | 0.1% | 33.8 |
| 4225 | Psorothamnus spinosus Sub-alliance | 100 | 2,763.7 | 6,829.3 | 0.7% | 68.3 |
| 5422 | Purshia tridentata – Artemisia tridentata Alliance | 66 | 659.0 | 1,628.3 | 0.2% | 24.7 |
| 1113 | Quercus chrysolepis Alliance | 844 | 1,862.8 | 4,603.2 | 0.5% | 5.5 |
| 1111 | Quercus douglasii Alliance | 691 | 4,363.5 | 10,782.4 | 1.1% | 15.6 |
| 3312 | Quercus john-tuckeri Alliance | 620 | 9,999.9 | 24,710.3 | 2.4% | 39.9 |
| 1118 | Quercus kelloggii Forest Alliance | 89 | 6,502.7 | 16,068.4 | 1.6% | 180.5 |
| 1112 | Quercus lobata Alliance | 15 | 416.2 | 1,028.4 | 0.1% | 68.6 |
| 1114 | Quercus wislizeni Alliance | 718 | 25.9 | 64.0 | 0.0% | 0.1 |
| 9400 | Restoration | 16 | 3,890.3 | 9,613.1 | 0.9% | 600.8 |
| 1425 | Rhus trilobata - Crataegus rivularis - Forestiera pubescens Alliance | 271 | 10,355.0 | 25,587.7 | 2.5% | 94.4 |
| 3211 | Ribes quercetorum Provisional Alliance | 29 | 9.9 | 24.6 | 0.0% | 0.8 |
| 1424 | Salix exigua Alliance | 341 | 239.7 | 592.4 | 0.1% | 1.7 |
| 1416 | Salix gooddingii – Salix laevigata Alliance | 695 | 440.3 | 1,088.1 | 0.1% | 1.6 |
| 1427 | Salix lasiolepis Alliance | 254 | 186.8 | 461.7 | 0.0% | 1.8 |
| 5511 | Sarcobatus vermiculatus Alliance | 600 | 20,267.2 | 50,081.5 | 4.9% | 83.5 |
| 3412 | Schoenoplectus (acutus, californicus) Alliance | 465 | 805.7 | 1,990.8 | 0.2% | 4.3 |
| 9803 | Small Earthen-dammed Ponds and Naturally Occurring Lakes | 8 | 2.4 | 5.8 | 0.0% | 0.7 |
| 3710 | Southwestern North America alkali marsh/seep vegetation Group | 1 | 5.4 | 13.3 | 0.0% | 13.3 |
| 1410 | Southwestern North American riparian evergreen and deciduous woodland Group | 8 | 34.3 | 84.7 | 0.0% | 10.6 |
| 1420 | Southwestern North American riparian wash/scrub Group | 1 | 0.9 | 2.3 | 0.0% | 2.3 |
| 6116 | Sparsely vegetated playa Mapping Unit | 602 | 13,847.5 | 34,218.0 | 3.4% | 56.8 |

**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.) |
|---|---|---|---|---|---|---|
| 9701 | Sparsely Vegetated Recently Burned Areas | 43 | 1,482.0 | 3,662.2 | 0.4% | 85.2 |
| 3712 | Sporobolus airoides – Muhlenbergia asperifolia – Spartina gracilis Alliance | 957 | 3,744.3 | 9,252.5 | 0.9% | 9.7 |
| 7411 | Suaeda moquinii – Isocoma acradenia Alliance | 59 | 1,219.3 | 3,012.9 | 0.3% | 51.1 |
| 3725 | Suaeda moquinii Mapping Unit | 26 | 253.1 | 625.5 | 0.1% | 24.1 |
| 1432 | Tamarix spp. Semi-natural Stands | 806 | 4,106.3 | 10,146.9 | 1.0% | 12.6 |
| 3415 | Typha (angustifolia, domingensis, latifolia) Mapping Unit | 2 | 3.5 | 8.8 | 0.0% | 4.4 |
| 3416 | Typha (angustifolia, domingensis, latifolia) Alliance | 429 | 599.8 | 1,482.2 | 0.1% | 3.5 |
| 6114 | Unvegetated wash and river bottom Mapping Unit | 285 | 1,382.4 | 3,416.0 | 0.3% | 12.0 |
| 3110 | Vancouverian and Rocky Mountain naturalized annual grassland Group | 194 | 768.1 | 1,897.9 | 0.2% | 9.8 |
| 3700 | Warm Semi-Desert/Mediterranean Alkali-Saline Wetland Macrogroup | 18 | 926.7 | 2,290.0 | 0.2% | 127.2 |
| 9800 | Water | 279 | 1,547.4 | 3,823.7 | 0.4% | 13.7 |
| 9805 | Water Impoundment Feature | 18 | 254.6 | 629.2 | 0.1% | 35.0 |
| 9210 | Woody Agriculture (orchards, vineyards) | 9 | 111.1 | 274.6 | 0.0% | 30.5 |
| 5423 | Yucca brevifolia Alliance | 81 | 995.5 | 2,460.0 | 0.2% | 30.4 |
| | **Totals** | 29,327 | 411,431.0 | 1,016,668.1 | 100.0% | 34.7 |

**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 | 878 | 51,472.8 | 127,192.0 | 12.5% | 144.9 |
| 4119 | Larrea tridentata Alliance | 1,058 | 39,786.0 | 98,313.3 | 9.7% | 92.9 |
| 5419 | Ephedra nevadensis - Lycium andersonii - Grayia spinosa Alliance | 582 | 29,713.5 | 73,423.7 | 7.2% | 126.2 |
| 4118 | Larrea tridentata – Encelia farinosa Alliance | 305 | 26,240.6 | 64,841.9 | 6.4% | 212.6 |
| 5511 | Sarcobatus vermiculatus Alliance | 600 | 20,267.2 | 50,081.5 | 4.9% | 83.5 |
| 6117 | Chorizanthe rigida – Geraea canescens Desert Pavement Sparsely Vegetated Alliance | 865 | 19,364.0 | 47,849.4 | 4.7% | 55.3 |
| 1311 | Pinus monophylla Alliance | 1,295 | 15,151.8 | 37,440.9 | 3.7% | 28.9 |
| 6116 | Sparsely vegetated playa Mapping Unit | 602 | 13,847.5 | 34,218.0 | 3.4% | 56.8 |
| 4113 | Atriplex polycarpa Alliance | 393 | 11,983.1 | 29,610.9 | 2.9% | 75.3 |
| 1122 | Juniperus californica Alliance | 1,364 | 11,932.3 | 29,485.4 | 2.9% | 21.6 |
| 9400 | Restoration | 16 | 10,355.0 | 25,587.7 | 2.5% | 1,599.2 |
| 1111 | Quercus douglasii Alliance | 691 | 9,999.9 | 24,710.3 | 2.4% | 35.8 |
| 4111 | Ambrosia dumosa Alliance | 252 | 8,774.0 | 21,680.9 | 2.1% | 86.0 |
| 6113 | Mud Hills sparsely vegetated ephemeral herbs Mapping Unit | 239 | 8,225.0 | 20,324.4 | 2.0% | 85.0 |
| 2221 | Eriogonum fasciculatum – (Viguiera parishii) Alliance | 530 | 7,777.8 | 19,219.3 | 1.9% | 36.3 |
| 4114 | Encelia farinosa Alliance | 282 | 7,528.4 | 18,603.0 | 1.8% | 66.0 |
| 5421 | Coleogyne ramosissima Alliance | 318 | 7,329.2 | 18,110.9 | 1.8% | 57.0 |
| 5112 | Atriplex confertifolia Alliance | 206 | 7,185.3 | 17,755.4 | 1.7% | 86.2 |
| 3312 | Quercus john-tuckeri Alliance | 620 | 6,502.7 | 16,068.4 | 1.6% | 25.9 |
| 4227 | Parkinsonia florida – Olneya tesota Alliance | 1,086 | 5,926.9 | 14,645.6 | 1.4% | 13.5 |
| 9220 | Non-woody Row and Field Agriculture | 27 | 5,607.5 | 13,856.4 | 1.4% | 513.2 |

**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.) |
|---|---|---|---|---|---|---|
| 5217 | Ericameria nauseosa – Atriplex lentiformis Mapping Unit | 675 | 5,432.0 | 13,422.7 | 1.3% | 19.9 |
| 9300 | Built-up & Urban Disturbance | 735 | 4,653.4 | 11,498.8 | 1.1% | 15.6 |
| 1113 | Quercus chrysolepis Alliance | 844 | 4,363.5 | 10,782.4 | 1.1% | 12.8 |
| 1432 | Tamarix spp. Semi-natural Stands | 806 | 4,106.3 | 10,146.9 | 1.0% | 12.6 |
| 1114 | Quercus wislizeni Alliance | 718 | 3,890.3 | 9,613.1 | 0.9% | 13.4 |
| 3712 | Sporobolus airoides – Muhlenbergia asperifolia – Spartina gracilis Alliance | 957 | 3,744.3 | 9,252.5 | 0.9% | 9.7 |
| 6110 | North American warm desert bedrock cliff and outcrop Group | 281 | 3,576.7 | 8,838.3 | 0.9% | 31.5 |
| 5212 | Ericameria nauseosa Alliance | 499 | 3,395.7 | 8,391.0 | 0.8% | 16.8 |
| 5311 | Artemisia tridentata Alliance | 551 | 3,319.3 | 8,202.2 | 0.8% | 14.9 |
| 3726 | Distichlis spicata Alliance | 864 | 3,266.5 | 8,071.6 | 0.8% | 9.3 |
| 5111 | Atriplex canescens Alliance | 165 | 3,097.8 | 7,654.7 | 0.8% | 46.4 |
| 4219 | Psorothamnus fremontii – Psorothamnus polydenius Alliance | 37 | 2,763.7 | 6,829.3 | 0.7% | 184.6 |
| 2305 | California annual and perennial grassland (Native component) Mapping Unit | 415 | 2,498.9 | 6,175.0 | 0.6% | 14.9 |
| 6121 | Dicoria canescens – Abronia villosa - Panicum urvilleanum Alliance | 92 | 2,032.1 | 5,021.4 | 0.5% | 54.6 |
| 5422 | Purshia tridentata – Artemisia tridentata Alliance | 66 | 1,862.8 | 4,603.2 | 0.5% | 69.7 |
| 2226 | Eriogonum fasciculatum Alliance | 706 | 1,808.8 | 4,469.7 | 0.4% | 6.3 |
| 9800 | Water | 279 | 1,547.4 | 3,823.7 | 0.4% | 13.7 |
| 9701 | Sparsely Vegetated Recently Burned Areas | 43 | 1,482.0 | 3,662.2 | 0.4% | 85.2 |
| 9320 | Anthropogenic Areas of Little or No Vegetation | 226 | 1,398.7 | 3,456.4 | 0.3% | 15.3 |
| 6114 | Unvegetated wash and river bottom Mapping Unit | 285 | 1,382.4 | 3,416.0 | 0.3% | 12.0 |
| 7411 | Suaeda moquinii – Isocoma acradenia Alliance | 59 | 1,219.3 | 3,012.9 | 0.3% | 51.1 |
| 2131 | Cercocarpus montanus Alliance | 275 | 1,097.5 | 2,711.9 | 0.3% | 9.9 |

**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.) |
|---|---|---|---|---|---|---|
| 2116 | Ceanothus cuneatus Alliance | 446 | 999.3 | 2,469.4 | 0.2% | 5.5 |
| 5423 | Yucca brevifolia Alliance | 81 | 995.5 | 2,460.0 | 0.2% | 30.4 |
| 4216 | Ambrosia salsola Mapping Unit | 73 | 966.5 | 2,388.3 | 0.2% | 32.7 |
| 7211 | Ambrosia salsola – Bebbia juncea Alliance | 104 | 962.9 | 2,379.5 | 0.2% | 22.9 |
| 9230 | Irrigated Pastures | 38 | 960.7 | 2,374.1 | 0.2% | 62.5 |
| 4222 | Prosopis glandulosa – Prosopis velutina – Prosopis pubescens Alliance | 383 | 944.8 | 2,334.8 | 0.2% | 6.1 |
| 3700 | Warm Semi-Desert/Mediterranean Alkali-Saline Wetland Macrogroup | 18 | 926.7 | 2,290.0 | 0.2% | 127.2 |
| 5417 | Ephedra viridis Alliance | 232 | 914.1 | 2,258.8 | 0.2% | 9.7 |
| 6115 | Massive sparsely vegetated rock outcrop Mapping Unit | 86 | 892.2 | 2,204.6 | 0.2% | 25.6 |
| 2330 | Mediterranean California naturalized annual and perennial grassland Group | 63 | 839.7 | 2,074.9 | 0.2% | 32.9 |
| 9801 | Perennial Stream Channel (Open Water) | 146 | 820.4 | 2,027.3 | 0.2% | 13.9 |
| 3412 | Schoenoplectus (acutus, californicus) Alliance | 465 | 805.7 | 1,990.8 | 0.2% | 4.3 |
| 1213 | Pinus jeffreyi Alliance | 91 | 778.5 | 1,923.6 | 0.2% | 21.1 |
| 3110 | Vancouverian and Rocky Mountain naturalized annual grassland Group | 194 | 768.1 | 1,897.9 | 0.2% | 9.8 |
| 3722 | Atriplex lentiformis Alliance | 146 | 766.0 | 1,892.8 | 0.2% | 13.0 |
| 2222 | Eriogonum wrightii – Eriogonum heermannii – Buddleja utahensis Alliance | 234 | 664.2 | 1,641.4 | 0.2% | 7.0 |
| 6120 | North American warm desert dunes and sand flats Group | 21 | 661.9 | 1,635.7 | 0.2% | 77.9 |
| 4225 | Psorothamnus spinosus Sub-alliance | 100 | 659.0 | 1,628.3 | 0.2% | 16.3 |
| 4221 | Pluchea sericea Alliance | 159 | 606.0 | 1,497.4 | 0.1% | 9.4 |
| 3416 | Typha (angustifolia, domingensis, latifolia) Alliance | 429 | 599.8 | 1,482.2 | 0.1% | 3.5 |
| 7212 | Prunus fasciculata – Salazaria mexicana Alliance | 190 | 506.2 | 1,250.7 | 0.1% | 6.6 |
| 4212 | Lepidospartum squamatum Alliance | 77 | 485.8 | 1,200.3 | 0.1% | 15.6 |
| 9804 | Major Canals and Aqueducts (Open Water) | 17 | 470.4 | 1,162.3 | 0.1% | 68.4 |

**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.) |
|---|---|---|---|---|---|---|
| 1416 | Salix gooddingii – Salix laevigata Alliance | 695 | 440.3 | 1,088.1 | 0.1% | 1.6 |
| 3316 | Ceanothus greggii – Fremontodendron californicum Alliance | 55 | 429.6 | 1,061.6 | 0.1% | 19.3 |
| 1118 | Quercus kelloggii Forest Alliance | 89 | 416.2 | 1,028.4 | 0.1% | 11.6 |
| 2117 | Arctostaphylos viscida Alliance | 140 | 359.1 | 887.3 | 0.1% | 6.3 |
| 1411 | Populus fremontii – Fraxinus velutina – Salix gooddingii Alliance | 235 | 344.0 | 849.9 | 0.1% | 3.6 |
| 3410 | Arid West freshwater emergent marsh Group | 117 | 342.6 | 846.5 | 0.1% | 7.2 |
| 1121 | Pinus sabiniana Alliance | 140 | 334.6 | 826.8 | 0.1% | 5.9 |
| 3611 | Juncus arcticus (var. balticus, mexicanus) Alliance | 448 | 270.4 | 668.3 | 0.1% | 1.5 |
| 9805 | Water Impoundment Feature | 18 | 254.6 | 629.2 | 0.1% | 35.0 |
| 3725 | Suaeda moquinii Mapping Unit | 26 | 253.1 | 625.5 | 0.1% | 24.1 |
| 1424 | Salix exigua Alliance | 341 | 239.7 | 592.4 | 0.1% | 1.7 |
| 1427 | Salix lasiolepis Alliance | 254 | 186.8 | 461.7 | 0.0% | 1.8 |
| 6111 | Atriplex hymenelytra Alliance | 19 | 164.6 | 406.6 | 0.0% | 21.4 |
| 3728 | Isocoma acradenia Association (formerly Alliance) | 19 | 153.1 | 378.4 | 0.0% | 19.9 |
| 1431 | Phragmites australis – Arundo donax Semi-natural Stands | 92 | 141.2 | 348.9 | 0.0% | 3.8 |
| 4152 | Carnegiea gigantea - Parkinsonia microphylla - Prosopis velutina Alliance | 8 | 135.6 | 335.0 | 0.0% | 41.9 |
| 5416 | Ericameria teretifolia Alliance | 32 | 128.1 | 316.6 | 0.0% | 9.9 |
| 1425 | Rhus trilobata - Crataegus rivularis - Forestiera pubescens Alliance | 271 | 126.0 | 311.4 | 0.0% | 1.1 |
| 9200 | Agriculture | 19 | 119.4 | 295.1 | 0.0% | 15.5 |
| 1521 | Betula occidentalis Alliance | 77 | 118.6 | 293.0 | 0.0% | 3.8 |
| 4122 | Pleuraphis rigida Alliance | 8 | 115.4 | 285.1 | 0.0% | 35.6 |
| 9210 | Woody Agriculture (orchards, vineyards) | 9 | 111.1 | 274.6 | 0.0% | 30.5 |
| 1422 | Baccharis salicifolia Alliance | 89 | 108.4 | 267.9 | 0.0% | 3.0 |

**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.) |
|---|---|---|---|---|---|---|
| 4226 | Acacia greggii – Hyptis emoryi – Justicia californica Alliance | 24 | 105.0 | 259.4 | 0.0% | 10.8 |
| 7222 | Chilopsis linearis – Psorothamnus spinosus Alliance | 56 | 100.0 | 247.0 | 0.0% | 4.4 |
| 3715 | Bolboschoenus maritimus, Schoenoplectus americanus Mapping Unit | 40 | 99.8 | 246.5 | 0.0% | 6.2 |
| 3721 | Allenrolfea occidentalis Alliance | 15 | 86.5 | 213.9 | 0.0% | 14.3 |
| 1212 | Abies concolor Alliance | 20 | 82.8 | 204.5 | 0.0% | 10.2 |
| 5211 | Encelia (actoni, virginensis) – Viguiera reticulata Alliance | 5 | 78.3 | 193.4 | 0.0% | 38.7 |
| 3713 | Anemopsis californica – Helianthus nuttallii – Solidago spectabilis Alliance | 64 | 73.9 | 182.7 | 0.0% | 2.9 |
| 1611 | Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia Semi-natural Alliance | 56 | 71.8 | 177.5 | 0.0% | 3.2 |
| 9500 | Exotic Trees | 12 | 60.9 | 150.5 | 0.0% | 12.5 |
| 4213 | Ericameria paniculata Alliance | 19 | 59.2 | 146.2 | 0.0% | 7.7 |
| 2123 | Ceanothus oliganthus – Ceanothus leucodermis Alliance | 13 | 53.0 | 131.0 | 0.0% | 10.1 |
| 1116 | Aesculus californica Alliance | 29 | 49.3 | 121.9 | 0.0% | 4.2 |
| 2310 | California annual forb/grass vegetation Group | 1 | 47.2 | 116.6 | 0.0% | 116.6 |
| 1423 | Baccharis emoryi – Baccharis sergiloides Alliance | 51 | 38.2 | 94.3 | 0.0% | 1.8 |
| 4124 | Cylindropuntia bigelovii Alliance | 3 | 37.7 | 93.1 | 0.0% | 31.0 |
| 1410 | Southwestern North American riparian evergreen and deciduous woodland Group | 8 | 34.3 | 84.7 | 0.0% | 10.6 |
| 4229 | Castela emoryi Special Stands | 1 | 31.5 | 77.8 | 0.0% | 77.8 |
| 1112 | Quercus lobata Alliance | 15 | 25.9 | 64.0 | 0.0% | 4.3 |
| 2214 | Ericameria linearifolia – Cleome isomeris Alliance | 17 | 19.2 | 47.5 | 0.0% | 2.8 |
| 1512 | Populus trichocarpa Alliance | 15 | 17.6 | 43.5 | 0.0% | 2.9 |
| 3211 | Ribes quercetorum Provisional Alliance | 29 | 9.9 | 24.6 | 0.0% | 0.8 |
| 1522 | Cornus sericea – Rosa woodsii – Ribes spp. Alliance | 16 | 9.0 | 22.2 | 0.0% | 1.4 |

**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.) |
|---|---|---|---|---|---|---|
| 5431 | Achnatherum speciosum Alliance | 3 | 8.2 | 20.2 | 0.0% | 6.7 |
| 2111 | Arctostaphylos glauca Alliance | 3 | 5.6 | 13.7 | 0.0% | 4.6 |
| 3710 | Southwestern North America alkali marsh/seep vegetation Group | 1 | 5.4 | 13.3 | 0.0% | 13.3 |
| 3212 | Ceanothus cordulatus – Ceanothus integerrimus Alliance | 5 | 5.2 | 12.8 | 0.0% | 2.6 |
| 3415 | Typha (angustifolia, domingensis, latifolia) Mapping Unit | 2 | 3.5 | 8.8 | 0.0% | 4.4 |
| 1414 | Platanus racemosa Alliance | 5 | 3.3 | 8.3 | 0.0% | 1.7 |
| 4110 | Lower bajada and fan Mojavean-Sonoran desert scrub Group | 1 | 3.0 | 7.4 | 0.0% | 7.4 |
| 2217 | Corethrogyne filaginifolia – Eriogonum (elongatum, nudum) Alliance | 3 | 2.6 | 6.3 | 0.0% | 2.1 |
| 9803 | Small Earthen-dammed Ponds and Naturally Occurring Lakes | 8 | 2.4 | 5.8 | 0.0% | 0.7 |
| 5441 | Cercocarpus ledifolius Alliance | 1 | 1.5 | 3.6 | 0.0% | 3.6 |
| 1420 | Southwestern North American riparian wash/scrub Group | 1 | 0.9 | 2.3 | 0.0% | 2.3 |
| 2331 | Brassica tournefortii – Malcolmia africana Semi-natural Stands | 1 | 0.8 | 2.0 | 0.0% | 2.0 |
| 4211 | Ephedra californica Alliance | 1 | 0.7 | 1.6 | 0.0% | 1.6 |
| 3510 | Californian mixed annual/perennial freshwater vernal pool/swale/plain bottomland Group | 1 | 0.2 | 0.4 | 0.0% | 0.4 |
| 3411 | Phragmites australis ssp. americanus Association (formerly Alliance) | 1 | 0.1 | 0.1 | 0.0% | 0.1 |
| **Totals** | | **29,327** | **411,431.0** | **1,016,668.1** | **100.0%** | **34.7** |

# 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 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.

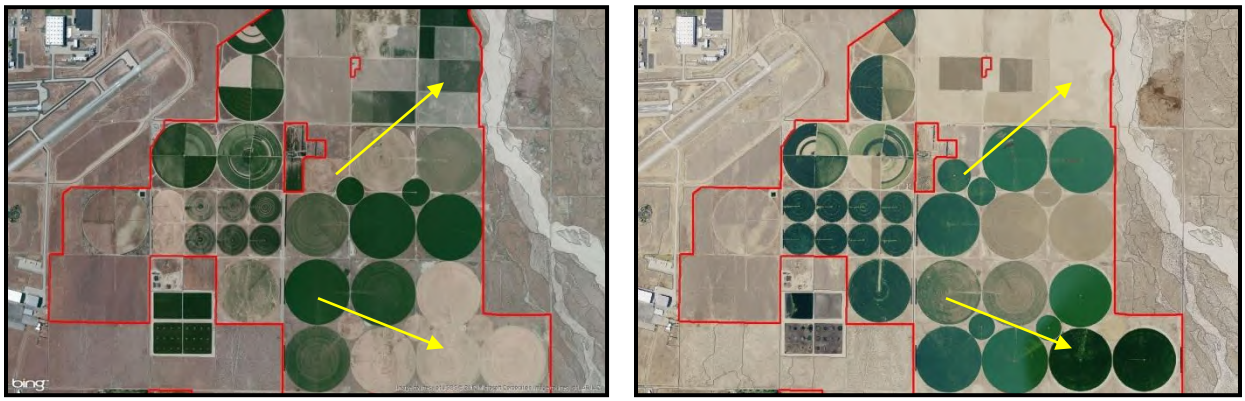
To account for the ambiguity of agricultural signatures due to land rotating in and out of agricultural activity, land that had been in crop production at any time within 5 years of the current base imagery is mapped as agriculture for the project. The agriculture polygon boundary was drawn to the largest 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.

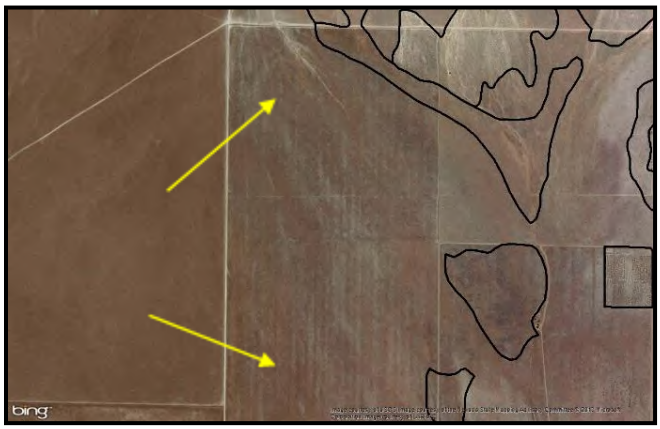
**Example 2 – Annual and Bi-annual Crop Rotation**



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 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 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 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 photointerpret. 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:**

**UID:**

**Location Name:**

**GPS Name** _____ **Projected? No / Yes / Base / Digitized**

If Yes, enter: **Bearing (°):** _____ **Distance (m):** _____ **Inclination (°):** _____

If Yes or Digitized, enter: **Base Waypoint ID**: _____

**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:**

**UID:**

**Location Name:**

**GPS Name** _____ **Projected? No / Yes / Base / Digitized**

If Yes, enter: **Bearing (°):** _____ **Distance (m):** _____ **Inclination (°):** _____

If Yes or Digitized, enter: **Base Waypoint ID**: _____

**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 |
|---|---|---|---|---|---|---|---|---|---|---|
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## Field Verification Form: DRECP Vegetation Mapping (11/01/18)

| | | |
|---|---|---|
| **Surveyors** (circle recorder): | | **Date:** |
| **Location name:** | | |
| **Base Waypoint ID:** | **GPS name:** **Projected?** Yes / No / Base **Error**: +/- m<br>**Bearing:** _____ **(degrees)** **Distance:** _____ **(meters)** **Inclination:**_____ **(degrees)** | |
| **Polygon UID:** | LAT__ __ . __ __ __ __ __ __ __ __ LONG -__ __ __ . __ __ __ __ __ __ __ __ | |

| Strata | Species | % cover | C | Strata | Species | % cover | C |
|---|---|---|---|---|---|---|---|
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| | |
|---|---|
| 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? _____ |

# 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* (Organillo – 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 goodingii* 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 pseudoacaia* 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* stands…
**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 thatdrains 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 codominates 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 = *Coreothrogyne filaginifolia - Eriogonum* (elongatum, nudum) (Sand-aster - Perennial buckwheat fields) Alliance**
**Including the 2219 = *Lupinus excubitus - Menzelia albicaulis - Eriogonum* spp. (Grape sode 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 heermanii, 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. intemedia, 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 - Menzelia* 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 - Malcomia 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 - Taeniantherum 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 Macrogoup 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 vesitus, 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 Macrogoup 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 Macrogoup 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, Nasturium 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 vemiculatus* 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 *Krascheninnikovia 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 *Krascheninnikovia 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 hymenyltra, 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. pubecens*, *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. pubscens* 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 *Suaeda 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 *Sueada 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 salsolia, 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* (*sensu lato*) ≥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 - VEGETATION DESCRIPTION

Table of Contents..... Page #

## TREE-OVERSTORY VEGETATION

## *Aesculus californica* Woodland Alliance

**Common Name:** California buckeye groves

**NVC Alliance Code:** A4125. *Aesculus californica* Woodland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Aesculus californica* | 1 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: 1258 m
Slope: 37°
Aspect: Northeast-facing

Tree Cover: 27%
Shrub Cover: 7%
Herb Cover: 20%

**Surface Covers:**
Large Rock: 2%
Small Rock: 15%
Fines: 60%
Litter: 20%

**Conservation Status Rank: Global** G3; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **1** | | | | | | | |

**Surveys Used in Description (N = 1):** JAWB0027

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Aesculus californica* | 100 | 83.9 | 24.0 | 24.0 | 24.0 | **x** | **x** | | **x** |
| | *Quercus chrysolepis* | 100 | 7.7 | 2.2 | 2.2 | 2.2 | **x** | | | **x** |
| | *Pinus sabiniana* | 100 | 7.7 | 2.2 | 2.2 | 2.2 | **x** | | | **x** |
| | *Pinus monophylla* | 100 | 0.7 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| **Shrub** | | | | | | | | | | |
| | *Artemisia tridentata* | 100 | 85.7 | 6.0 | 6.0 | 6.0 | **x** | **x** | | **x** |
| | *Cercocarpus montanus* var. *glaber* | 100 | 14.3 | 1.0 | 1.0 | 1.0 | **x** | | | **x** |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus diandrus* | 100 | 52.1 | 10.0 | 10.0 | 10.0 | **x** | **x** | | **x** |
| | *Poa secunda* | 100 | 36.5 | 7.0 | 7.0 | 7.0 | **x** | | **x** | **x** |
| | *Clarkia cylindrica* | 100 | 5.2 | 1.0 | 1.0 | 1.0 | **x** | | | **x** |
| | *Erysimum capitatum* | 100 | 1.0 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Eriogonum nudum* | 100 | 1.0 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Collinsia heterophylla* | 100 | 1.0 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Phacelia tanacetifolia* | 100 | 1.0 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Madia elegans* ssp. *vernalis* | 100 | 1.0 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Gilia capitata* | 100 | 1.0 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 100 | 50.0 | 1.0 | 1.0 | 1.0 | **x** | **x** | | **x** |
| | Moss | 100 | 50.0 | 1.0 | 1.0 | 1.0 | **x** | **x** | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Eucalyptus* spp. – *Ailanthus altissima – Robinia pseudoacacia* Woodland Alliance

**Common Name:** Eucalyptus – tree of heaven – black locust groves

**NVC Alliance Code:** A0084. *Eucalyptus* spp. Ruderal Forest Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Ailanthus altissima* | 1 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: 1166 m
Slope: no data
Aspect: no data

Tree Cover: 41%
Shrub Cover: 15%
Herb Cover: 30%

**Surface Covers:**
Large Rock: no data
Small Rock: no data
Fines: no data
Litter: no data

### Conservation Status Rank: **Global** GNA; **State (California)** SNA

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | | | | | | | | |

### Surveys Used in Description (N = 1): F1806041306

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Ailanthus altissima* | 100 | 99.5 | 40.0 | 40.0 | 40.0 | x | x | | x |
| | *Yucca brevifolia* | 100 | 0.5 | 0.2 | 0.2 | 0.2 | x | | | x |
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 100 | 95.2 | 12.0 | 12.0 | 12.0 | x | x | | x |
| | *Lycium cooperi* | 100 | 1.6 | 0.2 | 0.2 | 0.2 | x | | | x |
| | *Hymenoclea salsola* | 100 | 1.6 | 0.2 | 0.2 | 0.2 | x | | | x |
| | *Encelia actonii* | 100 | 1.6 | 0.2 | 0.2 | 0.2 | x | | | x |
| **Herb** | | | | | | | | | | |
| | *Schismus* | 100 | 47.5 | 15.0 | 15.0 | 15.0 | x | | x | x |
| | *Bromus rubens* | 100 | 47.5 | 15.0 | 15.0 | 15.0 | x | | x | x |
| | *Bromus tectorum* | 100 | 3.2 | 1.0 | 1.0 | 1.0 | x | | | x |
| | *Stanleya* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | x | | | x |
| | *Senecio flaccidus* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | x | | | x |
| | *Chamaesyce* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | x | | | x |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Juniperus californica* Woodland Alliance

**Common Name:** California juniper woodland

**NVC Alliance Code:** A0502. *Juniperus californica* Mojave Scrub Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Juniperus californica* / *Ericameria linearifolia* / annual – perennial herb | 3 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

**Plot/Sample Data Summary:**

Elevation: Mean 1090 m, Range 963 – 1259 m
Slope: Mean 25°, Range 10 – 36°
Aspect: Variable

Tree Cover: Mean 10.5%, Range 3 – 23%
Shrub Cover: Mean 11.0%, Range 9 – 15%
Herb Cover: Mean 11.7%, Range 3 – 26%

**Surface Covers:**
Large Rock: Mean 22.0%, Range 3.0 –35%
Small Rock: Mean 46.0%, Range 20 – 60%
Fines: Mean 24.7%, Range 0 – 62%
Litter: Mean 6.0%, Range 1 – 12%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **3** | | | | | | | |

**Surveys Used in Description (N = 3):** JAWB0034, JAWB0106, JAWB0117

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Juniperus californica* | 100 | 87.0 | 10.1 | 3.0 | 22.2 | **x** | **x** | | **x** |
| | Standing snag | 33 | 9.5 | 0.7 | 2.0 | 2.0 | | | | |
| | *Pinus sabiniana* | 33 | 1.4 | 0.3 | 1.0 | 1.0 | | | | |
| | *Yucca brevifolia* | 33 | 2.1 | 0.1 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Eriogonum fasciculatum* | 100 | 26.9 | 2.7 | 1.0 | 4.0 | **x** | | | **x** |
| | *Hesperoyucca whipplei* | 100 | 18.8 | 1.7 | 0.2 | 4.0 | **x** | | | **x** |
| | *Prunus fasciculata* | 67 | 14.2 | 2.1 | 0.2 | 6.0 | | | | **x** |
| | *Ericameria linearifolia* | 67 | 14.8 | 1.3 | 1.0 | 3.0 | | | | **x** |
| | *Ericameria teretifolia* | 67 | 5.3 | 0.7 | 0.2 | 2.0 | | | | **x** |
| | *Ericameria cuneata* | 67 | 3.1 | 0.4 | 0.2 | 1.0 | | | | **x** |
| | *Opuntia basilaris* | 67 | 1.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Ephedra nevadensis* | 33 | 4.4 | 0.7 | 2.0 | 2.0 | | | | |
| | *Quercus john-tuckeri* | 33 | 3.5 | 0.3 | 1.0 | 1.0 | | | | |
| | *Eriogonum wrightii* | 33 | 4.2 | 0.3 | 1.0 | 1.0 | | | | |
| | *Atriplex canescens* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Salvia dorrii* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bebbia juncea* | 33 | 0.8 | 0.1 | 0.2 | 0.2 | | | | |
| | *Coleogyne ramosissima* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Ephedra viridis* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Ceanothus cuneatus* | 33 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 67 | 43.5 | 6.3 | 4.0 | 15.0 | | | | **x** |
| | *Poa secunda* | 67 | 14.0 | 3.4 | 0.2 | 10.0 | | | | **x** |
| | *Schismus* | 67 | 7.7 | 0.4 | 0.2 | 1.0 | | | | **x** |
| | *Amsinckia* | 67 | 1.8 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Achnatherum speciosum* | 67 | 1.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Bromus madritensis* | 33 | 22.7 | 1.0 | 3.0 | 3.0 | | | | |
| | *Bromus tectorum* | 33 | 1.3 | 0.3 | 1.0 | 1.0 | | | | |
| | *Chaenactis xantiana* | 33 | 1.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Melica imperfecta* | 33 | 1.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriophyllum* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum nudum* | 33 | 1.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Emmenanthe penduliflora* | 33 | 1.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Apiastrum angustifolium* | 33 | 1.5 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 67 | 66.7 | 2.3 | 1.0 | 6.0 | | | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Pinus jeffreyi* Forest Alliance

**Common Name:** Jeffrey pine forest

**NVC Alliance Code:** A3676. *Pinus jeffreyi - Pinus ponderosa* var. *washoensis* Mixed Conifer Woodland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Pinus jeffreyi – Quercus kelloggii* | 1 | |
| *Pinus jeffreyi / Arctostaphylos patula* | 4 | CEGL008627 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 2383 m, Range 1842 – 2780 m
Slope: Mean 16°, Range 11 – 26°
Aspect: Variable

Tree Cover: Mean 36.8%, Range 18 – 55%
Shrub Cover: Mean 18.2%, Range 0 – 45%
Herb Cover: Mean 6.3%, Range 0 – 17%

**Surface Covers:**
Large Rock: Mean 12.8%, Range 0.1 –40%
Small Rock: Mean 10.9%, Range 0 – 30%
Fines: Mean 39.8%, Range 0 – 80%
Litter: Mean 24.0%, Range 0 – 90%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **2** | **3** | | | | | | |

**Surveys Used in Description (N = 5):** D07121215, JAWB0211, SLTN0314, SLTN0389, SLTN0701

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus jeffreyi* | 100 | 81.2 | 30.7 | 16.1 | 55.0 | **x** | **x** | | **x** |
| | *Quercus kelloggii* | 40 | 4.7 | 1.8 | 0.2 | 9.0 | | | | |
| | *Abies concolor* | 20 | 8.5 | 5.2 | 26.0 | 26.0 | | | | |
| | *Abies magnifica* | 20 | 4.0 | 0.8 | 4.0 | 4.0 | | | | |
| | *Quercus chrysolepis* | 20 | 1.3 | 0.2 | 1.2 | 1.2 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Arctostaphylos patula* | 80 | 42.0 | 8.8 | 4.0 | 20.0 | **x** | | **x** | **x** |
| | *Artemisia tridentata* | 80 | 16.8 | 4.0 | 0.1 | 15.0 | **x** | | | **x** |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Tetradymia canescens* | 40 | 0.7 | 0.1 | 0.1 | 0.2 | | | | |
| | *Symphoricarpos rotundifolius* | 40 | 0.2 | 0.0 | 0.1 | 0.1 | | | | |
| | *Purshia glandulosa* | 20 | 4.4 | 2.0 | 10.0 | 10.0 | | | | |
| | *Chrysolepis sempervirens* | 20 | 9.6 | 1.4 | 7.0 | 7.0 | | | | |
| | *Ceanothus pinetorum* | 20 | 2.7 | 0.4 | 2.0 | 2.0 | | | | |
| | *Ceanothus velutinus* | 20 | 2.1 | 0.4 | 2.0 | 2.0 | | | | |
| | *Purshia tridentata* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Keckiella breviflora* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Ribes cereum* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Prunus emarginata* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Sambucus racemosa* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 40 | 14.5 | 1.2 | 2.0 | 4.0 | | | | |
| | *Elymus elymoides* | 40 | 10.2 | 0.8 | 0.1 | 4.0 | | | | |
| | *Leptosiphon nuttallii* | 40 | 19.0 | 0.6 | 1.0 | 2.0 | | | | |
| | *Erigeron breweri* | 40 | 2.8 | 0.1 | 0.1 | 0.2 | | | | |
| | *Arabis platysperma* | 40 | 2.5 | 0.0 | 0.1 | 0.1 | | | | |
| | Forb (herbaceous, not grass nor grasslike) | 40 | 1.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Carex rossii* | 40 | 1.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Gayophytum diffusum* | 40 | 2.5 | 0.0 | 0.1 | 0.1 | | | | |
| | *Bromus diandrus* | 20 | 14.1 | 2.4 | 12.0 | 12.0 | | | | |
| | *Elymus glaucus* | 20 | 3.5 | 0.6 | 3.0 | 3.0 | | | | |
| | *Achnatherum occidentale* | 20 | 4.7 | 0.4 | 2.0 | 2.0 | | | | |
| | *Poa cusickii* | 20 | 2.4 | 0.2 | 1.0 | 1.0 | | | | |
| | *Poa secunda* | 20 | 3.0 | 0.2 | 1.0 | 1.0 | | | | |
| | *Corethrogyne filaginifolia* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| | *Leymus triticoides* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| | *Eriogonum* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| | *Lupinus albicaulis* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| | *Achnatherum speciosum* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| | *Monardella linoides* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| | *Lotus* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| | *Frasera* | 20 | 0.2 | 0.0 | 0.1 | 0.1 | | | | |
| | *Apocynum androsaemifolium* | 20 | 2.2 | 0.0 | 0.1 | 0.1 | | | | |
| | *Eriogonum nudum* | 20 | 2.2 | 0.0 | 0.1 | 0.1 | | | | |
| | *Hieracium horridum* | 20 | 2.2 | 0.0 | 0.1 | 0.1 | | | | |
| | *Linanthus pungens* | 20 | 2.2 | 0.0 | 0.1 | 0.1 | | | | |
| | *Lupinus padre-crowleyi* | 20 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Penstemon rostriflorus* | 20 | 2.2 | 0.0 | 0.1 | 0.1 | | | | |
| | Fern or Fern Ally | 20 | 2.2 | 0.0 | 0.1 | 0.1 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 20 | 20.0 | 0.4 | 2.0 | 2.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Pinus jeffreyi – Quercus kelloggii* Association

**Common Name:** Jeffrey Pine - Black Oak Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: 1842 m
Slope: no data
Aspect: no data

Tree Cover: 40%
Shrub Cover: 0%
Herb Cover: 17%

**Surface Covers:**
Large Rock: no data
Small Rock: no data
Fines: no data
Litter: no data

**Surveys Used in Description (N = 1):** D07121215

**Association Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus jeffreyi* | 100 | 77.5 | 31.0 | 31.0 | 31.0 | **x** | **x** | | **x** |
| | *Quercus kelloggii* | 100 | 22.5 | 9.0 | 9.0 | 9.0 | **x** | | | **x** |
| **Herb** | | | | | | | | | | |
| | *Bromus diandrus* | 100 | 70.6 | 12.0 | 12.0 | 12.0 | **x** | **x** | | **x** |
| | *Elymus glaucus* | 100 | 17.6 | 3 | 3 | 3 | **x** | | | **x** |
| | *Bromus tectorum* | 100 | 11.8 | 2.0 | 2.0 | 2.0 | **x** | | | **x** |

## *Pinus jeffreyi / Arctostaphylos patula* Association

**Common Name:** Jeffrey Pine / Greenleaf Manzanita Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 2518 m, Range 2067 – 2780 m
Slope: Mean 16°, Range 11 – 26°
Aspect: Variable

Tree Cover: Mean 36.1%, Range 18 – 55%
Shrub Cover: Mean 22.8%, Range 8 – 45%
Herb Cover: Mean 3.6%, Range 0 – 7%

**Surface Covers:**
Large Rock: Mean 12.8%, Range 0.1 –40%
Small Rock: Mean 10.9%, Range 0 – 30%
Fines: Mean 39.8%, Range 0 – 80%
Litter: Mean 24.0%, Range 0 – 90%

**Surveys Used in Description (N = 4):** JAWB0211, SLTN0314, SLTN0389, SLTN0701

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus jeffreyi* | 100 | 82.2 | 30.6 | 16.1 | 55.0 | X | X | | X |
| | *Abies concolor* | 25 | 10.6 | 6.5 | 26.0 | 26.0 | | | | |
| | *Abies magnifica* | 25 | 5.0 | 1.0 | 4.0 | 4.0 | | | | |
| | *Quercus chrysolepis* | 25 | 1.7 | 0.3 | 1.2 | 1.2 | | | | |
| | *Quercus kelloggii* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Quercus wislizeni* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Arctostaphylos patula* | 100 | 52.5 | 11.0 | 4.0 | 20.0 | X | X | | X |
| | *Artemisia tridentata* | 100 | 21.0 | 5.0 | 0.1 | 15.0 | X | | | X |
| | *Tetradymia canescens* | 50 | 0.8 | 0.1 | 0.1 | 0.2 | | | | X |
| | *Symphoricarpos rotundifolius* | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Purshia glandulosa* | 25 | 5.6 | 2.5 | 10.0 | 10.0 | | | | |
| | *Chrysolepis sempervirens* | 25 | 12.0 | 1.8 | 7.0 | 7.0 | | | | |
| | *Ceanothus pinetorum* | 25 | 3.4 | 0.5 | 2.0 | 2.0 | | | | |
| | *Ceanothus velutinus* | 25 | 2.6 | 0.5 | 2.0 | 2.0 | | | | |
| | *Purshia tridentata* | 25 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Keckiella breviflora* | 25 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Ribes cereum* | 25 | 0.2 | 0.0 | 0.1 | 0.1 | | | | |
| | *Sambucus racemosa* | 25 | 0.2 | 0.0 | 0.1 | 0.1 | | | | |
| | *Prunus emarginata* | 25 | 0.2 | 0.0 | 0.1 | 0.1 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Elymus elymoides* | 50 | 12.8 | 1.0 | 0.1 | 4.0 | | | | X |
| | *Leptosiphon nuttallii* | 50 | 23.8 | 0.8 | 1.0 | 2.0 | | | | X |
| | *Erigeron breweri* | 50 | 3.5 | 0.1 | 0.1 | 0.2 | | | | X |
| | *Carex rossii* | 50 | 1.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | Forb (herbaceous, not grass nor grasslike) | 50 | 1.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Arabis platysperma* | 50 | 3.1 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Gayophytum diffusum* | 50 | 3.1 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Bromus tectorum* | 25 | 15.2 | 1.0 | 4.0 | 4.0 | | | | |
| | *Achnatherum occidentale* | 25 | 5.9 | 0.5 | 2.0 | 2.0 | | | | |
| | *Poa cusickii* | 25 | 2.9 | 0.3 | 1.0 | 1.0 | | | | |
| | *Poa secunda* | 25 | 3.8 | 0.3 | 1.0 | 1.0 | | | | |
| | *Eriogonum* | 25 | 0.8 | 0.1 | 0.2 | 0.2 | | | | |
| | *Corethrogyne filaginifolia* | 25 | 0.8 | 0.1 | 0.2 | 0.2 | | | | |
| | *Achnatherum speciosum* | 25 | 0.8 | 0.1 | 0.2 | 0.2 | | | | |
| | *Monardella linoides* | 25 | 0.8 | 0.1 | 0.2 | 0.2 | | | | |
| | *Lupinus albicaulis* | 25 | 0.8 | 0.1 | 0.2 | 0.2 | | | | |
| | *Leymus triticoides* | 25 | 0.8 | 0.1 | 0.2 | 0.2 | | | | |
| | *Lotus* | 25 | 0.8 | 0.1 | 0.2 | 0.2 | | | | |
| | *Penstemon rostriflorus* | 25 | 2.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Lupinus padre-crowleyi* | 25 | 1.0 | 0.0 | 0.1 | 0.1 | | | | |
| | *Linanthus pungens* | 25 | 2.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Hieracium horridum* | 25 | 2.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Frasera* | 25 | 0.3 | 0.0 | 0.1 | 0.1 | | | | |
| | Fern or Fern Ally | 25 | 2.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Eriogonum nudum* | 25 | 2.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Apocynum androsaemifolium* | 25 | 2.8 | 0.0 | 0.1 | 0.1 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 25 | 25.0 | 0.5 | 2.0 | 2.0 | | | | |

## *Pinus monophylla* – (*Juniperus osteosperma*) Woodland Alliance

**Common Name:** Singleleaf pinyon – Utah juniper woodlands

**NVC Alliance Code:** A2108. *Pinus monophylla* - *Juniperus osteosperma* / Shrub Understory Woodland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Pinus monophylla / Quercus john-tuckeri* | 5 | |
| *Pinus monophylla / Artemisia tridentata / Elymus elymoides* | 3 | |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1604 m, Range 1393 – 2040 m
Slope: Mean 20°, Range 6 – 32°
Aspect: Variable

Tree Cover: Mean 16.0%, Range 7 – 37%
Shrub Cover: Mean 11.3%, Range 3 – 28%
Herb Cover: Mean 6.9%, Range 2 – 19%

**Surface Covers:**
Large Rock: Mean 11.0%, Range 4.0 –20%
Small Rock: Mean 23.7%, Range 12 – 40%
Fines: Mean 46.0%, Range 24 – 65%
Litter: Mean 20.5%, Range 2 – 40%

**Conservation Status Rank: Global** G5; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **2** | **6** | | | | | | |

**Surveys Used in Description (N = 8):** ERSKMH59, JAWB0207, JAWB0208, POA1504161142, POA1504161521, POA1504161555, TEHA0112, TEHA0115

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus monophylla* | 100 | 64.7 | 11.4 | 2.0 | 27.2 | **x** | **x** | | **x** |
| | *Pinus sabiniana* | 75 | 21.5 | 2.3 | 1.2 | 4.0 | **x** | | | **x** |
| | *Juniperus californica* | 50 | 8.7 | 0.7 | 0.2 | 3.0 | | | | **x** |
| | *Quercus chrysolepis* | 38 | 3.8 | 1.3 | 0.2 | 8.2 | | | | |
| | *Yucca brevifolia* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Quercus john-tuckeri* | 63 | 41.0 | 4.8 | 5.0 | 14.0 | | | | **x** |
| | *Artemisia tridentata* | 63 | 21.1 | 2.1 | 1.0 | 7.7 | | | | **x** |
| | *Ephedra viridis* | 50 | 3.1 | 0.7 | 0.2 | 4.0 | | | | **x** |
| | *Eriogonum fasciculatum* | 38 | 8.5 | 1.1 | 2.0 | 4.0 | | | | |
| | *Opuntia basilaris* | 38 | 1.8 | 0.2 | 0.2 | 1.0 | | | | |
| | *Fremontodendron californicum* | 25 | 3.3 | 0.8 | 0.2 | 6.0 | | | | |
| | *Ceanothus cuneatus* | 25 | 2.9 | 0.7 | 0.2 | 5.0 | | | | |
| | *Hesperoyucca whipplei* | 25 | 3.6 | 0.4 | 0.2 | 3.0 | | | | |
| | *Eriogonum umbellatum* | 25 | 1.0 | 0.3 | 0.2 | 2.0 | | | | |
| | *Ericameria teretifolia* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cercocarpus montanus* var. *glaber* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 63 | 24.1 | 2.3 | 2.0 | 5.0 | | | | **x** |
| | *Poa secunda* | 63 | 20.2 | 1.8 | 0.2 | 5.0 | | | | **x** |
| | *Achnatherum speciosum* | 38 | 5.4 | 0.4 | 0.2 | 3.0 | | | | |
| | *Phacelia cicutaria* | 38 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Elymus elymoides* | 25 | 4.2 | 0.8 | 0.2 | 6.0 | | | | |
| | *Erigeron foliosus* | 25 | 1.7 | 0.3 | 0.2 | 2.0 | | | | |
| | *Stanleya* | 25 | 1.9 | 0.2 | 0.2 | 1.0 | | | | |
| | *Stephanomeria exigua* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Athysanus pusillus* | 25 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum nudum* | 25 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriophyllum* | 25 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Gilia* | 25 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 38 | 37.5 | 0.5 | 0.2 | 3.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Pinus monophylla / Artemisia tridentata / Elymus elymoides* Provisional Association

**Common Name:** Singleleaf Pinyon / Big Sagebrush / Big Squirreltail Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1857 m, Range 1677 – 2040 m
Slope: Mean 16°, Range 6 – 22°
Aspect: Variable

Tree Cover: Mean 25.2%, Range 9 – 37%
Shrub Cover: Mean 11.7%, Range 3 – 28%
Herb Cover: Mean 12.4%, Range 8 – 19%

**Surface Covers:**
Large Rock: Mean 10.0%, Range 5.0 –15%
Small Rock: Mean 15.6%, Range 12 – 19%
Fines: Mean 57.0%, Range 49 – 65%
Litter: Mean 13.5%, Range 2 – 25%

**Surveys Used in Description (N = 3):** ERSKMH59, JAWB0207, JAWB0208

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Pinus monophylla* | 100 | 83.0 | 20.2 | 8.3 | 27.2 | X | X | | X |
| *Quercus chrysolepis* | 100 | 10.1 | 3.5 | 0.2 | 8.2 | X | | | X |
| *Yucca brevifolia* | 67 | 1.0 | 0.1 | 0.2 | 0.2 | | | | X |
| *Pinus sabiniana* | 33 | 3.3 | 1.0 | 3.0 | 3.0 | | | | |
| *Pinus jeffreyi* | 33 | 2.6 | 1.0 | 3.0 | 3.0 | | | | |
| **Shrub** | | | | | | | | | |
| *Artemisia tridentata* | 100 | 45.2 | 3.9 | 1.0 | 7.7 | X | | X | X |
| *Opuntia basilaris* | 100 | 4.9 | 0.5 | 0.2 | 1.0 | X | | | X |
| *Fremontodendron californicum* | 67 | 8.9 | 2.1 | 0.2 | 6.0 | | | | X |
| *Ceanothus cuneatus* | 67 | 7.7 | 1.7 | 0.2 | 5.0 | | | | X |
| *Ephedra viridis* | 33 | 4.8 | 1.3 | 4.0 | 4.0 | | | | |
| *Eriogonum umbellatum* | 33 | 2.4 | 0.7 | 2.0 | 2.0 | | | | |
| *Eriogonum fasciculatum* | 33 | 2.4 | 0.7 | 2.0 | 2.0 | | | | |
| *Lupinus excubitus* | 33 | 9.8 | 0.3 | 1.0 | 1.0 | | | | |
| *Keckiella breviflora* | 33 | 9.8 | 0.3 | 1.0 | 1.0 | | | | |
| *Arceuthobium campylopodum* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Eriogonum wrightii* | 33 | 2.0 | 0.1 | 0.2 | 0.2 | | | | |
| *Cercocarpus montanus* var. *glaber* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Hesperoyucca whipplei* | 33 | 1.8 | 0.1 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 100 | 43.0 | 4.0 | 2.0 | 5.0 | X | | X | X |
| | *Poa secunda* | 100 | 19.0 | 2.2 | 0.2 | 5.0 | X | | | X |
| | *Erigeron foliosus* | 67 | 4.4 | 0.7 | 0.2 | 2.0 | | | | X |
| | *Eriophyllum* | 67 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Gilia* | 67 | 1.6 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Achnatherum speciosum* | 67 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Stephanomeria exigua* | 67 | 1.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Phacelia cicutaria* | 67 | 1.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Leptosiphon aureus* | 33 | 10.3 | 2.0 | 6.0 | 6.0 | | | | |
| | *Elymus elymoides* | 33 | 10.3 | 2.0 | 6.0 | 6.0 | | | | |
| | *Gilia leptantha* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Monardella linoides* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Phacelia fremontii* | 33 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Phacelia tanacetifolia* | 33 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cryptantha circumscissa* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Lotus* | 33 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Vulpia* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriastrum* | 33 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Amsinckia* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Mentzelia albicaulis* | 33 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriastrum densifolium* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 33 | 33.3 | 1.0 | 3.0 | 3.0 | | | | |

## *Pinus monophylla* / *Quercus john-tuckeri* Provisional Association

**Common Name:** Singleleaf Pinyon / Tucker Oak Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1452 m, Range 1393 – 1504 m
Slope: Mean 27°, Range 22 – 32°
Aspect: Variable

Tree Cover: Mean 10.4%, Range 7 – 16%
Shrub Cover: Mean 11.0%, Range 5 – 17%
Herb Cover: Mean 3.6%, Range 2 – 6%

**Surface Covers:**
Large Rock: Mean 12.0%, Range 4.0 –20%
Small Rock: Mean 40.0%, Range 40 – 40%
Fines: Mean 24.0%, Range 24 – 24%
Litter: Mean 27.5%, Range 15 – 40%

**Surveys Used in Description (N = 5):** POA1504161142, POA1504161521, POA1504161555, TEHA0112, TEHA0115

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Pinus monophylla* | 100 | 53.7 | 6.2 | 2.0 | 12.0 | X | X | | X |
| *Pinus sabiniana* | 100 | 32.5 | 3.1 | 1.2 | 4.0 | X | | X | X |
| *Juniperus californica* | 80 | 13.8 | 1.1 | 0.2 | 3.0 | X | | | X |
| **Shrub** | | | | | | | | | |
| *Quercus john-tuckeri* | 100 | 65.6 | 7.6 | 5.0 | 14.0 | X | X | | X |
| *Ephedra viridis* | 60 | 2.0 | 0.3 | 0.2 | 1.0 | | | | X |
| *Eriogonum fasciculatum* | 40 | 12.2 | 1.4 | 3.0 | 4.0 | | | | |
| *Artemisia tridentata* | 40 | 6.6 | 1.0 | 2.0 | 3.0 | | | | |
| *Ericameria teretifolia* | 40 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| *Hesperoyucca whipplei* | 20 | 4.7 | 0.6 | 3.0 | 3.0 | | | | |
| *Ericameria linearifolia* | 20 | 4.0 | 0.4 | 2.0 | 2.0 | | | | |
| *Ericameria nauseosa* | 20 | 2.0 | 0.4 | 2.0 | 2.0 | | | | |
| *Arctostaphylos patula* | 20 | 1.0 | 0.2 | 1.0 | 1.0 | | | | |
| *Atriplex canescens* | 20 | 0.3 | 0.0 | 0.2 | 0.2 | | | | |
| *Eriogonum umbellatum* | 20 | 0.2 | 0.0 | 0.2 | 0.2 | | | | |
| *Cercocarpus montanus* var. *glaber* | 20 | 0.3 | 0.0 | 0.2 | 0.2 | | | | |
| *Grayia spinosa* | 20 | 0.2 | 0.0 | 0.2 | 0.2 | | | | |
| *Lepidium fremontii* | 20 | 0.3 | 0.0 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Poa secunda* | 40 | 21.0 | 1.6 | 3.0 | 5.0 | | | | |
| | *Bromus tectorum* | 40 | 12.8 | 1.2 | 2.0 | 4.0 | | | | |
| | *Stanleya* | 40 | 3.0 | 0.2 | 0.2 | 1.0 | | | | |
| | *Athysanus pusillus* | 40 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum nudum* | 40 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Achnatherum speciosum* | 20 | 7.9 | 0.6 | 3.0 | 3.0 | | | | |
| | *Claytonia parviflora* | 20 | 7.7 | 0.4 | 2.0 | 2.0 | | | | |
| | *Bromus rubens* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Stephanomeria virgata* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Phacelia cicutaria* | 20 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| | *Elymus elymoides* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Distichlis spicata* | 20 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| | *Descurainia pinnata* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Penstemon grinnellii* ssp. *scrophularioides* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Gilia modocensis* | 20 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| | *Claytonia perfoliata* | 20 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| | *Asclepias* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Thysanocarpus* | 20 | 0.8 | 0.0 | 0.2 | 0.2 | | | | |
| | *Collinsia heterophylla* | 20 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | | | | | | | | | |

## *Pinus sabiniana* Woodland Alliance

**Common Name:** Foothill pine woodland

**NVC Alliance Code:** A3356. *Pinus attenuata* - *Pinus coulteri* - *Pinus sabiniana* Woodland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Pinus sabiniana – Juniperus californica* / grass | 1 | |
| *Pinus sabiniana* (alliance) | 1 | A3356 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1367 m, Range 1337 – 1397 m
Slope: 27°
Aspect: Northwest-facing

Tree Cover: Mean 6.5%, Range 2 – 11%
Shrub Cover: Mean 6.5%, Range 1 – 12%
Herb Cover: Mean 7.5%, Range 2 – 13%

**Surface Covers:**
Large Rock: 19%
Small Rock: 38%
Fines: 20%
Litter: 18%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **1** | **1** | | | | | | |

**Surveys Used in Description (N = 2):** JAWB0118, POA1504011144

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus sabiniana* | 100 | 73.6 | 8.0 | 5.0 | 11.0 | **x** | **x** | | **x** |
| | Standing snag | 50 | 14.7 | 1.5 | 3.0 | 3.0 | | | | **x** |
| | *Quercus douglasii* | 50 | 9.8 | 1.0 | 2.0 | 2.0 | | | | **x** |
| | *Quercus wislizeni* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Juniperus californica* | 50 | 0.9 | 0.1 | 0.2 | 0.2 | | | | **x** |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria linearifolia* | 100 | 25.9 | 1.1 | 0.2 | 2.0 | **x** | | | **x** |
| | *Eriogonum fasciculatum* | 50 | 32.4 | 3.5 | 7.0 | 7.0 | | | | **x** |
| | *Ericameria cuneata* | 50 | 4.6 | 0.5 | 1.0 | 1.0 | | | | **x** |
| | *unknown Asteraceae* | 50 | 0.9 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Salvia dorrii* | 50 | 0.9 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Artemisia tridentata* | 50 | 16.7 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Eriogonum wrightii* | 50 | 0.9 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Ephedra viridis* | 50 | 0.9 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Ericameria nauseosa* | 50 | 16.7 | 0.1 | 0.2 | 0.2 | | | | **x** |
| **Herb** | | | | | | | | | | |
| | *Poa secunda* | 100 | 49.4 | 1.5 | 1.0 | 2.0 | **x** | | **x** | **x** |
| | *Bromus rubens* | 50 | 43.7 | 5.5 | 11.0 | 11.0 | | | | **x** |
| | *Achnatherum speciosum* | 50 | 0.8 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Achillea millefolium* | 50 | 4.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Eriogonum nudum* | 50 | 0.8 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Leymus triticoides* | 50 | 0.8 | 0.1 | 0.2 | 0.2 | | | | **x** |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 50 | 50.0 | 1.5 | 3.0 | 3.0 | | | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Pinus sabiniana – Juniperus californica* / grass Association

**Common Name:** Foothill Pine / California Juniper / grass Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: 1337 m
Slope: 27°
Aspect: Northwest-facing

Tree Cover: 11%
Shrub Cover: 12%
Herb Cover: 13%

**Surface Covers:**
Large Rock: 19%
Small Rock: 38%
Fines: 20%
Litter: 18%

**Surveys Used in Description (N = 1):** JAWB0118

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus sabiniana* | 100 | 98.2 | 11.0 | 11.0 | 11.0 | X | X | | X |
| | *Juniperus californica* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Shrub** | | | | | | | | | | |
| | *Eriogonum fasciculatum* | 100 | 64.8 | 7.0 | 7.0 | 7.0 | X | X | | X |
| | *Ericameria linearifolia* | 100 | 18.5 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Ericameria cuneata* | 100 | 9.3 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Salvia dorrii* | 100 | 1.9 | 0.2 | 0.2 | 0.2 | X | | | X |
| | unknown Asteraceae | 100 | 1.9 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Ephedra viridis* | 100 | 1.9 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Eriogonum wrightii* | 100 | 1.9 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 100 | 87.3 | 11.0 | 11.0 | 11.0 | X | X | | X |
| | *Poa secunda* | 100 | 7.9 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Eriogonum nudum* | 100 | 1.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Achnatherum speciosum* | 100 | 1.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Leymus triticoides* | 100 | 1.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 100 | 100. | 3.0 | 3.0 | 3.0 | X | X | | X |

## *Populus fremontii – Fraxinus velutina – Salix gooddingii* Forest Alliance

**Common Name:** Fremont cottonwood forest

**NVC Alliance Code:** A3803. *Populus fremontii - Fraxinus velutina - Salix gooddingii* Riparian Forest & Woodland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Populus fremontii – Fraxinus velutina* | 1 | CEGL000942 |
| *Populus fremontii – Salix gooddingii* | 3 | CEGL000944 |
| *Populus fremontii – Salix lasiolepis* | 1 | |
| *Populus fremontii / Salix exigua* | 1 | |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 866 m, Range 330 – 1217 m
Slope: Mean 1°, Range 0 – 4°
Aspect: Variable

Tree Cover: Mean 43.2%, Range 6 – 78%
Shrub Cover: Mean 23.3%, Range 0 – 56%
Herb Cover: Mean 18.2%, Range 2 – 50%

**Surface Covers:**
Large Rock: Mean 1.3%, Range 0.0 –6%
Small Rock: Mean 8.3%, Range 0 – 34%
Fines: Mean 22.5%, Range 3 – 55%
Litter: Mean 50.5%, Range 10 – 80%

**Conservation Status Rank: Global** G4; **State (California)** S3

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **4** | | | | | | | | **2** |

**Surveys Used in Description (N = 6):** A1806041619, DEVA9814, JAWB0002, JAWB0010, JAWB0102, MOJC1234

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Populus fremontii* | 100 | 69.1 | 32.9 | 6.2 | 60.5 | **x** | **x** | | **x** |
| | *Salix gooddingii* | 67 | 10.6 | 7.3 | 1.0 | 35.0 | | | | **x** |
| | *Salix laevigata* | 67 | 9.2 | 1.7 | 0.4 | 8.0 | | | | **x** |
| | *Prosopis pubescens* | 33 | 1.2 | 0.9 | 0.2 | 5.0 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Baccharis salicifolia* | 67 | 27.8 | 5.3 | 2.0 | 13.0 | | | | **x** |
| | *Ericameria nauseosa* | 50 | 13.5 | 6.0 | 3.0 | 28.0 | | | | **x** |
| | *Salix exigua* | 33 | 20.2 | 5.2 | 1.0 | 30.0 | | | | |
| | *Salix lasiolepis* | 33 | 8.3 | 3.8 | 3.0 | 20.0 | | | | |
| | *Baccharis sergiloides* | 33 | 4.4 | 1.5 | 2.0 | 7.0 | | | | |
| | *Tamarix ramosissima* | 33 | 9.7 | 0.1 | 0.2 | 0.5 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 50 | 6.1 | 1.2 | 1.0 | 3.0 | | | | **x** |
| | *Bromus tectorum* | 50 | 11.9 | 0.7 | 0.2 | 4.0 | | | | **x** |
| | *Heliotropium curassavicum* | 50 | 6.9 | 0.3 | 0.2 | 1.0 | | | | **x** |
| | *Cynodon dactylon* | 33 | 1.1 | 0.4 | 0.5 | 2.0 | | | | |
| | *Artemisia douglasiana* | 33 | 6.9 | 0.2 | 0.2 | 1.0 | | | | |
| | *Sonchus* | 33 | 0.5 | 0.1 | 0.2 | 0.5 | | | | |
| | *Polypogon monspeliensis* | 33 | 0.3 | 0.1 | 0.2 | 0.5 | | | | |
| | *Datura wrightii* | 33 | 1.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Marrubium vulgare* | 33 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Solanum* | 33 | 1.3 | 0.1 | 0.2 | 0.2 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Populus fremontii – Fraxinus velutina* Association

**Common Name:** Fremont Cottonwood – Arizona Ash Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: 1073 m
Slope: no data
Aspect: no data

Tree Cover: 6%
Shrub Cover: 21%
Herb Cover: 2%

**Surface Covers:**
Large Rock: 0%
Small Rock: 34%
Fines: 55%
Litter: 10%

**Surveys Used in Description (N = 1):** JAWB0002

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Fraxinus velutina* | 100 | 54.8 | 8.0 | 8.0 | 8.0 | X | X | | X |
| | *Populus fremontii* | 100 | 42.5 | 6.2 | 6.2 | 6.2 | X | | X | X |
| | *Salix laevigata* | 100 | 2.7 | 0.4 | 0.4 | 0.4 | X | | | X |
| **Shrub** | | | | | | | | | | |
| | *Baccharis salicifolia* | 100 | 100. | 13.0 | 13.0 | 13.0 | X | X | | X |
| **Herb** | | | | | | | | | | |
| | *Heliotropium curassavicum* | 100 | 38.5 | 1.0 | 1.0 | 1.0 | X | | X | X |
| | *Artemisia douglasiana* | 100 | 38.5 | 1.0 | 1.0 | 1.0 | X | | X | X |
| | *Datura wrightii* | 100 | 7.7 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Solanum* | 100 | 7.7 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Bromus tectorum* | 100 | 7.7 | 0.2 | 0.2 | 0.2 | X | | | X |

## *Populus fremontii – Salix gooddingii* Association

**Common Name:** Fremont Cottonwood – Goodding's Willow Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 605 m, Range 330 – 1154 m
Slope: Mean 1°, Range 0 – 4°
Aspect: Variable

Tree Cover: Mean 67.7%, Range 55 – 78%
Shrub Cover: Mean 7.7%, Range 0 – 20%
Herb Cover: Mean 32.3%, Range 20 – 50%

**Surface Covers:**
Large Rock: Mean 2.1%, Range 0.0 –6%
Small Rock: Mean 0.2%, Range 0 – 0%
Fines: Mean 16.5%, Range 3 – 33%
Litter: Mean 54.2%, Range 50 – 63%

**Surveys Used in Description (N = 3):** DEVA9814, JAWB0102, MOJC1234

**Association Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Populus fremontii* | 100 | 76.3 | 51.2 | 40.0 | 60.5 | X | X | | X |
| | *Salix gooddingii* | 100 | 19.1 | 14.3 | 4.0 | 35.0 | X | | | X |
| | *Prosopis pubescens* | 67 | 2.5 | 1.7 | 0.2 | 5.0 | | | | X |
| | *Salix laevigata* | 67 | 0.8 | 0.5 | 0.5 | 1.0 | | | | X |
| | *Prosopis glandulosa* | 33 | 1.3 | 1.0 | 3.0 | 3.0 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Tamarix ramosissima* | 67 | 19.4 | 0.2 | 0.2 | 0.5 | | | | X |
| | *Baccharis salicifolia* | 33 | 16.7 | 3.3 | 10.0 | 10.0 | | | | |
| | *Ericameria nauseosa* | 33 | 8.3 | 1.7 | 5.0 | 5.0 | | | | |
| | *Salix lasiolepis* | 33 | 5.0 | 1.0 | 3.0 | 3.0 | | | | |
| | *Baccharis sergiloides* | 33 | 3.3 | 0.7 | 2.0 | 2.0 | | | | |
| | *Salix exigua* | 33 | 16.7 | 0.3 | 1.0 | 1.0 | | | | |
| | *Phoradendron* | 33 | 8.3 | 0.2 | 0.5 | 0.5 | | | | |
| | *Atriplex polycarpa* | 33 | 11.1 | 0.1 | 0.2 | 0.2 | | | | |
| | unknown Asteraceae | 33 | 11.1 | 0.1 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 67 | 7.0 | 2.0 | 3.0 | 3.0 | | | | X |
| | *Cynodon dactylon* | 67 | 2.1 | 0.8 | 0.5 | 2.0 | | | | X |
| | *Sonchus* | 67 | 0.9 | 0.2 | 0.2 | 0.5 | | | | X |
| | *Polypogon monspeliensis* | 67 | 0.7 | 0.2 | 0.2 | 0.5 | | | | X |
| | *Heliotropium curassavicum* | 67 | 0.9 | 0.2 | 0.2 | 0.5 | | | | X |
| | *Scirpus* | 33 | 28.6 | 6.0 | 18.0 | 18.0 | | | | |
| | *Eleocharis rostellata* | 33 | 9.4 | 4.7 | 14.0 | 14.0 | | | | |
| | *Schoenoplectus americanus* | 33 | 7.3 | 3.7 | 11.0 | 11.0 | | | | |
| | *Lythrum californicum* | 33 | 6.7 | 3.3 | 10.0 | 10.0 | | | | |
| | *Typha* | 33 | 5.3 | 2.7 | 8.0 | 8.0 | | | | |
| | *Leymus triticoides* | 33 | 11.6 | 2.3 | 7.0 | 7.0 | | | | |
| | *Juncus mexicanus* | 33 | 9.9 | 2.0 | 6.0 | 6.0 | | | | |
| | *Distichlis spicata* | 33 | 3.3 | 0.7 | 2.0 | 2.0 | | | | |
| | *Eleocharis parishii* | 33 | 1.6 | 0.3 | 1.0 | 1.0 | | | | |
| | *Carex* | 33 | 0.8 | 0.2 | 0.5 | 0.5 | | | | |
| | *Polypogon maritimus* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Anemopsis californica* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Melilotus* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Marrubium vulgare* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Lactuca* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Glandularia gooddingii* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Descurainia sophia* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Amsinckia* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus diandrus* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Datura wrightii* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus tectorum* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Solanum* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Uropappus lindleyi* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Conyza* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |

## *Populus fremontii – Salix lasiolepis* Association

**Common Name:** Fremont Cottonwood – Arroyo Willow Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: 1217 m
Slope: 1°
Aspect: Northeast-facing

Tree Cover: 30%
Shrub Cover: 56%
Herb Cover: 5%

**Surface Covers:**
Large Rock: 0.2%
Small Rock: 7%
Fines: 8%
Litter: 80%

**Surveys Used in Description (N = 1):** JAWB0010

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Populus fremontii* | 100 | 99.3 | 30.2 | 30.2 | 30.2 | X | X | | X |
| | *Yucca brevifolia* | 100 | 0.7 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 100 | 49.0 | 28.0 | 28.0 | 28.0 | X | | X | X |
| | *Salix lasiolepis* | 100 | 35.0 | 20.0 | 20.0 | 20.0 | X | | X | X |
| | *Baccharis salicifolia* | 100 | 12.2 | 7.0 | 7.0 | 7.0 | X | | | X |
| | *Artemisia tridentata* | 100 | 1.7 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Cylindropuntia echinocarpa* | 100 | 0.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Penstemon incertus* | 100 | 0.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Hymenoclea salsola* | 100 | 0.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Brickellia californica* | 100 | 0.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Encelia actonii* | 100 | 0.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Ericameria linearifolia* | 100 | 0.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 100 | 62.5 | 4.0 | 4.0 | 4.0 | X | X | | X |
| | *Bromus rubens* | 100 | 15.6 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Gilia tricolor* | 100 | 3.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Mentzelia albicaulis* | 100 | 3.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Marrubium vulgare* | 100 | 3.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Artemisia douglasiana* | 100 | 3.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Achnatherum speciosum* | 100 | 3.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Phacelia cicutaria* | 100 | 3.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Erodium cicutarium* | 100 | 3.1 | 0.2 | 0.2 | 0.2 | X | | | X |

## *Populus fremontii* / *Salix exigua* Association

**Common Name:** Fremont Cottonwood / Sandbar Willow Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: 1091 m
Slope: no data
Aspect: no data

Tree Cover: 20%
Shrub Cover: 40%
Herb Cover: 5%

**Surface Covers:**
Large Rock: no data
Small Rock: no data
Fines: no data
Litter: no data

**Surveys Used in Description (N = 1):** A1806041619

**Association Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Salix laevigata* | 100 | 50.0 | 8.0 | 8.0 | 8.0 | X | X | | X |
| | *Populus fremontii* | 100 | 43.8 | 7.0 | 7.0 | 7.0 | X | | X | X |
| | *Salix gooddingii* | 100 | 6.3 | 1.0 | 1.0 | 1.0 | X | | | X |
| **Shrub** | | | | | | | | | | |
| | *Salix exigua* | 100 | 71.4 | 30.0 | 30.0 | 30.0 | X | X | | X |
| | *Baccharis sergiloides* | 100 | 16.7 | 7.0 | 7.0 | 7.0 | X | | | X |
| | *Ericameria nauseosa* | 100 | 7.1 | 3.0 | 3.0 | 3.0 | X | | | X |
| | *Baccharis salicifolia* | 100 | 4.8 | 2.0 | 2.0 | 2.0 | X | | | X |
| **Herb** | | | | | | | | | | |
| | *Stanleya* | 100 | 100. | 0.2 | 0.2 | 0.2 | X | X | | X |

## *Populus trichocarpa* Forest Alliance

**Common Name:** Black cottonwood forest

**NVC Alliance Code:** A3743. *Fraxinus latifolia - Populus balsamifera* ssp. *trichocarpa - Alnus* spp. Riparian Forest Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Populus trichocarpa – Salix lasiolepis* | 1 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: 1301 m
Slope: 3°
Aspect: Southeast-facing

Tree Cover: 24%
Shrub Cover: 44%
Herb Cover: 5%

**Surface Covers:**
Large Rock: 2.4%
Small Rock: 0.4%
Fines: 1.0%
Litter: 84.0%

**Conservation Status Rank: Global** G5; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | **1** | | | | | |

**Surveys Used in Description (N = 1):** OWVA0022

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Populus balsamifera* ssp. *trichocarpa* | 100 | 83.3 | 20.0 | 20.0 | 20.0 | x | x | | x |
| | *Salix laevigata* | 100 | 8.3 | 2.0 | 2.0 | 2.0 | x | | | x |
| | *Betula occidentalis* | 100 | 8.3 | 2.0 | 2.0 | 2.0 | x | | | x |
| **Shrub** | | | | | | | | | | |
| | *Salix lasiolepis* | 100 | 88.1 | 40.0 | 40.0 | 40.0 | x | x | | x |
| | *Clematis ligusticifolia* | 100 | 6.6 | 3.0 | 3.0 | 3.0 | x | | | x |
| | *Artemisia dracunculus* | 100 | 2.2 | 1.0 | 1.0 | 1.0 | x | | | x |
| | *Artemisia tridentata* | 100 | 2.2 | 1.0 | 1.0 | 1.0 | x | | | x |
| | *Ericameria nauseosa* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | x | | | x |
| | *Artemisia ludoviciana* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | x | | | x |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Leymus triticoides* | 100 | 78.9 | 3.0 | 3.0 | 3.0 | **x** | **x** | | **x** |
| | *Glycyrrhiza lepidota* | 100 | 5.3 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Maianthemum stellatum* | 100 | 5.3 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Artemisia douglasiana* | 100 | 5.3 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Stachys albens* | 100 | 5.3 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Prosopis glandulosa – Prosopis velutina – Prosopis pubescens* Woodland Alliance

**Common Name:** Mesquite thickets

**NVC Alliance Code:** A3877. *Prosopis glandulosa - Prosopis velutina - Prosopis pubescens* Wet Scrub Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Prosopis glandulosa* var. *torreyana* | 7 | CEGL001381 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 439 m, Range -62 – 977 m
Slope: Mean 6°, Range 1 – 24°
Aspect: Variable

Tree Cover: Mean 51.8%, Range 0 – 81%
Shrub Cover: Mean 48.3%, Range 9 – 80%
Herb Cover: Mean 6.2%, Range 0 – 15%

**Surface Covers:**
Large Rock: Mean 0.4%, Range 0.0 –2%
Small Rock: Mean 7.1%, Range 0 – 15%
Fines: Mean 75.3%, Range 14 – 88%
Litter: Mean 15.1%, Range 3 – 66%

**Conservation Status Rank: Global** G5; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | | | | **5** | | | | **1** |

**Surveys Used in Description (N = 7):** DEVA0434, DEVA9470, JAWB0203, MOJC0036, MOJC0041, MOJC0048, MOJC0051

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Prosopis glandulosa* | 100 | 100.0 | 62.5 | 5.0 | 80.5 | **x** | **x** | | **x** |
| **Shrub** | | | | | | | | | | |
| | *Atriplex polycarpa* | 43 | 33.3 | 1.3 | 0.5 | 4.5 | | | | |
| **Herb** | | | | | | | | | | |
| | *Schismus* | 29 | 19.7 | 1.5 | 0.2 | 10.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Quercus chrysolepis* (tree) Forest Alliance

**Common Name:** Canyon live oak forest

**NVC Alliance Code:** A3349. *Quercus chrysolepis - Quercus kelloggii* Forest & Woodland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Quercus chrysolepis / Quercus wislizeni* | 4 | |
| *Quercus chrysolepis* (alliance) | 3 | A3349 |
| *Quercus chrysolepis* | 2 | |
| *Quercus chrysolepis – Pinus sabiniana* | 2 | |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1583 m, Range 1292 – 2052 m
Slope: Mean 22°, Range 5 – 39°
Aspect: Mostly northeast-facing

Tree Cover: Mean 42.9%, Range 21 – 95%
Shrub Cover: Mean 4.3%, Range 0 – 10%
Herb Cover: Mean 13.0%, Range 0 – 55%

**Surface Covers:**
Large Rock: Mean 8.8%, Range 0.0 –37%
Small Rock: Mean 16.0%, Range 0 – 40%
Fines: Mean 51.0%, Range 30 – 94%
Litter: Mean 19.4%, Range 0 – 65%

**Conservation Status Rank: Global** G5; **State (California)** S5

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | **5** | **5** | | | | | | |

**Surveys Used in Description (N = 11):** ERSKMH58, F1806051621, JAWB0005, JAWB0011, JAWB0020, JAWB0022, POA1504011117, SLTN0354, SLTN0601, SLTN0667, TEHA0032

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Quercus chrysolepis* | 91 | 67.2 | 32.1 | 11.0 | 100 | x | x | | x |
| | *Pinus sabiniana* | 45 | 8.0 | 2.2 | 1.0 | 10.0 | | | | |
| | *Quercus wislizeni* | 36 | 11.2 | 3.1 | 2.0 | 14.0 | | | | |
| | *Pinus monophylla* | 36 | 2.6 | 1.6 | 0.2 | 15.1 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 27 | 7.7 | 0.2 | 0.5 | 1.0 | | | | |
| | *Lupinus excubitus* | 27 | 5.1 | 0.1 | 0.2 | 0.5 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Poa secunda* | 45 | 8.7 | 1.2 | 1.0 | 4.0 | | | | |
| | *Bromus diandrus* | 36 | 9.1 | 1.5 | 1.0 | 9.0 | | | | |
| | *Bromus tectorum* | 36 | 6.6 | 0.9 | 0.1 | 6.0 | | | | |
| | *Galium aparine* | 27 | 12.9 | 2.2 | 3.0 | 12.0 | | | | |
| | *Claytonia perfoliata* | 27 | 1.9 | 0.3 | 0.2 | 2.0 | | | | |
| | *Chenopodium* | 27 | 4.7 | 0.0 | 0.1 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 27 | 26.4 | 2.2 | 2.0 | 20.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Quercus chrysolepis* Association

**Common Name:** Canyon Live Oak Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1637 m, Range 1301 – 1973 m
Slope: Mean 21°, Range 8 – 33°
Aspect: Variable

Tree Cover: Mean 41.5%, Range 37 – 46%
Shrub Cover: Mean 1.0%, Range 1 – 1%
Herb Cover: Mean 9.1%, Range 0 – 18%

**Surface Covers:**
Large Rock: Mean 5.5%, Range 5.0 –6%
Small Rock: Mean 22.5%, Range 5 – 40%
Fines: Mean 43.5%, Range 35 – 52%
Litter: Mean 17.6%, Range 0 – 35%

**Surveys Used in Description (N = 2):** JAWB0022, SLTN0601

### Association Stand Table:

| Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Quercus chrysolepis* | 100 | 90.5 | 37.7 | 30.0 | 45.4 | | | | X |
| *Pinus monophylla* | 50 | 9.5 | 3.5 | 7 | 7 | | | | |
| **Shrub** | | | | | | | | | |
| *Ribes roezlii* | 50 | 50.0 | 0.5 | 1.0 | 1.0 | | | | X |
| *Lupinus excubitus* | 50 | 20.8 | 0.3 | 0.5 | 0.5 | | | | X |
| unknown Asteraceae | 50 | 8.3 | 0.1 | 0.2 | 0.2 | | | | X |
| *Eriogonum wrightii* | 50 | 4.2 | 0.1 | 0.1 | 0.1 | | | | X |
| *Opuntia basilaris* | 50 | 4.2 | 0.1 | 0.1 | 0.1 | | | | X |
| *Penstemon fruticiformis* | 50 | 4.2 | 0.1 | 0.1 | 0.1 | | | | X |
| *Artemisia tridentata* | 50 | 4.2 | 0.1 | 0.1 | 0.1 | | | | X |
| *Eriogonum wrightii* | 50 | 4.2 | 0.1 | 0.1 | 0.1 | | | | X |
| Shrub (>.5m) | 50 | 4.2 | 0.1 | 0.1 | 0.1 | | | | X |

| Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | |
| *Galium aparine* | 50 | 29.7 | 6.0 | 12.0 | 12.0 | | | | X |
| *Bromus diandrus* | 50 | 9.9 | 2.0 | 4.0 | 4.0 | | | | X |
| *Osmorhiza brachypoda* | 50 | 5.0 | 1.0 | 2.0 | 2.0 | | | | X |
| *Athysanus pusillus* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Pholistoma auritum* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Collinsia childii* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Yabea microcarpa* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Phacelia tanacetifolia* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Amsinckia* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Viola purpurea* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Chenopodium* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Phacelia tanacetifolia* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Clarkia heterandra* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Clarkia heterandra* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Claytonia perfoliata* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Claytonia perfoliata* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Delphinium* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Delphinium* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Yabea microcarpa* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Collinsia childii* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Cirsium* | 50 | 8.3 | 0.1 | 0.1 | 0.1 | | | | X |
| *Bromus tectorum* | 50 | 8.3 | 0.1 | 0.1 | 0.1 | | | | X |
| *Bromus tectorum* | 50 | 8.3 | 0.1 | 0.1 | 0.1 | | | | X |
| *Achnatherum hymenoides* | 50 | 8.3 | 0.1 | 0.1 | 0.1 | | | | X |
| *Achnatherum hymenoides* | 50 | 8.3 | 0.1 | 0.1 | 0.1 | | | | X |
| *Poa* | 50 | 8.3 | 0.1 | 0.1 | 0.1 | | | | X |
| *Arabis* | 50 | 8.3 | 0.1 | 0.1 | 0.1 | | | | X |
| *Arabis* | 50 | 8.3 | 0.1 | 0.1 | 0.1 | | | | X |
| *Eriogonum nudum* | 50 | 8.3 | 0.1 | 0.1 | 0.1 | | | | X |
| *Cirsium* | 50 | 8.3 | 0.1 | 0.1 | 0.1 | | | | X |
| *Eriogonum nudum* | 50 | 8.3 | 0.1 | 0.1 | 0.1 | | | | X |
| *Poa* | 50 | 8.3 | 0.1 | 0.1 | 0.1 | | | | X |

## *Quercus chrysolepis – Pinus sabiniana* Association

**Common Name:** Canyon Live Oak – Foothill Pine Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1430 m, Range 1292 – 1567 m
Slope: 32°
Aspect: Northeast-facing

Tree Cover: Mean 27.1%, Range 22 – 32%
Shrub Cover: 1%
Herb Cover: 4%

**Surface Covers:**
Large Rock: 10%
Small Rock: 35%
Fines: 50%
Litter: 3%

**Surveys Used in Description (N = 2):** F1806051621, JAWB0005

**Association Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Quercus chrysolepis* | 100 | 61.6 | 17.2 | 12.4 | 22.0 | X | X | | X |
| | *Pinus sabiniana* | 100 | 33.2 | 9.0 | 8.0 | 10.0 | X | | X | X |
| | *Pinus monophylla* | 50 | 4.4 | 1.0 | 2.0 | 2.0 | | | | X |
| | *Yucca brevifolia* | 50 | 0.9 | 0.2 | 0.4 | 0.4 | | | | X |
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 50 | 31.2 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Lupinus excubitus* | 50 | 6.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Ephedra viridis* | 50 | 6.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Purshia tridentata* | 50 | 6.3 | 0.1 | 0.2 | 0.2 | | | | X |
| **Herb** | | | | | | | | | | |
| | *Poa secunda* | 50 | 16.7 | 1.0 | 2.0 | 2.0 | | | | X |
| | *Tauschia parishii* | 50 | 8.3 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Bromus tectorum* | 50 | 8.3 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Galium hallii* | 50 | 8.3 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Coreopsis bigelovii* | 50 | 1.7 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Collinsia callosa* | 50 | 1.7 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Eriogonum saxatile* | 50 | 1.7 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Chaenactis santolinoides* | 50 | 1.7 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Arenaria macradenia* | 50 | 1.7 | 0.1 | 0.2 | 0.2 | | | | X |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 100 | 95.5 | 11.0 | 2.0 | 20.0 | X | X | | X |
| | Moss | 50 | 4.5 | 0.1 | 0.2 | 0.2 | | | | X |

## *Quercus chrysolepis / Quercus wislizeni* Association

**Common Name:** Canyon Live Oak / Shrub Interior Live Oak Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1518 m, Range 1411 – 1739 m
Slope: Mean 14°, Range 5 – 30°
Aspect: Variable

Tree Cover: Mean 32.7%, Range 21 – 42%
Shrub Cover: Mean 5.6%, Range 0 – 10%
Herb Cover: Mean 12.8%, Range 3 – 20%

**Surface Covers:**
Large Rock: Mean 14.3%, Range 0.0 –37%
Small Rock: Mean 7.7%, Range 1 – 20%
Fines: Mean 37.3%, Range 30 – 52%
Litter: Mean 38.3%, Range 10 – 65%

**Surveys Used in Description (N = 4):** JAWB0011, JAWB0020, POA1504011117, TEHA0032

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Quercus chrysolepis* | 100 | 63.3 | 20.7 | 11.0 | 38.2 | X | X | | X |
| | *Quercus wislizeni* | 100 | 30.7 | 8.6 | 2.0 | 14.0 | X | | X | X |
| | *Pinus sabiniana* | 75 | 5.5 | 1.5 | 1.0 | 3.0 | X | | | X |
| | *Pinus monophylla* | 50 | 0.5 | 0.2 | 0.2 | 0.4 | | | | X |
| **Shrub** | | | | | | | | | | |
| | *Garrya flavescens* | 25 | 21.9 | 1.8 | 7.0 | 7.0 | | | | |
| | *Ribes roezlii* | 25 | 25.0 | 1.0 | 4.0 | 4.0 | | | | |
| | *Arctostaphylos glauca* | 25 | 11.4 | 1.0 | 4.0 | 4.0 | | | | |
| | *Hesperoyucca whipplei* | 25 | 5.7 | 0.5 | 2.0 | 2.0 | | | | |
| | *Ceanothus* | 25 | 3.1 | 0.3 | 1.0 | 1.0 | | | | |
| | *Ericameria linearifolia* | 25 | 2.8 | 0.3 | 1.0 | 1.0 | | | | |
| | *Ericameria nauseosa* | 25 | 2.8 | 0.3 | 1.0 | 1.0 | | | | |
| | *Ribes velutinum* | 25 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Salix lasiolepis* | 25 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Ephedra nevadensis* | 25 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Keckiella breviflora* | 25 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus diandrus* | 75 | 20.1 | 3.0 | 1.0 | 9.0 | X | | | X |
| | *Poa secunda* | 75 | 13.8 | 1.8 | 1.0 | 3.0 | X | | | X |
| | *Galium aparine* | 50 | 20.6 | 3.0 | 3.0 | 9.0 | | | | X |
| | *Claytonia perfoliata* | 50 | 5.1 | 0.8 | 1.0 | 2.0 | | | | X |
| | *Bromus rubens* | 25 | 16.0 | 2.5 | 10.0 | 10.0 | | | | |
| | *Stellaria* | 25 | 4.5 | 0.8 | 3.0 | 3.0 | | | | |
| | *Bromus tectorum* | 25 | 7.2 | 0.8 | 3.0 | 3.0 | | | | |
| | *Melica imperfecta* | 25 | 3.2 | 0.5 | 2.0 | 2.0 | | | | |
| | *Viola* | 25 | 2.4 | 0.3 | 1.0 | 1.0 | | | | |
| | *Claytonia* | 25 | 2.4 | 0.3 | 1.0 | 1.0 | | | | |
| | *Eriogonum nudum* | 25 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Galium* | 25 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 25 | 25.0 | 0.5 | 2.0 | 2.0 | | | | |

## *Quercus douglasii* Woodland Alliance

**Common Name:** Blue oak woodland

**NVC Alliance Code:** A3348. *Quercus douglasii - Pinus sabiniana* Woodland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Quercus douglasii – Juniperus californica / Ericameria linearifolia* | 1 | |
| *Quercus douglasii* (alliance) | 2 | A3348 |
| *Quercus douglasii / Ericameria linearifolia* | 3 | |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1295 m, Range 1084 – 1520 m
Slope: Mean 15°, Range 12 – 18°
Aspect: Variable

Tree Cover: Mean 26.9%, Range 18 – 33%
Shrub Cover: Mean 10.9%, Range 0 – 20%
Herb Cover: Mean 47.8%, Range 15 – 86%

**Surface Covers:**
Large Rock: Mean 4.1%, Range 0.0 –12%
Small Rock: Mean 13.5%, Range 0 – 20%
Fines: Mean 31.0%, Range 6 – 47%
Litter: Mean 50.0%, Range 25 – 93%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **6** | | | | | | | |

**Surveys Used in Description (N = 6):** C06031758, C06041711, D06051003, JAWB0016, JAWB0018, JAWB0042

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Quercus ×alvordiana* | 83 | 56.2 | 16.6 | 1.2 | 35.2 | **x** | **x** | | **x** |
| | *Pinus sabiniana* | 67 | 3.6 | 1.0 | 1.0 | 3.0 | | | | **x** |
| | *Quercus douglasii* | 33 | 24.8 | 4.9 | 4.0 | 25.2 | | | | |
| | *Juniperus californica* | 33 | 5.8 | 0.6 | 1.0 | 2.4 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Ericameria linearifolia* | 67 | 64.5 | 7.5 | 3.0 | 15.0 | | | | **x** |
| | *Ceanothus cuneatus* | 67 | 19.9 | 0.4 | 0.2 | 2.0 | | | | **x** |
| | *Eriogonum fasciculatum* | 33 | 14.7 | 2.5 | 0.2 | 15.0 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus diandrus* | 83 | 23.5 | 8.0 | 0.2 | 30.0 | **x** | | | **x** |
| | *Erodium cicutarium* | 67 | 11.7 | 5.5 | 2.0 | 23.0 | | | | **x** |
| | *Bromus rubens* | 50 | 15.1 | 9.0 | 3.0 | 36.0 | | | | **x** |
| | *Amsinckia* | 50 | 1.2 | 0.7 | 0.2 | 2.0 | | | | **x** |
| | *Bromus tectorum* | 33 | 13.5 | 10.5 | 23.0 | 40.0 | | | | |
| | *Hordeum murinum* | 33 | 13.5 | 6.7 | 10.0 | 30.0 | | | | |
| | *Poa secunda* | 33 | 3.5 | 0.7 | 2.0 | 2.0 | | | | |
| | *Descurainia pinnata* | 33 | 0.2 | 0.2 | 0.2 | 1.0 | | | | |
| | *Melica imperfecta* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Capsella bursa-pastoris* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Quercus douglasii – Juniperus californica / Ericameria linearifolia* Association

**Common Name:** Blue Oak – California Juniper / Narrowleaf Goldenbush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: 1084 m
Slope: 18°
Aspect: Northeast-facing

Tree Cover: 27%
Shrub Cover: 12%
Herb Cover: 15%

**Surface Covers:**
Large Rock: 12.2%
Small Rock: 20.2%
Fines: 40%
Litter: 25%

### Surveys Used in Description (N = 1): JAWB0042

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Quercus douglasii* | 100 | 52.6 | 4.0 | 4.0 | 4.0 | X | X | | X |
| | *Juniperus californica* | 100 | 31.6 | 2.4 | 2.4 | 2.4 | X | | X | X |
| | *Quercus ×alvordiana* | 100 | 15.8 | 1.2 | 1.2 | 1.2 | X | | | X |
| **Shrub** | | | | | | | | | | |
| | *Ericameria linearifolia* | 100 | 98.4 | 12.0 | 12.0 | 12.0 | X | X | | X |
| | *Phoradendron juniperinum* | 100 | 1.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Herb** | | | | | | | | | | |
| | *Erodium cicutarium* | 100 | 26.8 | 3.0 | 3.0 | 3.0 | X | | | X |
| | *Bromus rubens* | 100 | 26.8 | 3.0 | 3.0 | 3.0 | X | | | X |
| | *Poa secunda* | 100 | 17.9 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Bromus diandrus* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Athysanus pusillus* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Herniaria hirsuta* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Guillenia lasiophylla* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Galium aparine* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Capsella bursa-pastoris* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Amsinckia* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Lasthenia microglossa* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Bowlesia incana* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Lepidium nitidum* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Melica imperfecta* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Navarretia setiloba* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Perideridia pringlei* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Pholistoma membranaceum* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Bloomeria crocea* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Bromus hordeaceus* | 100 | 1.8 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 100 | 100. | 10.0 | 10.0 | 10.0 | X | X | | X |

## *Quercus douglasii* / *Ericameria linearifolia* Association

**Common Name:** Blue Oak / Narrowleaf Goldenbush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1298 m, Range 1226 – 1370 m
Slope: Mean 14°, Range 12 – 16°
Aspect: Variable

Tree Cover: Mean 30.3%, Range 26 – 33%
Shrub Cover: Mean 11.1%, Range 3 – 15%
Herb Cover: Mean 60.7%, Range 30 – 86%

**Surface Covers:**
Large Rock: 0%
Small Rock: Mean 10.2%, Range 0 – 20%
Fines: Mean 26.5%, Range 6 – 47%
Litter: Mean 62.5%, Range 32 – 93%

**Surveys Used in Description (N = 3):** D06051003, JAWB0016, JAWB0018

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Pinus sabiniana* | 100 | 5.4 | 1.7 | 1.0 | 3.0 | X | | | X |
| *Quercus ×alvordiana* | 67 | 55.2 | 17.7 | 23.0 | 30.0 | | | | X |
| *Quercus douglasii* | 33 | 32.1 | 8.4 | 25.2 | 25.2 | | | | |
| *Quercus chrysolepis* | 33 | 6.3 | 2.0 | 6.0 | 6.0 | | | | |
| *Juniperus californica* | 33 | 1.0 | 0.3 | 1.0 | 1.0 | | | | |
| **Shrub** | | | | | | | | | |
| *Ericameria linearifolia* | 100 | 96.2 | 11.0 | 3.0 | 15.0 | X | X | | X |
| *Ceanothus cuneatus* | 67 | 2.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Phoradendron* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| *Hesperoyucca whipplei* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| *Eriogonum fasciculatum* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | |
| *Bromus tectorum* | 67 | 26.9 | 21.0 | 23.0 | 40.0 | | | | X |
| *Bromus rubens* | 67 | 21.4 | 17.0 | 15.0 | 36.0 | | | | X |
| *Erodium cicutarium* | 67 | 13.4 | 9.3 | 5.0 | 23.0 | | | | X |
| *Amsinckia* | 67 | 1.8 | 1.3 | 2.0 | 2.0 | | | | X |
| *Bromus diandrus* | 67 | 1.3 | 1.0 | 1.0 | 2.0 | | | | X |
| *Bromus arenarius* | 33 | 22.2 | 6.7 | 20.0 | 20.0 | | | | |
| *Hordeum murinum* | 33 | 11.1 | 3.3 | 10.0 | 10.0 | | | | |
| *Poa secunda* | 33 | 1.0 | 0.7 | 2.0 | 2.0 | | | | |
| *Descurainia pinnata* | 33 | 0.4 | 0.3 | 1.0 | 1.0 | | | | |
| *Elymus elymoides* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| *Melica imperfecta* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| *Coreopsis bigelovii* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| *Corethrogyne filaginifolia* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| *Eriophyllum* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| *Phacelia cicutaria* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |

## *Quercus kelloggii* Forest Alliance

**Common Name:** California black oak forest

**NVC Alliance Code:** A3349. *Quercus chrysolepis - Quercus kelloggii* Forest & Woodland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Quercus kelloggii* / annual grass – herb | 2 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1839 m, Range 1824 – 1854 m
Slope: Mean 27°, Range 24 – 30°
Aspect: Variable

Tree Cover: Mean 36.0%, Range 31 – 41%
Shrub Cover: Mean 5.0%, Range 2 – 8%
Herb Cover: Mean 16.5%, Range 8 – 25%

**Surface Covers:**
Large Rock: Mean 14.0%, Range 13.0 –15%
Small Rock: Mean 1.2%, Range 1 – 1%
Fines: Mean 9.0%, Range 2 – 16%
Litter: Mean 72.5%, Range 68 – 77%

**Conservation Status Rank: Global** G4; **State (California)** S4

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **2** | | | | | | | |

**Surveys Used in Description (N = 2):** JAWB0212, JAWB0215

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Quercus kelloggii* | 100 | 97.6 | 35.3 | 31.2 | 39.4 | **x** | **x** | | **x** |
| | *Quercus chrysolepis* | 50 | 2.4 | 1.0 | 2.0 | 2.0 | | | | **x** |
| **Shrub** | | | | | | | | | | |
| | *Ribes roezlii* | 100 | 56.3 | 2.6 | 0.2 | 5.0 | **x** | **x** | | **x** |
| | *Frangula californica* | 50 | 18.8 | 1.5 | 3.0 | 3.0 | | | | **x** |
| | *Symphoricarpos rotundifolius* | 50 | 25.0 | 0.1 | 0.2 | 0.2 | | | | **x** |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 100 | 91.9 | 14.0 | 6.0 | 22.0 | **x** | **x** | | **x** |
| | *Erigeron foliosus* | 50 | 0.4 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Clarkia* | 50 | 1.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Clarkia rhomboidea* | 50 | 0.4 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Eriogonum nudum* | 50 | 0.4 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Gilia* | 50 | 1.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Lotus crassifolius* var. *crassifolius* | 50 | 0.4 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Penstemon rostriflorus* | 50 | 0.4 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Galium aparine* | 50 | 1.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Delphinium* | 50 | 1.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 100 | 66.7 | 2.0 | 2.0 | 2.0 | **x** | **x** | | **x** |
| | Moss | 100 | 33.3 | 1.0 | 1.0 | 1.0 | **x** | | **x** | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Quercus wislizeni* (tree) Forest Alliance

**Common Name:** Interior live oak woodland

**NVC Alliance Code:** A3348. *Quercus douglasii - Pinus sabiniana* Woodland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Quercus wislizeni* tree) (alliance) | 1 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: 1233 m
Slope: no data
Aspect: no data

Tree Cover: 3.0%
Shrub Cover: 1.0%
Herb Cover: 2.0%

**Surface Covers:**
Large Rock: no data
Small Rock: no data
Fines: no data
Litter: no data

**Conservation Status Rank: Global** G4; **State (California)** S4

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | **1** | | | | | |

**Surveys Used in Description (N = 1):** A1805241454

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Quercus wislizeni* | 100 | 100.0 | 11.0 | 11.0 | 11.0 | x | x | | x |
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 100 | 100.0 | 1.0 | 1.0 | 1.0 | x | x | | x |
| **Herb** | | | | | | | | | | |
| | *Salsola* | 100 | 55.6 | 1.0 | 1.0 | 1.0 | x | x | | x |
| | *Bromus tectorum* | 100 | 11.1 | 0.2 | 0.2 | 0.2 | x | | | x |
| | *Bromus rubens* | 100 | 11.1 | 0.2 | 0.2 | 0.2 | x | | | x |
| | *Ambrosia acanthicarpa* | 100 | 11.1 | 0.2 | 0.2 | 0.2 | x | | | x |
| | *Sphaeralcea ambigua* | 100 | 11.1 | 0.2 | 0.2 | 0.2 | x | | | x |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Salix gooddingii – Salix laevigata* Woodland Alliance

**Common Name:** Goodding's willow – red willow riparian woodlands

**NVC Alliance Code:** A3752. *Salix gooddingii - Salix laevigata* Riparian Forest Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Salix laevigata* | 4 | CEGL002952 |
| *Salix laevigata / Salix lasiolepis* | 2 | CEGL002874 |
| *Salix gooddingii* | 4 | CEGL002743 |

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1070 m, Range 796 – 1376 m
Slope: Mean 4°, Range 1 – 18°
Aspect: Mostly south-facing but variable.

Tree Cover: Mean 31.9%, Range 0 – 80%
Shrub Cover: Mean 20.5%, Range 0 – 67%
Herb Cover: Mean 30.3%, Range 8 – 67%

**Surface Covers:**
Large Rock: Mean 5.9%, Range 0.0 –48%
Small Rock: Mean 3.9%, Range 0 – 10%
Fines: Mean 23.5%, Range 3 – 68%
Litter: Mean 50.5%, Range 6 – 93%

**Conservation Status Rank: Global** G4; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | **4** | **2** | | | | **4** |

**Surveys Used in Description (N = 10):** C1805241820, DEVA9155, DEVA9373, DEVA9466, DEVA9538, DEVA9921, DEVAS079, OWVA0014, OWVA0025, OWVA0042

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Salix laevigata* | 60 | 57.4 | 20.8 | 11.0 | 60.0 | | | | **x** |
| | *Salix gooddingii* | 50 | 39.5 | 10.2 | 2.0 | 50.0 | | | | **x** |
| | *Populus fremontii* | 30 | 0.8 | 0.1 | 0.2 | 1.0 | | | | |
| | *Prosopis glandulosa* | 20 | 1.9 | 0.3 | 0.2 | 3.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Salix gooddingii* Association

**Common Name:** Black Willow Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1123 m, Range 831 – 1368 m
Slope: Mean 7°, Range 1 – 18°
Aspect: West-facing

Tree Cover: Mean 33.3%, Range 10 – 80%
Shrub Cover: Mean 19.0%, Range 8 – 40%
Herb Cover: Mean 45.5%, Range 23 – 67%

**Surface Covers:**
Large Rock: Mean 0.9%, Range 0.0 –3%
Small Rock: Mean 3.5%, Range 0 – 10%
Fines: Mean 39.5%, Range 5 – 68%
Litter: Mean 43.6%, Range 6 – 93%

**Surveys Used in Description (N = 4):** DEVA9466, DEVA9538, DEVA9921, OWVA0042

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Salix gooddingii* | 100 | 94.9 | 25.0 | 10.0 | 50.0 | X | X | | X |
| *Prosopis glandulosa* | 50 | 4.6 | 0.8 | 0.2 | 3.0 | | | | X |
| *Washingtonia filifera* | 25 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| **Shrub** | | | | | | | | | |
| *Ericameria nauseosa* | 50 | 5.7 | 1.3 | 2.0 | 3.0 | | | | X |
| *Suaeda moquinii* | 50 | 2.5 | 0.8 | 0.2 | 3.0 | | | | X |
| *Fraxinus anomala* | 25 | 17.9 | 7.5 | 30.0 | 30.0 | | | | |
| *Atriplex polycarpa* | 25 | 12.6 | 5.0 | 20.0 | 20.0 | | | | |
| *Baccharis sergiloides* | 25 | 9.4 | 3.8 | 15.0 | 15.0 | | | | |
| *Forestiera pubescens* | 25 | 6.0 | 2.5 | 10.0 | 10.0 | | | | |
| *Vitis girdiana* | 25 | 15.1 | 2.5 | 10.0 | 10.0 | | | | |
| *Atriplex torreyi* | 25 | 15.1 | 1.3 | 5.0 | 5.0 | | | | |
| *Pluchea sericea* | 25 | 6.0 | 0.5 | 2.0 | 2.0 | | | | |
| *Brickellia longifolia* | 25 | 3.0 | 0.5 | 2.0 | 2.0 | | | | |
| *Atriplex hymenelytra* | 25 | 0.6 | 0.3 | 1.0 | 1.0 | | | | |
| *Salix exigua* | 25 | 1.5 | 0.3 | 1.0 | 1.0 | | | | |
| *Atriplex confertifolia* | 25 | 0.3 | 0.1 | 0.5 | 0.5 | | | | |
| *Viguiera reticulata* | 25 | 1.5 | 0.1 | 0.5 | 0.5 | | | | |
| *Gutierrezia sarothrae* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| *Eriogonum fasciculatum* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| *Eucnide urens* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| *Artemisia tridentata* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| *Tetradymia axillaris* | 25 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |
| *Encelia actonii* | 25 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |
| *Lycium cooperi* | 25 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Anemopsis californica* | 75 | 15.4 | 10.2 | 0.2 | 40.0 | X | | | X |
| | *Phragmites australis* | 50 | 26.7 | 15.8 | 3.0 | 60.0 | | | | X |
| | *Melilotus* | 50 | 9.0 | 2.8 | 5.0 | 6.0 | | | | X |
| | *Bromus rubens* | 50 | 6.0 | 1.3 | 0.2 | 5.0 | | | | X |
| | *Eriogonum inflatum* | 50 | 0.4 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Eleocharis rostellata* | 25 | 11.5 | 3.3 | 13.0 | 13.0 | | | | |
| | *Carex praegracilis* | 25 | 3.7 | 2.5 | 10.0 | 10.0 | | | | |
| | *Schoenoplectus pungens* | 25 | 3.7 | 2.5 | 10.0 | 10.0 | | | | |
| | *Eleocharis* | 25 | 8.3 | 1.8 | 7.0 | 7.0 | | | | |
| | *Heliotropium curassavicum* | 25 | 3.5 | 1.0 | 4.0 | 4.0 | | | | |
| | *Lythrum californicum* | 25 | 1.8 | 0.5 | 2.0 | 2.0 | | | | |
| | *Lotus corniculatus* | 25 | 0.7 | 0.5 | 2.0 | 2.0 | | | | |
| | Graminoid (grass or grasslike) | 25 | 0.9 | 0.3 | 1.0 | 1.0 | | | | |
| | *Juncus xiphioides* | 25 | 1.2 | 0.3 | 1.0 | 1.0 | | | | |
| | *Distichlis spicata* | 25 | 0.9 | 0.3 | 1.0 | 1.0 | | | | |
| | *Schoenoplectus americanus* | 25 | 0.9 | 0.3 | 1.0 | 1.0 | | | | |
| | *Solidago* | 25 | 0.9 | 0.3 | 1.0 | 1.0 | | | | |
| | *Muhlenbergia asperifolia* | 25 | 0.2 | 0.1 | 0.5 | 0.5 | | | | |
| | Forb (herbaceous, not grass nor grasslike) | 25 | 0.6 | 0.1 | 0.5 | 0.5 | | | | |
| | *Polypogon interruptus* | 25 | 0.4 | 0.1 | 0.5 | 0.5 | | | | |
| | *Juncus mexicanus* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Erodium cicutarium* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum rixfordii* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Oligomeris linifolia* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Phacelia* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Pectocarya* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Descurainia pinnata* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Draba cuneifolia* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Descurainia sophia* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Leymus cinereus* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Amsinckia* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus tectorum* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Camissonia* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Chorizanthe rigida* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cryptantha* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Senecio flaccidus* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Claytonia perfoliata* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Salvia columbariae* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cirsium mohavense* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Stanleya* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Algae | 25 | 25.0 | 0.3 | 1.0 | 1.0 | | | | |
| | Moss | 25 | 25.0 | 0.1 | 0.2 | 0.2 | | | | |

## *Salix laevigata* Association

**Common Name:** Red Willow Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 964 m, Range 796 – 1376 m
Slope: Mean 2°, Range 1 – 4°
Aspect: Variable

Tree Cover: Mean 39.5%, Range 0 – 62%
Shrub Cover: Mean 8.0%, Range 0 – 19%
Herb Cover: Mean 20.8%, Range 8 – 38%

**Surface Covers:**
Large Rock: Mean 12.3%, Range 0.0 –48%
Small Rock: Mean 3.0%, Range 0 – 10%
Fines: Mean 8.8%, Range 3 – 16%
Litter: Mean 53.8%, Range 19 – 84%

**Surveys Used in Description (N = 4):** DEVA9155, DEVA9373, DEVAS079, OWVA0025

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Salix laevigata* | 100 | 99.1 | 45.3 | 25.0 | 60.0 | X | X | | X |
| *Populus angustifolia* | 25 | 0.8 | 0.5 | 2.0 | 2.0 | | | | |
| *Populus fremontii* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| **Shrub** | | | | | | | | | |
| *Baccharis salicifolia* | 50 | 49.3 | 17.1 | 0.2 | 68.0 | | | | X |
| *Eriogonum fasciculatum* | 50 | 0.3 | 0.1 | 0.1 | 0.2 | | | | X |
| *Pluchea sericea* | 25 | 18.6 | 3.8 | 15.0 | 15.0 | | | | |
| *Salix lasiolepis* | 25 | 9.8 | 1.0 | 4.0 | 4.0 | | | | |
| *Atriplex polycarpa* | 25 | 3.7 | 0.8 | 3.0 | 3.0 | | | | |
| *Forestiera pubescens* | 25 | 7.4 | 0.8 | 3.0 | 3.0 | | | | |
| *Salix exigua* | 25 | 2.5 | 0.3 | 1.0 | 1.0 | | | | |
| *Pleurocoronis pluriseta* | 25 | 0.4 | 0.3 | 1.0 | 1.0 | | | | |
| *Ericameria nauseosa* | 25 | 2.5 | 0.3 | 1.0 | 1.0 | | | | |
| *Ambrosia dumosa* | 25 | 1.2 | 0.3 | 1.0 | 1.0 | | | | |
| *Ribes aureum* | 25 | 2.5 | 0.3 | 1.0 | 1.0 | | | | |
| *Encelia farinosa* | 25 | 0.2 | 0.1 | 0.5 | 0.5 | | | | |
| *Hymenoclea salsola* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Baccharis sergiloides* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Stephanomeria pauciflora* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Larrea tridentata* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Rosa woodsii* | 25 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| *Lycium andersonii* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Echinocereus engelmannii* | 25 | 0.0 | 0.0 | 0.1 | 0.1 | | | | |
| *Opuntia basilaris* | 25 | 0.0 | 0.0 | 0.1 | 0.1 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Nasturtium officinale* | 75 | 20.7 | 5.4 | 0.5 | 20.0 | X | | | X |
| | *Typha* | 50 | 10.5 | 1.6 | 3.0 | 3.5 | | | | X |
| | *Bromus rubens* | 50 | 11.6 | 1.5 | 1.0 | 5.0 | | | | X |
| | *Anemopsis californica* | 25 | 22.9 | 8.8 | 35.0 | 35.0 | | | | |
| | *Phragmites australis* | 25 | 9.4 | 1.3 | 5.0 | 5.0 | | | | |
| | *Bromus tectorum* | 25 | 6.6 | 0.8 | 3.0 | 3.0 | | | | |
| | *Cynodon dactylon* | 25 | 4.4 | 0.5 | 2.0 | 2.0 | | | | |
| | *Schismus* | 25 | 3.8 | 0.5 | 2.0 | 2.0 | | | | |
| | *Schoenoplectus americanus* | 25 | 1.9 | 0.5 | 2.0 | 2.0 | | | | |
| | *Glycyrrhiza lepidota* | 25 | 0.7 | 0.3 | 1.0 | 1.0 | | | | |
| | *Adiantum capillus-veneris* | 25 | 0.9 | 0.3 | 1.0 | 1.0 | | | | |
| | *Sporobolus airoides* | 25 | 0.9 | 0.1 | 0.5 | 0.5 | | | | |
| | *Mimulus guttatus* | 25 | 1.1 | 0.1 | 0.5 | 0.5 | | | | |
| | Forb (herbaceous, not grass nor grasslike) | 25 | 0.7 | 0.1 | 0.3 | 0.3 | | | | |
| | *Carex* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Maianthemum stellatum* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum inflatum* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Juncus mexicanus* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Berula erecta* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Polypogon interruptus* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Stachys albens* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Symphoricarpos* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Urtica* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Phacelia vallis-mortae* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Amsinckia* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Sphaeralcea ambigua* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Polypogon monspeliensis* | 25 | 0.2 | 0.0 | 0.1 | 0.1 | | | | |
| | *Sporobolus* | 25 | 0.2 | 0.0 | 0.1 | 0.1 | | | | |
| | *Veronica americana* | 25 | 0.2 | 0.0 | 0.1 | 0.1 | | | | |
| | *Lactuca* | 25 | 0.2 | 0.0 | 0.1 | 0.1 | | | | |
| | Graminoid (grass or grasslike) | 25 | 0.2 | 0.0 | 0.1 | 0.1 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Algae | 25 | 25.0 | 0.5 | 2.0 | 2.0 | | | | |
| | Moss | 25 | 25.0 | 0.1 | 0.2 | 0.2 | | | | |

## *Salix laevigata / Salix lasiolepis* Association

**Common Name:** Red Willow / Arroyo Willow Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1175 m, Range 1154 – 1195 m
Slope: 2°
Aspect: Variable

Tree Cover: Mean 14.0%, Range 11 – 17%
Shrub Cover: Mean 48.5%, Range 30 – 67%
Herb Cover: Mean 19.0%, Range 18 – 20%

**Surface Covers:**
Large Rock: 0.4%
Small Rock: 9%
Fines: 18%
Litter: 65%

**Surveys Used in Description (N = 2):** C1805241820, OWVA0014

**Association Stand Table:**

| Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Salix laevigata* | 100 | 88.7 | 13.5 | 11.0 | 16.0 | X | X | | X |
| *Populus fremontii* | 100 | 3.7 | 0.6 | 0.2 | 1.0 | X | | | X |
| *Salix gooddingii* | 50 | 7.6 | 1.0 | 2.0 | 2.0 | | | | X |
| **Shrub** | | | | | | | | | |
| *Salix lasiolepis* | 100 | 61.2 | 35.0 | 10.0 | 60.0 | X | X | | X |
| *Ericameria nauseosa* | 100 | 16.8 | 5.1 | 0.2 | 10.0 | X | | | X |
| *Salix exigua* | 100 | 2.4 | 1.0 | 1.0 | 1.0 | X | | | X |
| *Tamarix ramosissima* | 50 | 8.3 | 2.5 | 5.0 | 5.0 | | | | X |
| *Forestiera pubescens* | 50 | 3.0 | 2.0 | 4.0 | 4.0 | | | | X |
| *Atriplex torreyi* | 50 | 6.7 | 2.0 | 4.0 | 4.0 | | | | X |
| *Garrya flavescens* | 50 | 1.5 | 1.0 | 2.0 | 2.0 | | | | X |
| *Artemisia tridentata* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | X |
| **Herb** | | | | | | | | | |
| *Anemopsis californica* | 100 | 5.6 | 1.0 | 1.0 | 1.0 | X | | | X |
| *Distichlis spicata* | 50 | 37.5 | 7.5 | 15.0 | 15.0 | | | | X |
| *Phragmites australis* | 50 | 30.9 | 5.0 | 10.0 | 10.0 | | | | X |
| *Sporobolus airoides* | 50 | 7.5 | 1.5 | 3.0 | 3.0 | | | | X |
| *Schoenoplectus acutus* | 50 | 9.3 | 1.5 | 3.0 | 3.0 | | | | X |
| *Juncus mexicanus* | 50 | 2.5 | 0.5 | 1.0 | 1.0 | | | | X |
| *Leymus triticoides* | 50 | 3.1 | 0.5 | 1.0 | 1.0 | | | | X |
| *Nasturtium officinale* | 50 | 3.1 | 0.5 | 1.0 | 1.0 | | | | X |
| *Epipactis gigantea* | 50 | 0.6 | 0.1 | 0.2 | 0.2 | | | | X |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 50 | 6.6 | 1.6 | 0.2 | 10.0 | | | | **x** |
| | *Salix exigua* | 40 | 2.1 | 0.4 | 1.0 | 1.0 | | | | |
| | *Salix lasiolepis* | 30 | 16.2 | 7.4 | 4.0 | 60.0 | | | | |
| | *Forestiera pubescens* | 30 | 5.9 | 1.7 | 3.0 | 10.0 | | | | |
| | *Eriogonum fasciculatum* | 30 | 0.2 | 0.1 | 0.1 | 0.2 | | | | |
| | *Baccharis salicifolia* | 20 | 19.7 | 6.8 | 0.2 | 68.0 | | | | |
| | *Atriplex polycarpa* | 20 | 6.5 | 2.3 | 3.0 | 20.0 | | | | |
| | *Pluchea sericea* | 20 | 9.8 | 1.7 | 2.0 | 15.0 | | | | |
| | *Baccharis sergiloides* | 20 | 3.9 | 1.5 | 0.2 | 15.0 | | | | |
| | *Atriplex torreyi* | 20 | 7.4 | 0.9 | 4.0 | 5.0 | | | | |
| | *Suaeda moquinii* | 20 | 1.0 | 0.3 | 0.2 | 3.0 | | | | |
| | *Artemisia tridentata* | 20 | 0.2 | 0.0 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Anemopsis californica* | 60 | 16.4 | 7.8 | 0.2 | 40.0 | | | | **x** |
| | *Phragmites australis* | 40 | 20.6 | 7.8 | 3.0 | 60.0 | | | | |
| | *Nasturtium officinale* | 40 | 8.9 | 2.3 | 0.5 | 20.0 | | | | |
| | *Bromus rubens* | 40 | 7.0 | 1.1 | 0.2 | 5.0 | | | | |
| | *Juncus mexicanus* | 30 | 0.6 | 0.1 | 0.2 | 1.0 | | | | |
| | *Eriogonum inflatum* | 30 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Distichlis spicata* | 20 | 7.9 | 1.6 | 1.0 | 15.0 | | | | |
| | *Melilotus* | 20 | 3.6 | 1.1 | 5.0 | 6.0 | | | | |
| | *Typha* | 20 | 4.2 | 0.7 | 3.0 | 3.5 | | | | |
| | *Sporobolus airoides* | 20 | 1.9 | 0.4 | 0.5 | 3.0 | | | | |
| | *Bromus tectorum* | 20 | 2.7 | 0.3 | 0.2 | 3.0 | | | | |
| | *Schoenoplectus americanus* | 20 | 1.1 | 0.3 | 1.0 | 2.0 | | | | |
| | Graminoid (grass or grasslike) | 20 | 0.5 | 0.1 | 0.1 | 1.0 | | | | |
| | Forb (herbaceous, not grass nor grasslike) | 20 | 0.5 | 0.1 | 0.3 | 0.5 | | | | |
| | *Polypogon interruptus* | 20 | 0.3 | 0.1 | 0.2 | 0.5 | | | | |
| | *Amsinckia* | 20 | 0.2 | 0.0 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Algae | 20 | 20.0 | 0.3 | 1.0 | 2.0 | | | | |
| | Moss | 20 | 20.0 | 0.0 | 0.2 | 0.2 | | | | |

## *Yucca brevifolia* Woodland Alliance

**Common Name:** Joshua tree woodland

**NVC Alliance Code:** A3148. *Yucca brevifolia* Wooded Scrub Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Yucca brevifolia / Lycium andersonii – Ephedra nevadensis* | 18 | CEGL005778 |
| *Yucca brevifolia* (alliance) | 2 | A3148 |
| *Yucca brevifolia / (Prunus fasciculata – Salazaria mexicana)* | 1 | CEGL005776 |
| *Yucca brevifolia / Coleogyne ramosissima* | 8 | CEGL005294 |

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1633 m, Range 1100 – 2087 m
Slope: Mean 9°, Range 1 – 29°
Aspect: Variable

Tree Cover: Mean 3.6%, Range 0 – 16%
Shrub Cover: Mean 17.5%, Range 5 – 45%
Herb Cover: Mean 6.8%, Range 0 – 24%

**Surface Covers:**
Large Rock: Mean 7.3%, Range 0.0 –43%
Small Rock: Mean 55.0%, Range 0 – 98%
Fines: Mean 26.1%, Range 0 – 82%
Litter: Mean 4.0%, Range 0 – 20%

**Conservation Status Rank: Global** G4; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **2** | **1** | **1** | **1** | | | | | **24** |

**Surveys Used in Description (N = 29):** DEVA0144, DEVA0149, DEVA0236, DEVA9227, DEVA9241, DEVA9326, DEVA9453, DEVA9568, DEVA9572, DEVA9907, DEVAD175, DEVAS054, DEVAS058, DEVAS090, DEVAS124, JAWB0001, JAWB0009, JAWB0103, MOJC0524, MOJC0525, MOJC0598, MOJC0657, MOJC0659, MOJC0760, MOJC1091, OWVA0041, SLTN0639, SLTN0869, SLTN1039

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Yucca brevifolia* | 100 | 97.0 | 4.0 | 0.7 | 15.0 | **x** | **x** | | **x** |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ephedra nevadensis* | 83 | 7.3 | 1.2 | 0.1 | 4.0 | **x** | | | **x** |
| | *Menodora spinescens* | 72 | 18.5 | 3.0 | 0.1 | 10.0 | | | | **x** |
| | *Lycium andersonii* | 72 | 6.6 | 1.0 | 0.1 | 3.0 | | | | **x** |
| | *Krascheninnikovia lanata* | 69 | 3.9 | 0.7 | 0.1 | 5.0 | | | | **x** |
| | *Atriplex confertifolia* | 62 | 5.7 | 1.0 | 0.1 | 8.0 | | | | **x** |
| | *Cylindropuntia echinocarpa* | 55 | 1.3 | 0.3 | 0.1 | 2.0 | | | | **x** |
| | *Tetradymia axillaris* | 52 | 1.6 | 0.4 | 0.1 | 5.0 | | | | **x** |
| | *Opuntia basilaris* | 48 | 0.9 | 0.2 | 0.1 | 0.5 | | | | |
| | *Coleogyne ramosissima* | 45 | 12.9 | 3.2 | 0.1 | 22.0 | | | | |
| | *Eriogonum fasciculatum* | 45 | 4.2 | 0.8 | 0.2 | 5.0 | | | | |
| | *Hymenoclea salsola* | 41 | 5.7 | 1.3 | 0.1 | 12.0 | | | | |
| | *Psorothamnus arborescens* | 41 | 1.7 | 0.3 | 0.1 | 3.0 | | | | |
| | *Picrothamnus desertorum* | 34 | 1.3 | 0.2 | 0.1 | 2.0 | | | | |
| | *Xylorhiza tortifolia* | 34 | 0.9 | 0.1 | 0.1 | 1.0 | | | | |
| | *Grayia spinosa* | 31 | 4.6 | 1.0 | 0.2 | 9.0 | | | | |
| | *Echinocereus engelmannii* | 24 | 0.3 | 0.0 | 0.1 | 0.5 | | | | |
| | *Atriplex canescens* | 21 | 0.8 | 0.1 | 0.2 | 1.0 | | | | |
| | *Acamptopappus shockleyi* | 21 | 0.7 | 0.1 | 0.1 | 1.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 62 | 16.4 | 1.6 | 0.1 | 15.0 | | | | **x** |
| | *Sphaeralcea ambigua* | 48 | 4.9 | 0.2 | 0.1 | 0.5 | | | | |
| | *Achnatherum speciosum* | 41 | 4.0 | 0.1 | 0.1 | 1.0 | | | | |
| | *Eriogonum inflatum* | 41 | 4.6 | 0.1 | 0.1 | 1.0 | | | | |
| | *Achnatherum hymenoides* | 38 | 4.2 | 0.2 | 0.1 | 2.0 | | | | |
| | *Pleuraphis jamesii* | 34 | 5.2 | 0.3 | 0.2 | 3.0 | | | | |
| | *Stanleya* | 31 | 2.5 | 0.1 | 0.1 | 1.0 | | | | |
| | *Amsinckia* | 24 | 1.3 | 0.1 | 0.1 | 1.0 | | | | |
| | *Cryptantha* | 24 | 0.9 | 0.0 | 0.1 | 0.2 | | | | |
| | *Bromus tectorum* | 21 | 2.8 | 0.2 | 0.1 | 4.0 | | | | |
| | *Oxytheca perfoliata* | 21 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| | *Delphinium* | 21 | 0.8 | 0.0 | 0.1 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | *Cryptogammic crust* | 28 | 25.5 | 0.2 | 0.2 | 2.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Yucca brevifolia* / *(Prunus fasciculata – Salazaria mexicana)* Association

**Common Name:** Joshua Tree / (Desert Almond – Bladdersage) Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: 1344 m
Slope: 9°
Aspect: Northeast-facing

Tree Cover: 8%
Shrub Cover: 45%
Herb Cover: 12%

**Surface Covers:**
Large Rock: 3%
Small Rock: 60%
Fines: 20%
Litter: 0%

**Surveys Used in Description (N = 1):** SLTN0869

**Association Stand Table:**

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Yucca brevifolia* | 100 | 100. | 8.5 | 8.5 | 8.5 | X | X | | X |
| **Shrub** | | | | | | | | | |
| *Salazaria mexicana* | 100 | 34.6 | 15.0 | 15.0 | 15.0 | X | | X | X |
| *Hymenoclea salsola* | 100 | 27.7 | 12.0 | 12.0 | 12.0 | X | | | X |
| *Gutierrezia microcephala* | 100 | 18.5 | 8.0 | 8.0 | 8.0 | X | | | X |
| *Ericameria teretifolia* | 100 | 4.6 | 2.0 | 2.0 | 2.0 | X | | | X |
| *Ericameria linearifolia* | 100 | 4.6 | 2.0 | 2.0 | 2.0 | X | | | X |
| *Eriogonum fasciculatum* | 100 | 2.3 | 1.0 | 1.0 | 1.0 | X | | | X |
| *Ericameria cooperi* | 100 | 2.3 | 1.0 | 1.0 | 1.0 | X | | | X |
| *Salvia dorrii* | 100 | 2.3 | 1.0 | 1.0 | 1.0 | X | | | X |
| *Ephedra nevadensis* | 100 | 2.3 | 1.0 | 1.0 | 1.0 | X | | | X |
| *Artemisia tridentata* | 100 | 0.2 | 0.1 | 0.1 | 0.1 | X | | | X |
| *Tetradymia stenolepis* | 100 | 0.2 | 0.1 | 0.1 | 0.1 | X | | | X |
| *Penstemon incertus* | 100 | 0.2 | 0.1 | 0.1 | 0.1 | X | | | X |
| **Herb** | | | | | | | | | |
| *Poa secunda* | 100 | 65.0 | 8.0 | 8.0 | 8.0 | X | X | | X |
| *Bromus tectorum* | 100 | 32.5 | 4.0 | 4.0 | 4.0 | X | | X | X |
| *Amsinckia* | 100 | 0.8 | 0.1 | 0.1 | 0.1 | X | | | X |
| *Cryptantha* | 100 | 0.8 | 0.1 | 0.1 | 0.1 | X | | | X |
| Forb (herbaceous, not grass nor grasslike) | 100 | 0.8 | 0.1 | 0.1 | 0.1 | X | | | X |

## *Yucca brevifolia / Coleogyne ramosissima* Association

**Common Name:** Joshua Tree / Blackbush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1704 m, Range 1270 – 2076 m
Slope: Mean 9°, Range 2 – 24°
Aspect: East-facing

Tree Cover: Mean 5.2%, Range 2 – 16%
Shrub Cover: Mean 21.8%, Range 7 – 41%
Herb Cover: Mean 7.1%, Range 0 – 20%

**Surface Covers:**
Large Rock: Mean 3.7%, Range 0.0 –23%
Small Rock: Mean 42.7%, Range 0 – 94%
Fines: Mean 35.8%, Range 2 – 63%
Litter: Mean 5.2%, Range 0 – 20%

**Surveys Used in Description (N = 8):** DEVA0149, DEVA0236, DEVA9572, DEVAD175, JAWB0103, MOJC0657, MOJC0659, MOJC0760

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Yucca brevifolia* | 100 | 98.9 | 5.1 | 2.0 | 15.0 | X | X | | X |
| **Shrub** | | | | | | | | | | |
| | *Coleogyne ramosissima* | 100 | 43.2 | 11.0 | 4.0 | 22.0 | X | | X | X |
| | *Ephedra nevadensis* | 88 | 6.1 | 1.4 | 1.0 | 3.0 | X | | | X |
| | *Menodora spinescens* | 75 | 8.7 | 2.7 | 0.2 | 10.0 | X | | | X |
| | *Eriogonum fasciculatum* | 75 | 2.0 | 0.4 | 0.2 | 1.0 | X | | | X |
| | *Atriplex confertifolia* | 63 | 3.3 | 0.8 | 0.5 | 3.0 | | | | X |
| | *Tetradymia axillaris* | 63 | 0.9 | 0.3 | 0.1 | 1.0 | | | | X |
| | *Krascheninnikovia lanata* | 63 | 0.8 | 0.2 | 0.1 | 0.5 | | | | X |
| | *Hymenoclea salsola* | 50 | 5.1 | 1.1 | 0.5 | 6.0 | | | | X |
| | *Grayia spinosa* | 50 | 4.6 | 0.9 | 1.0 | 4.0 | | | | X |
| | *Cylindropuntia echinocarpa* | 50 | 1.1 | 0.3 | 0.2 | 1.0 | | | | X |
| | *Psorothamnus arborescens* | 38 | 1.5 | 0.5 | 0.2 | 3.0 | | | | |
| | *Lycium andersonii* | 38 | 1.6 | 0.3 | 0.2 | 2.0 | | | | |
| | *Opuntia basilaris* | 38 | 0.8 | 0.2 | 0.5 | 0.5 | | | | |
| | *Artemisia tridentata* | 38 | 0.6 | 0.1 | 0.2 | 0.5 | | | | |
| | *Ericameria cooperi* | 25 | 3.4 | 0.6 | 1.0 | 4.0 | | | | |
| | *Lycium pallidum* | 25 | 2.3 | 0.6 | 2.0 | 3.0 | | | | |
| | *Tetradymia stenolepis* | 25 | 1.1 | 0.3 | 1.0 | 1.5 | | | | |
| | *Atriplex canescens* | 25 | 0.7 | 0.2 | 0.5 | 1.0 | | | | |
| | *Amphipappus fremontii* | 25 | 0.7 | 0.2 | 0.5 | 1.0 | | | | |
| | *Gutierrezia microcephala* | 25 | 0.6 | 0.1 | 0.5 | 0.5 | | | | |
| | *Picrothamnus desertorum* | 25 | 0.4 | 0.1 | 0.2 | 0.5 | | | | |
| | *Echinocereus engelmannii* | 25 | 0.4 | 0.1 | 0.1 | 0.5 | | | | |
| | *Xylorhiza tortifolia* | 25 | 0.2 | 0.0 | 0.1 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 88 | 30.1 | 3.4 | 0.5 | 15.0 | X | | X | X |
| | *Pleuraphis jamesii* | 50 | 6.4 | 0.4 | 0.5 | 2.0 | | | | X |
| | *Sphaeralcea ambigua* | 50 | 6.5 | 0.2 | 0.1 | 0.5 | | | | X |
| | *Achnatherum speciosum* | 50 | 1.1 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Achnatherum hymenoides* | 38 | 5.6 | 0.3 | 0.2 | 2.0 | | | | |
| | *Stanleya* | 38 | 2.6 | 0.2 | 0.2 | 1.0 | | | | |
| | *Elymus elymoides* | 38 | 2.7 | 0.2 | 0.2 | 0.5 | | | | |
| | *Eriogonum maculatum* | 38 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Oxytheca perfoliata* | 38 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cymopterus purpurascens* | 25 | 2.4 | 0.1 | 0.5 | 0.5 | | | | |
| | *Arabis pulchra* | 25 | 2.4 | 0.1 | 0.5 | 0.5 | | | | |
| | *Castilleja angustifolia* | 25 | 1.3 | 0.1 | 0.2 | 0.5 | | | | |
| | *Mentzelia albicaulis* | 25 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Phacelia fremontii* | 25 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriophyllum* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum nidularium* | 25 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Amsinckia* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Delphinium* | 25 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cryptantha* | 25 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Astragalus* | 25 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Phacelia vallis-mortae* | 25 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |

## *Yucca brevifolia / Lycium andersonii – Ephedra nevadensis* Association

**Common Name:** Joshua Tree / Anderson's Wolfberry – Nevada Ephedra Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1673 m, Range 1226 – 2087 m
Slope: Mean 10°, Range 1 – 29°
Aspect: Variable

Tree Cover: Mean 2.8%, Range 0 – 15%
Shrub Cover: Mean 12.7%, Range 5 – 40%
Herb Cover: Mean 6.3%, Range 0 – 24%

**Surface Covers:**
Large Rock: Mean 9.8%, Range 0.0 –43%
Small Rock: Mean 62.6%, Range 10 – 98%
Fines: Mean 18.6%, Range 0 – 66%
Litter: Mean 3.7%, Range 0 – 20%

**Surveys Used in Description (N = 18):** DEVA0144, DEVA9227, DEVA9241, DEVA9326, DEVA9453, DEVA9568, DEVA9907, DEVAS054, DEVAS058, DEVAS090, DEVAS124, JAWB0009, MOJC0524, MOJC0525, MOJC0598, MOJC1091, SLTN0639, SLTN1039

### Association Stand Table:

| Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Yucca brevifolia* | 100 | 95.9 | 3.3 | 0.7 | 15.0 | X | X | | X |
| **Shrub** | | | | | | | | | |
| *Lycium andersonii* | 89 | 9.5 | 1.2 | 0.1 | 3.0 | X | | | X |
| *Menodora spinescens* | 83 | 26.0 | 3.7 | 0.1 | 10.0 | X | | | X |
| *Ephedra nevadensis* | 83 | 8.6 | 1.2 | 0.1 | 4.0 | X | | | X |
| *Krascheninnikovia lanata* | 78 | 5.5 | 0.8 | 0.1 | 5.0 | X | | | X |
| *Atriplex confertifolia* | 72 | 7.7 | 1.2 | 0.1 | 8.0 | | | | X |
| *Cylindropuntia echinocarpa* | 61 | 1.1 | 0.2 | 0.1 | 1.0 | | | | X |
| *Tetradymia axillaris* | 56 | 2.2 | 0.5 | 0.1 | 5.0 | | | | X |
| *Opuntia basilaris* | 56 | 1.0 | 0.2 | 0.1 | 0.5 | | | | X |
| *Psorothamnus arborescens* | 50 | 2.0 | 0.2 | 0.1 | 1.0 | | | | X |
| *Picrothamnus desertorum* | 44 | 1.9 | 0.3 | 0.1 | 2.0 | | | | |
| *Xylorhiza tortifolia* | 44 | 1.4 | 0.2 | 0.2 | 1.0 | | | | |
| *Hymenoclea salsola* | 33 | 2.6 | 0.5 | 0.1 | 5.0 | | | | |
| *Grayia spinosa* | 28 | 5.5 | 1.2 | 0.2 | 9.0 | | | | |
| *Eriogonum fasciculatum* | 28 | 4.4 | 0.8 | 0.5 | 5.0 | | | | |
| *Coleogyne ramosissima* | 28 | 1.6 | 0.3 | 0.1 | 2.0 | | | | |
| *Acamptopappus shockleyi* | 28 | 1.2 | 0.1 | 0.2 | 1.0 | | | | |
| *Echinocereus engelmannii* | 28 | 0.4 | 0.0 | 0.1 | 0.2 | | | | |
| *Ambrosia dumosa* | 22 | 2.8 | 0.4 | 0.2 | 4.0 | | | | |
| *Lepidium fremontii* | 22 | 1.5 | 0.1 | 0.2 | 2.0 | | | | |
| *Atriplex canescens* | 22 | 0.9 | 0.1 | 0.2 | 1.0 | | | | |
| *Echinocactus polycephalus* | 22 | 0.6 | 0.1 | 0.1 | 0.5 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Eriogonum inflatum* | 61 | 6.0 | 0.1 | 0.1 | 1.0 | | | | X |
| | *Bromus rubens* | 56 | 12.9 | 1.1 | 0.1 | 15.0 | | | | X |
| | *Sphaeralcea ambigua* | 56 | 5.1 | 0.2 | 0.1 | 0.5 | | | | X |
| | *Achnatherum speciosum* | 44 | 5.9 | 0.2 | 0.1 | 1.0 | | | | |
| | *Achnatherum hymenoides* | 44 | 4.4 | 0.1 | 0.1 | 0.5 | | | | |
| | *Pleuraphis jamesii* | 33 | 5.5 | 0.3 | 0.2 | 3.0 | | | | |
| | *Stanleya* | 33 | 2.8 | 0.1 | 0.1 | 0.5 | | | | |
| | *Chorizanthe rigida* | 28 | 3.7 | 0.0 | 0.1 | 0.2 | | | | |
| | *Castilleja* | 28 | 1.8 | 0.0 | 0.1 | 0.2 | | | | |
| | *Bromus tectorum* | 22 | 2.0 | 0.1 | 0.1 | 0.5 | | | | |
| | *Chaenactis* | 22 | 1.3 | 0.0 | 0.1 | 0.2 | | | | |
| | *Gilia* | 22 | 1.5 | 0.0 | 0.1 | 0.2 | | | | |
| | *Delphinium* | 22 | 1.0 | 0.0 | 0.1 | 0.2 | | | | |
| | *Cryptantha* | 22 | 1.1 | 0.0 | 0.1 | 0.2 | | | | |
| | *Eriogonum* | 22 | 2.5 | 0.0 | 0.1 | 0.2 | | | | |
| | *Phacelia* | 22 | 1.8 | 0.0 | 0.1 | 0.1 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Cryptogammic crust | 39 | 35.6 | 0.3 | 0.2 | 2.0 | | | | |

## 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 / Distichlis spicata* | 14 | CEPP005788 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 424 m, Range 29 – 1284 m
Slope: Mean 1°, Range 0 – 1°
Aspect: Variable

Tree Cover: Mean 0.1%, Range 0 – 0.2%
Shrub Cover: Mean 17.3%, Range 3 – 42%
Herb Cover: Mean 17.4%, Range 5 – 84%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0.1%, Range 0 – 0.2%
Fines: Mean 53.8%, Range 6 – 88%
Litter: Mean 40.1%, Range 0 – 91%

**Conservation Status Rank: Global** G4; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | | **9** | **3** | **1** | | **1** |

**Surveys Used in Description (N = 14):** DEVA8063, DEVA8064, DEVA8065, DEVA8066, DEVA8067, DEVA8068, DEVA8069, DEVA8070, DEVA9812, FISH0004, LAW030_a, MOJC0054, RYE1211061306, RYE1211061443

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Allenrolfea occidentalis* | 100 | 95.0 | 17.2 | 3.0 | 42.0 | **x** | **x** | | **x** |
| **Herb** | | | | | | | | | | |
| | *Distichlis spicata* | 100 | 81.0 | 9.6 | 5.0 | 18.0 | **x** | **x** | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *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* | 17 | CEGL005074 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1068 m, Range 308 – 1733 m
Slope: Mean 16°, Range 2 – 35°
Aspect: Variable

Tree Cover: Mean 0.1%, Range 0 – 1%
Shrub Cover: Mean 14.8%, Range 2 – 35%
Herb Cover: Mean 8.3%, Range 0 – 42%

**Surface Covers:**
Large Rock: Mean 18.5%, Range 0.0 –50%
Small Rock: Mean 58.4%, Range 15 – 100%
Fines: Mean 12.6%, Range 1 – 69%
Litter: Mean 1.7%, Range 0 – 10%

**Conservation Status Rank: Global** G5; **State (California)** S5

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **1** | **1** | | **6** | | | | **9** |

**Surveys Used in Description (N = 17):** DEVA0312, DEVA0821, DEVA9311, DEVA9426, DEVA9544, DEVAS108, JAWB0115, MOJC0375, MOJC0691, MOJC0699, MOJC0762, SLTN0767, SLTN0863, SLTN1048, SLTN1154, SLTN1213, TEHA0011

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ambrosia dumosa* | 100 | 57.9 | 9.5 | 3.0 | 26.0 | **x** | **x** | | **x** |
| | *Larrea tridentata* | 79 | 4.7 | 0.8 | 0.0 | 6.0 | **x** | | | **x** |
| | *Atriplex confertifolia* | 47 | 2.9 | 0.5 | 0.1 | 2.0 | | | | |
| | *Xylorhiza tortifolia* | 47 | 2.0 | 0.3 | 0.1 | 1.0 | | | | |
| | *Echinocactus polycephalus* | 42 | 1.2 | 0.2 | 0.1 | 1.0 | | | | |
| | *Psorothamnus arborescens* | 37 | 2.5 | 0.4 | 0.1 | 4.0 | | | | |
| | *Hymenoclea salsola* | 37 | 1.3 | 0.2 | 0.1 | 2.0 | | | | |
| | *Atriplex hymenelytra* | 32 | 3.5 | 0.5 | 0.2 | 3.0 | | | | |
| | *Lycium andersonii* | 26 | 2.1 | 0.3 | 0.2 | 2.0 | | | | |
| | *Grayia spinosa* | 26 | 1.5 | 0.3 | 0.1 | 2.0 | | | | |
| | *Stephanomeria pauciflora* | 26 | 0.5 | 0.1 | 0.1 | 0.5 | | | | |
| | *Ephedra nevadensis* | 21 | 1.5 | 0.2 | 0.2 | 2.0 | | | | |
| | *Opuntia basilaris* | 21 | 0.4 | 0.1 | 0.1 | 0.5 | | | | |
| **Herb** | | | | | | | | | | |
| | *Eriogonum inflatum* | 58 | 4.6 | 0.2 | 0.1 | 1.0 | | | | **x** |
| | *Bromus rubens* | 47 | 15.0 | 1.9 | 0.1 | 20.0 | | | | |
| | *Achnatherum speciosum* | 37 | 6.2 | 0.2 | 0.1 | 1.0 | | | | |
| | *Schismus* | 37 | 2.2 | 0.1 | 0.1 | 1.0 | | | | |
| | *Amsinckia* | 32 | 4.6 | 0.3 | 0.1 | 5.0 | | | | |
| | *Cryptantha* | 32 | 2.0 | 0.1 | 0.1 | 0.5 | | | | |
| | *Eriogonum* | 32 | 2.8 | 0.1 | 0.1 | 0.5 | | | | |
| | *Erodium cicutarium* | 26 | 1.6 | 0.1 | 0.2 | 1.0 | | | | |
| | *Malacothrix glabrata* | 26 | 1.2 | 0.1 | 0.1 | 1.0 | | | | |
| | *Phacelia* | 26 | 1.2 | 0.1 | 0.1 | 0.5 | | | | |
| | *Chorizanthe rigida* | 26 | 1.2 | 0.0 | 0.1 | 0.2 | | | | |
| | *Plantago ovata* | 21 | 11.1 | 0.5 | 0.2 | 5.0 | | | | |
| | *Chorizanthe brevicornu* | 21 | 1.0 | 0.0 | 0.2 | 0.2 | | | | |
| | *Mentzelia* | 21 | 0.8 | 0.0 | 0.2 | 0.2 | | | | |
| | *Lepidium lasiocarpum* | 21 | 1.0 | 0.0 | 0.1 | 0.2 | | | | |
| | *Oxytheca perfoliata* | 21 | 0.7 | 0.0 | 0.1 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | *Cryptogammic crust* | 32 | 28.9 | 0.3 | 0.2 | 5.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = 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 salsola* | 37 | CEGL005398 |
| *Ambrosia salsola – Larrea tridentata* | 13 | CEGL005753 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 957 m, Range 138 – 1871 m
Slope: Mean 7°, Range 0 – 33°
Aspect: Variable

Tree Cover: Mean 0.1%, Range 0 – 1%
Shrub Cover: Mean 15.9%, Range 1 – 60%
Herb Cover: Mean 6.0%, Range 0 – 66%

**Surface Covers:**
Large Rock: Mean 7.3%, Range 0.0 –60%
Small Rock: Mean 71.3%, Range 0 – 100%
Fines: Mean 13.7%, Range 0 – 92%
Litter: Mean 2.0%, Range 0 – 10%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | **4** | | **28** | | | | **18** |

**Surveys Used in Description (N = 50):** DEVA0319, DEVA0333, DEVA9214, DEVA9222, DEVA9286, DEVA9337, DEVA9362, DEVA9365, DEVA9375, DEVA9408, DEVA9432, DEVA9505, DEVA9525, DEVA9535, DEVA9652, DEVA9807, DEVA9917, DEVAD003, DEVAD007, DEVAD015, DEVAD016, DEVAD020, DEVAD034, DEVAD036, DEVAD040, DEVAD075, DEVAD159, DEVAD212, DEVAS190, DEVAS194, MOJC0455, MOJC0536, MOJC0827, MOJC0910, MOJC0962, MOJC0966, MOJC1052, SLTN0244, SLTN0535, SLTN0643, SLTN0740, SLTN0753, SLTN0944, SLTN1045, SLTN1046, SLTN1049, SLTN1099, SLTN1205, SLTN1217, SLTN1218, TEHA0004, TEHA0005

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Hymenoclea salsola* | 100 | 52.2 | 8.1 | 1.0 | 28.0 | **x** | **x** | | **x** |
| | *Ambrosia dumosa* | 65 | 8.8 | 1.5 | 0.1 | 15.0 | | | | **x** |
| | *Larrea tridentata* | 65 | 8.1 | 1.5 | 0.1 | 15.0 | | | | **x** |
| | *Stephanomeria pauciflora* | 42 | 1.0 | 0.1 | 0.1 | 1.0 | | | | |
| | *Atriplex hymenelytra* | 31 | 2.1 | 0.3 | 0.1 | 5.0 | | | | |
| | *Opuntia basilaris* | 31 | 0.5 | 0.1 | 0.1 | 0.5 | | | | |
| | *Psorothamnus arborescens* | 27 | 2.5 | 0.7 | 0.1 | 15.0 | | | | |
| | *Lycium andersonii* | 23 | 1.3 | 0.2 | 0.1 | 2.0 | | | | |
| | *Encelia farinosa* | 21 | 1.9 | 0.3 | 0.1 | 8.0 | | | | |
| | *Bebbia juncea* | 21 | 1.5 | 0.3 | 0.1 | 10.0 | | | | |
| | *Grayia spinosa* | 21 | 1.4 | 0.2 | 0.1 | 4.0 | | | | |
| | *Eriogonum fasciculatum* | 21 | 1.2 | 0.2 | 0.1 | 5.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Eriogonum inflatum* | 52 | 6.4 | 0.1 | 0.1 | 0.5 | | | | **x** |
| | *Bromus rubens* | 48 | 10.0 | 0.5 | 0.1 | 7.0 | | | | |
| | *Cryptantha* | 40 | 3.7 | 0.1 | 0.1 | 1.0 | | | | |
| | *Chaenactis* | 31 | 4.6 | 0.3 | 0.1 | 8.2 | | | | |
| | *Amsinckia* | 31 | 3.4 | 0.3 | 0.1 | 5.0 | | | | |
| | *Mentzelia* | 31 | 1.8 | 0.1 | 0.1 | 1.0 | | | | |
| | *Gilia* | 21 | 1.1 | 0.1 | 0.1 | 1.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Ambrosia salsola* Association

**Common Name:** Cheesebush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 922 m, Range 138 – 1871 m
Slope: Mean 7°, Range 1 – 33°
Aspect: Mostly south-facing

Tree Cover: Mean 0.1%, Range 0 – 1%
Shrub Cover: Mean 14.1%, Range 1 – 45%
Herb Cover: Mean 5.1%, Range 0 – 40%

**Surface Covers:**
Large Rock: Mean 7.8%, Range 0.0 –60%
Small Rock: Mean 70.1%, Range 0 – 95%
Fines: Mean 14.3%, Range 0 – 92%
Litter: Mean 1.7%, Range 0 – 8%

**Surveys Used in Description (N = 37):** DEVA0333, DEVA9214, DEVA9222, DEVA9286, DEVA9365, DEVA9375, DEVA9432, DEVA9505, DEVA9525, DEVA9535, DEVA9652, DEVA9807, DEVA9917, DEVAD003, DEVAD015, DEVAD016, DEVAD020, DEVAD034, DEVAD036, DEVAD040, DEVAD075, DEVAS190, MOJC0455, MOJC0536, MOJC0910, MOJC0962, MOJC0966, SLTN0244, SLTN0535, SLTN0643, SLTN0753, SLTN0944, SLTN1049, SLTN1205, SLTN1217, SLTN1218, TEHA0004

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Hymenoclea salsola* | 100 | 58.5 | 8.6 | 1.0 | 28.0 | X | X | | X |
| | *Ambrosia dumosa* | 58 | 9.0 | 1.4 | 0.1 | 15.0 | | | | X |
| | *Larrea tridentata* | 53 | 3.1 | 0.4 | 0.1 | 3.0 | | | | X |
| | *Stephanomeria pauciflora* | 42 | 0.9 | 0.1 | 0.1 | 1.0 | | | | |
| | *Atriplex hymenelytra* | 37 | 2.7 | 0.4 | 0.1 | 5.0 | | | | |
| | *Opuntia basilaris* | 29 | 0.5 | 0.1 | 0.1 | 0.5 | | | | |
| | *Bebbia juncea* | 24 | 1.9 | 0.4 | 0.1 | 10.0 | | | | |
| | *Encelia farinosa* | 24 | 1.7 | 0.2 | 0.1 | 4.0 | | | | |
| | *Peucephyllum schottii* | 24 | 1.3 | 0.1 | 0.1 | 2.0 | | | | |
| | *Eriogonum fasciculatum* | 21 | 1.0 | 0.2 | 0.1 | 5.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Eriogonum inflatum* | 53 | 7.3 | 0.1 | 0.1 | 0.5 | | | | X |
| | *Bromus rubens* | 47 | 9.9 | 0.3 | 0.1 | 3.0 | | | | |
| | *Cryptantha* | 37 | 2.9 | 0.1 | 0.1 | 1.0 | | | | |
| | *Mentzelia* | 29 | 1.6 | 0.1 | 0.1 | 0.5 | | | | |
| | *Chaenactis* | 26 | 3.6 | 0.3 | 0.1 | 8.2 | | | | |
| | *Amsinckia* | 26 | 2.9 | 0.2 | 0.1 | 5.0 | | | | |
| | *Camissonia* | 21 | 2.0 | 0.1 | 0.1 | 1.0 | | | | |

## *Ambrosia salsola – Larrea tridentata* Association

**Common Name:** Cheesebush – Creosote Bush Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1051 m, Range 502 – 1495 m
Slope: Mean 7°, Range 0 – 33°
Aspect: Variable

Tree Cover: Mean 0.2%, Range 0 – 1%
Shrub Cover: Mean 20.7%, Range 5 – 60%
Herb Cover: Mean 8.3%, Range 0 – 66%

**Surface Covers:**
Large Rock: Mean 6.1%, Range 0.0 –20%
Small Rock: Mean 74.2%, Range 45 – 100%
Fines: Mean 12.3%, Range 1 – 45%
Litter: Mean 2.6%, Range 0 – 10%

**Surveys Used in Description (N = 13):** DEVA0319, DEVA9337, DEVA9362, DEVAD159, DEVAD212, DEVAS194, MOJC0827, MOJC1052, SLTN0740, SLTN1045, SLTN1046, SLTN1099, TEHA0005

**Association Stand Table:**

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | |
| *Hymenoclea salsola* | 100 | 35.0 | 6.8 | 2.0 | 15.0 | X | | X | X |
| *Larrea tridentata* | 100 | 21.8 | 4.4 | 1.0 | 15.0 | X | | | X |
| *Ambrosia dumosa* | 86 | 8.2 | 1.7 | 0.1 | 10.0 | X | | | X |
| *Psorothamnus arborescens* | 50 | 5.5 | 1.7 | 0.2 | 15.0 | | | | X |
| *Grayia spinosa* | 43 | 2.1 | 0.3 | 0.1 | 2.0 | | | | |
| *Stephanomeria pauciflora* | 43 | 1.2 | 0.2 | 0.1 | 1.0 | | | | |
| *Lycium andersonii* | 36 | 3.2 | 0.5 | 0.2 | 2.0 | | | | |
| *Opuntia basilaris* | 36 | 0.6 | 0.1 | 0.1 | 0.5 | | | | |
| *Encelia actonii* | 29 | 2.5 | 0.5 | 0.1 | 6.0 | | | | |
| *Atriplex confertifolia* | 29 | 1.8 | 0.3 | 0.1 | 2.0 | | | | |
| *Acamptopappus shockleyi* | 21 | 1.1 | 0.4 | 1.0 | 3.0 | | | | |
| *Eriogonum fasciculatum* | 21 | 1.7 | 0.2 | 1.0 | 1.0 | | | | |
| *Xylorhiza tortifolia* | 21 | 0.4 | 0.1 | 0.1 | 1.0 | | | | |
| *Ephedra funerea* | 21 | 0.5 | 0.1 | 0.1 | 1.0 | | | | |
| **Herb** | | | | | | | | | |
| *Bromus rubens* | 50 | 10.0 | 0.7 | 0.1 | 7.0 | | | | X |
| *Eriogonum inflatum* | 50 | 4.0 | 0.1 | 0.1 | 0.5 | | | | X |
| *Cryptantha* | 50 | 6.0 | 0.1 | 0.1 | 1.0 | | | | X |
| *Amsinckia* | 43 | 4.6 | 0.4 | 0.1 | 4.0 | | | | |
| *Chaenactis* | 43 | 7.1 | 0.2 | 0.1 | 1.0 | | | | |
| *Mentzelia* | 36 | 2.4 | 0.1 | 0.1 | 1.0 | | | | |
| *Gilia* | 36 | 1.0 | 0.0 | 0.1 | 0.2 | | | | |
| *Eriogonum* | 29 | 9.1 | 0.2 | 0.1 | 3.0 | | | | |
| *Schismus* | 29 | 9.8 | 0.1 | 0.1 | 0.5 | | | | |
| *Chorizanthe brevicornu* | 29 | 1.9 | 0.1 | 0.2 | 0.5 | | | | |
| *Mirabilis laevis* | 29 | 1.0 | 0.1 | 0.1 | 0.5 | | | | |
| *Sphaeralcea ambigua* | 29 | 1.0 | 0.1 | 0.1 | 0.5 | | | | |
| **Non-vasc** | | | | | | | | | |
| Cryptogammic crust | 29 | 26.2 | 0.1 | 0.2 | 1.0 | | | | |

## *Arctostaphylos viscida* Shrubland Alliance

**Common Name:** Whiteleaf manzanita chaparral

**NVC Alliance Code:** A3865. *Arctostaphylos viscida - Arctostaphylos myrtifolia - Arctostaphylos manzanita* Chaparral Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Arctostaphylos viscida* | 1 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: 1306 m
Slope: 16°
Aspect: Northwest-facing

Tree Cover: 3.2%
Shrub Cover: 20.0%
Herb Cover: 0.2%

**Surface Covers:**
Large Rock: 0.0%
Small Rock: 50.0%
Fines: 43.0%
Litter: 5.0%

**Conservation Status Rank: Global** G4; **State (California)** S4

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **1** | | | | | | | |

**Surveys Used in Description (N = 1):** JAWB0035

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Quercus wislizeni* | 100 | 46.9 | 3.0 | 3.0 | 3.0 | x | | x | x |
| | *Pinus sabiniana* | 100 | 46.9 | 3.0 | 3.0 | 3.0 | x | | x | x |
| | *Pinus monophylla* | 100 | 6.3 | 0.4 | 0.4 | 0.4 | x | | | x |
| **Shrub** | | | | | | | | | | |
| | *Arctostaphylos viscida* | 100 | 76.5 | 13.0 | 13.0 | 13.0 | x | x | | x |
| | *Cercocarpus montanus* var. *glaber* | 100 | 11.8 | 2.0 | 2.0 | 2.0 | x | | | x |
| | *Quercus john-tuckeri* | 100 | 11.8 | 2.0 | 2.0 | 2.0 | x | | | x |
| **Herb** | | | | | | | | | | |
| | *Descurainia sophia* | 100 | 33.3 | 0.2 | 0.2 | 0.2 | x | | x | x |
| | *Poa secunda* | 100 | 33.3 | 0.2 | 0.2 | 0.2 | x | | x | x |
| | *Galium aparine* | 100 | 33.3 | 0.2 | 0.2 | 0.2 | x | | x | x |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Non-vasc** | | | | | | | | | | |
| | *Cryptogammic crust* | 100 | 92.6 | 5.0 | 5.0 | 5.0 | **x** | **x** | | **x** |
| | Lichen | 100 | 7.4 | 0.4 | 0.4 | 0.4 | **x** | | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Artemisia tridentata* Shrubland Alliance

**Common Name:** Big sagebrush scrub

**NVC Alliance Code:** A3198. *Artemisia tridentata* - Mixed Shrub Dry Steppe & Shrubland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Artemisia tridentata* | 11 | CEGL000991 |
| *Artemisia tridentata – (Ericameria nauseosa) / Bromus tectorum* | 5 | CEGL002699 |
| *Artemisia tridentata – Ericameria nauseosa* | 21 | CEGL000998 |
| *Artemisia tridentata* (alliance) | 9 | A3198 |

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1848 m, Range 1175 – 3125 m
Slope: Mean 16°, Range 0 – 58°
Aspect: Northeast or southeast-facing

Tree Cover: Mean 0.4%, Range 0 – 4%
Shrub Cover: Mean 26.0%, Range 2 – 60%
Herb Cover: Mean 8.3%, Range 0 – 40%

**Surface Covers:**
Large Rock: Mean 22.6%, Range 0.0 –90%
Small Rock: Mean 35.1%, Range 6 – 92%
Fines: Mean 23.7%, Range 0 – 76%
Litter: Mean 4.0%, Range 0 – 30%

**Conservation Status Rank: Global** G5; **State (California)** S5

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | **2** | **11** | **5** | | **2** | **9** | | **16** |

**Surveys Used in Description (N = 46):** ABD012_a, BIS019_d, BLK002_a, BLK002_d, BLK029_d, D06021058, DEVA9150, DEVA9234, DEVA9330, DEVAD144, DEVAD145, DEVAD151, DEVAD152, DEVAS040, DEVAS071, DEVAS076, FIR1211061514, FIR1211071349, IND029_a, JAWB0026, JAWB0206, JAWB0216, MOJC0063, MOJC0452, POA1504011205, SLTN0368, SLTN0401, SLTN0434, SLTN0485, SLTN0516, SLTN0519, SLTN0609, SLTN0672, SLTN0718, SLTN0751, SLTN0787, SLTN0809, SLTN0850, SLTN1009, SLTN1052, SLTN1181, SLTN1197, SLTN1198, TEHA0021, TEHA0024, TEHA0028

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Artemisia tridentata* | 93 | 54.9 | 15.8 | 0.7 | 56.0 | x | x | | x |
| | *Ericameria nauseosa* | 59 | 13.3 | 3.5 | 0.2 | 25.0 | | | | x |
| | *Ephedra nevadensis* | 23 | 1.6 | 0.2 | 0.1 | 6.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Elymus elymoides* | 43 | 2.7 | 0.2 | 0.1 | 2.0 | | | | |
| | *Achnatherum hymenoides* | 34 | 2.7 | 0.1 | 0.1 | 3.0 | | | | |
| | *Bromus tectorum* | 25 | 12.8 | 2.4 | 0.1 | 39.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Artemisia tridentata* Association

**Common Name:** Big Sagebrush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1929 m, Range 1337 – 3038 m
Slope: Mean 15°, Range 2 – 29°
Aspect: Mostly north-facing

Tree Cover: Mean 0.5%, Range 0 – 2%
Shrub Cover: Mean 31.6%, Range 17 – 60%
Herb Cover: Mean 5.4%, Range 1 – 15%

**Surface Covers:**
Large Rock: Mean 21.4%, Range 0.0 –70%
Small Rock: Mean 31.5%, Range 6 – 92%
Fines: Mean 28.7%, Range 0 – 76%
Litter: Mean 6.4%, Range 0 – 26%

**Surveys Used in Description (N = 11):** DEVA9150, DEVAS071, DEVAS076, FIR1211061514, JAWB0026, JAWB0216, MOJC0063, MOJC0452, SLTN0609, SLTN0751, SLTN1181

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Quercus wislizeni* | 20 | 4.2 | 0.1 | 0.2 | 1.0 | | | | |
| | *Yucca brevifolia* | 20 | 20.0 | 0.1 | 0.2 | 0.7 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Artemisia tridentata* | 100 | 83.2 | 26.9 | 10.0 | 56.0 | X | X | | X |
| | *Ephedra viridis* | 20 | 1.8 | 0.6 | 2.0 | 4.0 | | | | |
| | *Ceanothus cuneatus* | 20 | 1.5 | 0.6 | 1.0 | 5.0 | | | | |
| | *Ericameria nauseosa* | 20 | 0.5 | 0.2 | 0.2 | 2.0 | | | | |
| | *Pleiacanthus spinosus* | 20 | 0.4 | 0.2 | 0.5 | 1.0 | | | | |
| | *Atriplex confertifolia* | 20 | 0.4 | 0.1 | 0.2 | 0.5 | | | | |
| | *Ephedra nevadensis* | 20 | 0.4 | 0.1 | 0.2 | 0.5 | | | | |
| | *Grayia spinosa* | 20 | 0.1 | 0.0 | 0.1 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Achnatherum hymenoides* | 50 | 4.3 | 0.1 | 0.1 | 0.5 | | | | X |
| | *Elymus elymoides* | 40 | 4.2 | 0.1 | 0.1 | 0.5 | | | | |
| | Graminoid (grass or grasslike) | 20 | 16.5 | 1.0 | 1.5 | 8.0 | | | | |
| | *Bromus tectorum* | 20 | 9.6 | 0.6 | 0.1 | 6.0 | | | | |
| | *Eriogonum* | 20 | 8.5 | 0.2 | 0.1 | 2.0 | | | | |
| | *Erigeron aphanactis* | 20 | 0.8 | 0.0 | 0.1 | 0.2 | | | | |

## *Artemisia tridentata – (Ericameria nauseosa) / Bromus tectorum* Association

**Common Name:** Big Sagebrush – (Rabbitbrush) / Cheatgrass Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1622 m, Range 1287 – 2176 m
Slope: Mean 17°, Range 3 – 24°
Aspect: East-facing

Tree Cover: Mean 0.4%, Range 0 – 2%
Shrub Cover: Mean 21.6%, Range 3 – 40%
Herb Cover: Mean 23.8%, Range 3 – 40%

**Surface Covers:**
Large Rock: Mean 21.0%, Range 10.0 –30%
Small Rock: Mean 45.0%, Range 35 – 50%
Fines: Mean 10.3%, Range 5 – 20%
Litter: 0%

**Surveys Used in Description (N = 5):** D06021058, FIR1211071349, SLTN0368, SLTN0672, SLTN0718

**Association Stand Table:**

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Yucca brevifolia* | 20 | 20.0 | 0.4 | 2.0 | 2.0 | | | | |
| **Shrub** | | | | | | | | | |
| *Artemisia tridentata* | 100 | 52.4 | 12.2 | 2.0 | 20.0 | X | X | | X |
| *Ephedra nevadensis* | 60 | 8.6 | 1.4 | 0.2 | 6.0 | | | | X |
| *Eriogonum fasciculatum* | 40 | 9.0 | 2.6 | 5.0 | 8.0 | | | | |
| *Ericameria cooperi* | 40 | 13.3 | 2.2 | 2.0 | 9.0 | | | | |
| *Grayia spinosa* | 40 | 2.9 | 0.6 | 1.0 | 2.0 | | | | |
| *Eriogonum umbellatum* | 40 | 0.3 | 0.1 | 0.1 | 0.2 | | | | |
| *Stephanomeria pauciflora* | 40 | 0.2 | 0.0 | 0.1 | 0.1 | | | | |
| *Ericameria linearifolia* | 20 | 4.6 | 1.4 | 7.0 | 7.0 | | | | |
| *Ceanothus greggii* var. *vestitus* | 20 | 3.0 | 0.6 | 3.0 | 3.0 | | | | |
| *Ericameria nauseosa* | 20 | 2.0 | 0.6 | 3.0 | 3.0 | | | | |
| *Chrysothamnus viscidiflorus* | 20 | 1.2 | 0.2 | 1.0 | 1.0 | | | | |
| *Atriplex confertifolia* | 20 | 0.9 | 0.0 | 0.2 | 0.2 | | | | |
| *Cylindropuntia echinocarpa* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| *Tetradymia axillaris* | 20 | 0.9 | 0.0 | 0.2 | 0.2 | | | | |
| *Krascheninnikovia lanata* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Psorothamnus arborescens* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Opuntia polyacantha* var. *erinacea* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Ericameria teretifolia* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Eriogonum wrightii* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Erigeron concinnus* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Atriplex canescens* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 100 | 75.7 | 18.6 | 1.0 | 39.0 | X | X | | X |
| | *Amsinckia* | 40 | 3.8 | 1.0 | 0.1 | 5.0 | | | | |
| | *Elymus elymoides* | 40 | 3.1 | 0.8 | 2.0 | 2.0 | | | | |
| | *Achnatherum hymenoides* | 40 | 2.2 | 0.6 | 0.1 | 3.0 | | | | |
| | *Astragalus* | 40 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Achnatherum speciosum* | 40 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Bromus rubens* | 20 | 4.2 | 1.0 | 5.0 | 5.0 | | | | |
| | *Mentzelia albicaulis* | 20 | 2.9 | 0.8 | 4.0 | 4.0 | | | | |
| | *Lupinus magnificus* | 20 | 1.4 | 0.4 | 2.0 | 2.0 | | | | |
| | *Pleuraphis jamesii* | 20 | 1.0 | 0.4 | 2.0 | 2.0 | | | | |
| | *Vulpia* | 20 | 0.8 | 0.2 | 1.0 | 1.0 | | | | |
| | Forb (herbaceous, not grass nor grasslike) | 20 | 0.3 | 0.1 | 0.3 | 0.3 | | | | |
| | *Sisymbrium* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Bromus madritensis* | 20 | 3.3 | 0.0 | 0.2 | 0.2 | | | | |
| | *Astragalus newberryi* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Calochortus leichtlinii* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Phlox stansburyi* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Layia glandulosa* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Delphinium* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Cryptantha* | 20 | 0.0 | 0.0 | 0.1 | 0.1 | | | | |
| | *Penstemon patens* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Eriastrum* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Castilleja angustifolia* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Sphaeralcea ambigua* | 20 | 0.0 | 0.0 | 0.1 | 0.1 | | | | |
| | *Castilleja* | 20 | 0.0 | 0.0 | 0.1 | 0.1 | | | | |
| | *Chaenactis stevioides* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |

## *Artemisia tridentata – Ericameria nauseosa* Association

**Common Name:** Big Sagebrush – Rubber Rabbitbrush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1793 m, Range 1179 – 2870 m
Slope: Mean 19°, Range 3 – 58°
Aspect: Variable

Tree Cover: Mean 0.2%, Range 0 – 2%
Shrub Cover: Mean 26.8%, Range 2 – 60%
Herb Cover: Mean 5.3%, Range 0 – 21%

**Surface Covers:**
Large Rock: Mean 22.9%, Range 0.0 –90%
Small Rock: Mean 29.9%, Range 8 – 78%
Fines: Mean 26.7%, Range 0 – 74%
Litter: Mean 4.2%, Range 0 – 30%

**Surveys Used in Description (N = 21):** ABD012_a, BIS019_d, BLK002_a, BLK002_d, BLK029_d, DEVA9234, DEVAD144, JAWB0206, POA1504011205, SLTN0485, SLTN0516, SLTN0519, SLTN0787, SLTN0809, SLTN0850, SLTN1009, SLTN1052, SLTN1197, SLTN1198, TEHA0021, TEHA0028

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Artemisia tridentata* | 100 | 50.1 | 15.4 | 0.7 | 40.0 | X | X | | X |
| | *Ericameria nauseosa* | 100 | 26.6 | 6.9 | 0.5 | 25.0 | X | | | X |
| | *Atriplex canescens* | 29 | 4.3 | 0.4 | 0.2 | 2.4 | | | | |
| **Herb** | | | | | | | | | | |
| | *Elymus elymoides* | 48 | 2.1 | 0.1 | 0.1 | 0.2 | | | | |
| | *Achnatherum hymenoides* | 33 | 3.0 | 0.1 | 0.1 | 1.0 | | | | |
| | *Gayophytum diffusum* | 24 | 12.0 | 1.7 | 0.1 | 20.0 | | | | |

## *Atriplex canescens* Shrubland Alliance

**Common Name:** Fourwing saltbush scrub

**NVC Alliance Code:** A0869. *Atriplex canescens* Scrub Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Atriplex canescens* | 11 | CEGL001281 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1413 m, Range 38 – 1907 m
Slope: Mean 3°, Range 0 – 28°
Aspect: Variable

Tree Cover: 0.0%
Shrub Cover: Mean 14.5%, Range 7 – 28%
Herb Cover: Mean 10.0%, Range 0 – 32%

**Surface Covers:**
Large Rock: Mean 0.4%, Range 0.0 –4%
Small Rock: Mean 11.9%, Range 0 – 59%
Fines: Mean 64.9%, Range 8 – 98%
Litter: Mean 10.7%, Range 0 – 31%

**Conservation Status Rank: Global** G5; **State (California)** S4

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **1** | | | **1** | **1** | | | **8** |

**Surveys Used in Description (N = 11):** DEVA0228, DEVA9122, DEVA9153, DEVA9162, DEVA9331, DEVA9356, DEVAS014, FIR1211061645, JAWB0006, SLTN0734, SLTN1038

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Atriplex canescens* | 100 | 85.4 | 13.7 | 4.0 | 28.0 | **x** | **x** | | **x** |
| | *Krascheninnikovia lanata* | 45 | 0.7 | 0.1 | 0.1 | 0.2 | | | | |
| | *Atriplex confertifolia* | 27 | 1.2 | 0.1 | 0.2 | 1.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Salsola* | 55 | 13.9 | 0.6 | 0.1 | 3.0 | | | | **x** |
| | *Mentzelia albicaulis* | 55 | 5.0 | 0.3 | 0.2 | 2.0 | | | | **x** |
| | *Eriogonum deflexum* | 45 | 13.4 | 0.4 | 0.2 | 3.0 | | | | |
| | *Bromus rubens* | 36 | 6.8 | 0.3 | 0.2 | 3.0 | | | | |
| | *Bromus tectorum* | 27 | 7.4 | 1.6 | 0.2 | 14.0 | | | | |
| | *Phacelia fremontii* | 27 | 1.7 | 0.1 | 0.2 | 1.0 | | | | |
| | *Achnatherum hymenoides* | 27 | 0.7 | 0.0 | 0.1 | 0.2 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Atriplex confertifolia* Shrubland Alliance

**Common Name:** Shadscale scrub

**NVC Alliance Code:** A0870. *Atriplex confertifolia* Scrub Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Atriplex confertifolia* Great Basin | 9 | CEGL001294 |
| *Atriplex confertifolia – Krascheninnikovia lanata* | 11 | CEGL001301 |
| *Atriplex confertifolia – Picrothamnus desertorum* | 7 | CEGL001295 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1557 m, Range 881 – 2188 m
Slope: Mean 13°, Range 0 – 33°
Aspect: Variable

Tree Cover: Mean 0.2%, Range 0 – 2%
Shrub Cover: Mean 12.4%, Range 1 – 43%
Herb Cover: Mean 5.3%, Range 0 – 18%

**Surface Covers:**
Large Rock: Mean 20.0%, Range 0.0 –80%
Small Rock: Mean 51.6%, Range 0 – 89%
Fines: Mean 18.7%, Range 0 – 96%
Litter: Mean 1.7%, Range 0 – 10%

**Conservation Status Rank: Global** G5; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | **1** | | **5** | **1** | | **20** |

**Surveys Used in Description (N = 27):** DEVA0104, DEVA0200, DEVA9225, DEVA9256, DEVA9355, DEVA9440, DEVA9509, DEVA9573, DEVAD169, DEVAS205, FIR1211061131, FIR1211061351, FISH0057, FISH0072, MOJC0175, MOJC0177, MOJC0450, MOJC0492, MOJC0608, MOJC0609, MOJC0649, MOJC0931, SLTN0423, SLTN0568, SLTN0619, SLTN0655, SLTN0932, SLTN0964, SLTN1093, SLTN1220

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Atriplex confertifolia* | 100 | 42.1 | 4.9 | 1.0 | 20.0 | **x** | | **x** | **x** |
| | *Krascheninnikovia lanata* | 64 | 11.8 | 1.6 | 0.1 | 7.0 | | | | **x** |
| | *Picrothamnus desertorum* | 54 | 8.9 | 1.9 | 0.2 | 14.0 | | | | **x** |
| | *Ephedra nevadensis* | 54 | 2.4 | 0.4 | 0.1 | 2.0 | | | | **x** |
| | *Lycium andersonii* | 46 | 3.1 | 0.5 | 0.1 | 3.0 | | | | |
| | *Xylorhiza tortifolia* | 43 | 0.7 | 0.1 | 0.1 | 0.5 | | | | |
| | *Tetradymia axillaris* | 36 | 1.7 | 0.2 | 0.1 | 1.5 | | | | |
| | *Menodora spinescens* | 29 | 2.0 | 0.5 | 0.2 | 5.0 | | | | |
| | *Hymenoclea salsola* | 25 | 1.2 | 0.3 | 0.1 | 3.0 | | | | |
| | *Opuntia basilaris* | 25 | 0.5 | 0.1 | 0.1 | 0.5 | | | | |
| | *Psorothamnus arborescens* | 21 | 2.1 | 0.3 | 0.1 | 3.0 | | | | |
| | *Grayia spinosa* | 21 | 1.2 | 0.2 | 0.5 | 2.0 | | | | |
| | *Coleogyne ramosissima* | 21 | 1.1 | 0.2 | 0.2 | 3.0 | | | | |
| | *Lepidium fremontii* | 21 | 0.6 | 0.1 | 0.1 | 3.0 | | | | |
| | *Eriogonum fasciculatum* | 21 | 0.9 | 0.1 | 0.2 | 1.0 | | | | |
| | *Stephanomeria pauciflora* | 21 | 0.5 | 0.1 | 0.1 | 0.5 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 46 | 8.5 | 0.5 | 0.1 | 8.0 | | | | |
| | *Achnatherum hymenoides* | 46 | 9.5 | 0.4 | 0.1 | 6.0 | | | | |
| | *Sphaeralcea ambigua* | 39 | 2.8 | 0.1 | 0.1 | 1.0 | | | | |
| | *Eriogonum inflatum* | 32 | 2.5 | 0.1 | 0.1 | 0.5 | | | | |
| | *Achnatherum speciosum* | 25 | 4.8 | 0.3 | 0.1 | 3.0 | | | | |
| | *Mirabilis laevis* | 25 | 1.5 | 0.1 | 0.1 | 0.5 | | | | |
| | *Oxytheca perfoliata* | 25 | 2.1 | 0.1 | 0.1 | 1.0 | | | | |
| | *Elymus elymoides* | 25 | 1.8 | 0.1 | 0.1 | 0.5 | | | | |
| | *Eriogonum* | 25 | 2.3 | 0.0 | 0.1 | 0.2 | | | | |
| | *Pleuraphis jamesii* | 21 | 4.5 | 0.4 | 0.2 | 6.0 | | | | |
| | *Cryptantha* | 21 | 2.2 | 0.1 | 0.1 | 1.0 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | *Cryptogammic crust* | 21 | 17.1 | 0.3 | 0.2 | 4.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Atriplex confertifolia – Krascheninnikovia lanata* Association

**Common Name:** Shadscale – Winter Fat Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1569 m, Range 1305 – 2095 m
Slope: Mean 11°, Range 2 – 27°
Aspect: Mostly south-facing, but variable.

Tree Cover: 0%
Shrub Cover: Mean 9.3%, Range 1 – 15%
Herb Cover: Mean 8.4%, Range 0 – 18%

**Surface Covers:**
Large Rock: Mean 15.3%, Range 0.0 –50%
Small Rock: Mean 56.8%, Range 35 – 89%
Fines: Mean 22.9%, Range 1 – 63%
Litter: Mean 2.7%, Range 0 – 10%

**Surveys Used in Description (N = 11):** DEVA0104, DEVA9225, DEVA9355, DEVAS205, FIR1211061131, FISH0057, MOJC0175, MOJC0608, MOJC0609, MOJC0649, SLTN0932

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | Dom | cDom | Often |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Krascheninnikovia lanata* | 100 | 27.7 | 3.3 | 1.0 | 7.0 | X | | | X |
| | *Atriplex confertifolia* | 100 | 25.8 | 2.9 | 1.0 | 5.0 | X | | | X |
| | *Lycium andersonii* | 73 | 5.5 | 0.7 | 0.1 | 3.0 | | | | X |
| | *Ephedra nevadensis* | 73 | 3.6 | 0.4 | 0.1 | 2.0 | | | | X |
| | *Picrothamnus desertorum* | 55 | 3.1 | 0.4 | 0.2 | 1.0 | | | | X |
| | *Tetradymia axillaris* | 55 | 2.5 | 0.3 | 0.1 | 1.5 | | | | X |
| | *Menodora spinescens* | 45 | 2.3 | 0.3 | 0.2 | 1.0 | | | | |
| | *Atriplex canescens* | 36 | 2.0 | 0.2 | 0.2 | 1.0 | | | | |
| | *Xylorhiza tortifolia* | 36 | 0.8 | 0.1 | 0.2 | 0.5 | | | | |
| | *Psorothamnus arborescens* | 27 | 4.3 | 0.5 | 0.5 | 3.0 | | | | |
| | *Grayia spinosa* | 27 | 1.8 | 0.2 | 0.5 | 1.5 | | | | |
| | *Hymenoclea salsola* | 27 | 1.2 | 0.2 | 0.2 | 1.0 | | | | |
| | *Coleogyne ramosissima* | 27 | 1.0 | 0.1 | 0.2 | 1.0 | | | | |
| | *Ambrosia dumosa* | 27 | 0.9 | 0.1 | 0.2 | 0.5 | | | | |
| | *Stephanomeria pauciflora* | 27 | 0.7 | 0.1 | 0.2 | 0.5 | | | | |
| | *Acamptopappus shockleyi* | 27 | 0.6 | 0.1 | 0.2 | 0.5 | | | | |
| **Herb** | | | | | | | | | | |
| | *Achnatherum hymenoides* | 73 | 15.7 | 1.0 | 0.2 | 6.0 | | | | X |
| | *Bromus rubens* | 64 | 9.0 | 0.9 | 0.1 | 8.0 | | | | X |
| | *Sphaeralcea ambigua* | 55 | 3.5 | 0.2 | 0.1 | 1.0 | | | | X |
| | *Pleuraphis jamesii* | 45 | 8.0 | 0.8 | 0.2 | 6.0 | | | | |
| | *Mirabilis laevis* | 45 | 2.9 | 0.2 | 0.2 | 0.5 | | | | |
| | *Eriogonum inflatum* | 45 | 3.6 | 0.1 | 0.1 | 0.5 | | | | |
| | *Oxytheca perfoliata* | 36 | 3.1 | 0.1 | 0.1 | 1.0 | | | | |
| | *Achnatherum speciosum* | 27 | 4.7 | 0.3 | 0.1 | 3.0 | | | | |
| | *Cryptantha* | 27 | 2.9 | 0.1 | 0.1 | 1.0 | | | | |
| | *Amsinckia* | 27 | 0.9 | 0.0 | 0.1 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Cryptogammic crust | 27 | 27.3 | 0.1 | 0.2 | 0.5 | | | | |

## *Atriplex confertifolia – Picrothamnus desertorum* Association

**Common Name:** Shadscale – Bud Sagebrush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1607 m, Range 1182 – 2024 m
Slope: Mean 13°, Range 1 – 25°
Aspect: Mostly east-facing

Tree Cover: Mean 0.4%, Range 0 – 2%
Shrub Cover: Mean 22.1%, Range 3 – 43%
Herb Cover: Mean 4.2%, Range 0 – 14%

**Surface Covers:**
Large Rock: Mean 20.2%, Range 0.1 –80%
Small Rock: Mean 58.0%, Range 9 – 83%
Fines: Mean 4.7%, Range 0 – 10%
Litter: Mean 0.7%, Range 0 – 3%

**Surveys Used in Description (N = 7):** DEVAD169, MOJC0450, MOJC0931, SLTN0423, SLTN0655, SLTN0964, SLTN1093

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Yucca brevifolia* | 25 | 25.0 | 0.3 | 0.1 | 2.0 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Atriplex confertifolia* | 100 | 27.0 | 6.9 | 1.0 | 14.0 | X | | | X |
| | *Picrothamnus desertorum* | 100 | 26.8 | 6.3 | 2.0 | 14.0 | X | | | X |
| | *Ephedra nevadensis* | 75 | 3.0 | 0.6 | 0.1 | 2.0 | X | | | X |
| | *Krascheninnikovia lanata* | 63 | 2.8 | 0.8 | 0.1 | 4.0 | | | | X |
| | *Xylorhiza tortifolia* | 63 | 0.7 | 0.1 | 0.1 | 0.5 | | | | X |
| | *Ericameria cooperi* | 50 | 6.1 | 1.3 | 1.0 | 5.0 | | | | X |
| | *Lycium andersonii* | 50 | 3.1 | 0.8 | 0.1 | 3.0 | | | | X |
| | *Lepidium fremontii* | 50 | 1.7 | 0.5 | 0.1 | 3.0 | | | | X |
| | *Opuntia basilaris* | 50 | 1.1 | 0.2 | 0.1 | 0.5 | | | | X |
| | *Menodora spinescens* | 38 | 3.8 | 1.3 | 0.5 | 5.0 | | | | |
| | *Hymenoclea salsola* | 38 | 2.2 | 0.7 | 0.5 | 3.0 | | | | |
| | *Grayia spinosa* | 38 | 1.8 | 0.4 | 0.5 | 2.0 | | | | |
| | *Eriogonum fasciculatum* | 38 | 0.9 | 0.2 | 0.2 | 1.0 | | | | |
| | *Coleogyne ramosissima* | 25 | 1.7 | 0.4 | 0.5 | 3.0 | | | | |
| | *Gutierrezia microcephala* | 25 | 1.0 | 0.2 | 0.1 | 1.5 | | | | |
| | *Lycium cooperi* | 25 | 1.2 | 0.2 | 0.5 | 1.0 | | | | |
| | *Psorothamnus arborescens* | 25 | 1.1 | 0.2 | 0.5 | 1.0 | | | | |
| | *Echinocereus engelmannii* | 25 | 0.5 | 0.1 | 0.2 | 0.5 | | | | |
| | *Stephanomeria pauciflora* | 25 | 0.4 | 0.1 | 0.1 | 0.5 | | | | |
| | *Tetradymia axillaris* | 25 | 0.2 | 0.0 | 0.1 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Eriogonum* | 50 | 5.5 | 0.1 | 0.1 | 0.2 | | | | X |
| | *Achnatherum speciosum* | 38 | 8.9 | 0.5 | 0.2 | 2.0 | | | | |
| | *Bromus rubens* | 38 | 8.4 | 0.4 | 0.5 | 1.5 | | | | |
| | *Erodium cicutarium* | 25 | 1.9 | 0.1 | 0.5 | 0.5 | | | | |
| | *Sphaeralcea ambigua* | 25 | 1.9 | 0.1 | 0.5 | 0.5 | | | | |
| | *Stanleya* | 25 | 1.9 | 0.1 | 0.5 | 0.5 | | | | |
| | *Oxytheca perfoliata* | 25 | 1.8 | 0.1 | 0.2 | 0.5 | | | | |
| | *Eriogonum inflatum* | 25 | 2.1 | 0.1 | 0.1 | 0.5 | | | | |
| | *Chorizanthe rigida* | 25 | 1.5 | 0.1 | 0.1 | 0.5 | | | | |
| | *Elymus elymoides* | 25 | 3.2 | 0.1 | 0.1 | 0.5 | | | | |
| | *Achnatherum hymenoides* | 25 | 3.1 | 0.0 | 0.1 | 0.2 | | | | |
| | *Phacelia* | 25 | 3.5 | 0.0 | 0.1 | 0.1 | | | | |
| | *Chaenactis* | 25 | 3.9 | 0.0 | 0.1 | 0.1 | | | | |
| | *Cryptantha* | 25 | 2.9 | 0.0 | 0.1 | 0.1 | | | | |

## *Atriplex confertifolia* Great Basin Association

**Common Name:** Shadscale Great Basin Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1498 m, Range 881 – 2188 m
Slope: Mean 16°, Range 0 – 33°
Aspect: Mostly south-facing

Tree Cover: 0%
Shrub Cover: Mean 7.7%, Range 3 – 21%
Herb Cover: Mean 2.6%, Range 1 – 4%

**Surface Covers:**
Large Rock: Mean 25.6%, Range 0.0 –60%
Small Rock: Mean 39.4%, Range 0 – 75%
Fines: Mean 25.8%, Range 3 – 96%
Litter: Mean 1.3%, Range 0 – 4%

**Surveys Used in Description (N = 9):** DEVA0200, DEVA9256, DEVA9440, DEVA9573, FIR1211061351, FISH0072, SLTN0568, SLTN0619, SLTN1220

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Atriplex confertifolia* | 100 | 75.6 | 5.7 | 2.0 | 20.0 | X | X | | X |
| | *Echinocactus polycephalus* | 33 | 1.1 | 0.1 | 0.1 | 0.5 | | | | |
| | *Xylorhiza tortifolia* | 33 | 0.7 | 0.0 | 0.1 | 0.2 | | | | |
| | *Ericameria nauseosa* | 33 | 0.7 | 0.0 | 0.1 | 0.2 | | | | |
| | *Tetradymia axillaris* | 22 | 1.9 | 0.1 | 0.2 | 1.0 | | | | |
| | *Eriogonum fasciculatum* | 22 | 1.7 | 0.1 | 0.2 | 0.5 | | | | |
| | *Scopulophila rixfordii* | 22 | 0.8 | 0.1 | 0.1 | 0.5 | | | | |
| | *Krascheninnikovia lanata* | 22 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Lepidium fremontii* | 22 | 0.4 | 0.0 | 0.1 | 0.2 | | | | |
| | *Dedeckera eurekensis* | 22 | 0.5 | 0.0 | 0.1 | 0.2 | | | | |
| | *Opuntia basilaris* | 22 | 0.5 | 0.0 | 0.1 | 0.1 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 33 | 5.5 | 0.1 | 0.1 | 1.0 | | | | |
| | *Bromus rubens* | 33 | 8.1 | 0.1 | 0.1 | 1.0 | | | | |
| | *Achnatherum hymenoides* | 33 | 7.7 | 0.1 | 0.2 | 0.5 | | | | |
| | *Salsola* | 33 | 3.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Elymus elymoides* | 33 | 2.1 | 0.1 | 0.1 | 0.2 | | | | |
| | *Sphaeralcea ambigua* | 33 | 2.7 | 0.0 | 0.1 | 0.2 | | | | |
| | *Eriogonum inflatum* | 22 | 1.7 | 0.0 | 0.1 | 0.2 | | | | |
| | *Gilia* | 22 | 1.8 | 0.0 | 0.1 | 0.2 | | | | |
| | *Dasyochloa pulchella* | 22 | 2.2 | 0.0 | 0.1 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Cryptogammic crust | 22 | 10.8 | 0.2 | 0.2 | 2.0 | | | | |
| | Lichen | 22 | 6.1 | 0.0 | 0.2 | 0.2 | | | | |

## *Atriplex lentiformis* Shrubland Alliance

**Common Name:** Quailbush scrub

**NVC Alliance Code:** A3173. *Atriplex lentiformis* Wet Shrubland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Atriplex torreyi / Distichlis spicata – Sporobolus airoides* | 20 | |
| *Atriplex torreyi* | 37 | CEPP005799 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1194 m, Range 1120 – 1267 m
Slope: no data
Aspect: no data

Tree Cover: Mean 0.7%, Range 0 – 2%
Shrub Cover: Mean 19.9%, Range 8 – 41%
Herb Cover: Mean 12.5%, Range 0 – 75%

**Surface Covers:**
Large Rock: 0.0%
Small Rock: 0.1%
Fines: 40.0%
Litter: 0.0%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | **1** | **32** | | | **24** | | |

**Surveys Used in Description (N = 57):** A1805241727, BGP086_a, BGP088_a, BGP154_a, BGP204_d, BIS055_a, BIS068_d, BLK011_a, BLK016_a, BLK024_a, BLK033_a, BLK044_a, BLK074_a, BLK075_a, BLK094_a, BLK142_a, FSL053_a, FSP020_a, IND026_a, IND067_a, IND106_a, IND111_a, IND124_a, IND132_a, IND133_a, IND139_a, IND139_d, IND231_a, LAW040_d, LAW082_a, LAW105_a, LAW112_a, LAW137_a, LAW137_c, LAW154_d, LAW187_d, LNP045_a, LNP050_a, MAN007_a, MAN014_a, MAN037_a, MAN038_d, PLC007_a, PLC028_a, PLC059_a, PLC064_d, PLC070_a, PLC113_d, PLC241_d, PLC251_d, SLTN1081, TIN030_a, TIN050_a, TIN064_a, UNW039_a, UNW073_d, UNW074_d

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Atriplex torreyi* | 98 | 60.3 | 11.9 | 3.2 | 31.3 | **x** | **x** | | **x** |
| | *Ericameria nauseosa* | 93 | 16.1 | 3.2 | 0.1 | 11.2 | **x** | | | **x** |
| | *Sarcobatus vermiculatus* | 72 | 6.1 | 1.1 | 0.1 | 5.6 | | | | **x** |
| | *Suaeda moquinii* | 46 | 2.6 | 0.5 | 0.1 | 6.5 | | | | |
| | *Artemisia tridentata* | 42 | 4.6 | 1.0 | 0.1 | 10.9 | | | | |
| | *Atriplex confertifolia* | 40 | 1.6 | 0.3 | 0.0 | 2.2 | | | | |
| | *Salix exigua* | 33 | 1.6 | 0.3 | 0.1 | 3.6 | | | | |
| | *Rosa woodsii* | 30 | 0.7 | 0.2 | 0.1 | 2.6 | | | | |
| | *Atriplex canescens* | 26 | 0.7 | 0.1 | 0.1 | 1.4 | | | | |
| **Herb** | | | | | | | | | | |
| | *Sporobolus airoides* | 81 | 30.7 | 4.5 | 0.1 | 60.0 | **x** | | **x** | **x** |
| | *Distichlis spicata* | 67 | 20.4 | 3.2 | 0.1 | 19.1 | | | | **x** |
| | *Glycyrrhiza lepidota* | 63 | 9.5 | 1.2 | 0.1 | 15.0 | | | | **x** |
| | *Salsola* | 60 | 20.0 | 1.0 | 0.0 | 9.1 | | | | **x** |
| | *Bassia hyssopifolia* | 33 | 1.9 | 0.4 | 0.1 | 13.4 | | | | |
| | *Leymus triticoides* | 33 | 1.0 | 0.2 | 0.1 | 4.5 | | | | |
| | *Juncus arcticus* | 33 | 1.1 | 0.2 | 0.1 | 3.0 | | | | |
| | *Cordylanthus* | 25 | 1.8 | 0.2 | 0.1 | 2.4 | | | | |
| | *Atriplex serenana* | 25 | 2.3 | 0.2 | 0.0 | 3.9 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Atriplex torreyi* Association

**Common Name:** Torrey's Saltbush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1193 m, Range 1120 – 1267 m
Slope: no data
Aspect: no data

Tree Cover: Mean 0.5%, Range 0 – 1%
Shrub Cover: Mean 19.7%, Range 8 – 41%
Herb Cover: Mean 6.0%, Range 0 – 17%

**Surface Covers:**
Large Rock: no data
Small Rock: no data
Fines: no data
Litter: no data

**Surveys Used in Description (N = 37):** BGP088_a, BGP154_a, BGP204_d, BIS068_d, BLK011_a, BLK024_a, BLK044_a, BLK142_a, FSP020_a, IND026_a, IND067_a, IND106_a, IND111_a, IND132_a, IND133_a, IND139_a, IND139_d, IND231_a, LAW040_d, LAW082_a, LAW112_a, LAW137_a, LAW137_c, LAW154_d, LNP045_a, LNP050_a, MAN007_a, MAN037_a, PLC007_a, PLC064_d, PLC070_a, PLC113_d, PLC241_d, PLC251_d, TIN064_a, UNW073_d, UNW074_d

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Atriplex torreyi* | 97 | 66.7 | 13.0 | 3.9 | 31.3 | X | X | | X |
| | *Ericameria nauseosa* | 92 | 11.6 | 2.3 | 0.1 | 9.5 | X | | | X |
| | *Sarcobatus vermiculatus* | 78 | 5.7 | 1.0 | 0.1 | 4.1 | X | | | X |
| | *Suaeda moquinii* | 46 | 2.3 | 0.5 | 0.1 | 6.5 | | | | |
| | *Atriplex confertifolia* | 41 | 1.8 | 0.3 | 0.1 | 2.2 | | | | |
| | *Artemisia tridentata* | 32 | 3.3 | 0.9 | 0.1 | 10.9 | | | | |
| | *Atriplex canescens* | 27 | 0.7 | 0.1 | 0.1 | 1.1 | | | | |
| | *Atriplex polycarpa* | 24 | 2.4 | 0.5 | 0.1 | 5.1 | | | | |
| | *Salix exigua* | 24 | 0.7 | 0.1 | 0.1 | 1.2 | | | | |
| | *Rosa woodsii* | 24 | 0.4 | 0.1 | 0.1 | 1.6 | | | | |
| **Herb** | | | | | | | | | | |
| | *Sporobolus airoides* | 70 | 29.8 | 2.2 | 0.1 | 11.7 | | | | X |
| | *Salsola* | 62 | 28.5 | 1.2 | 0.1 | 9.1 | | | | X |
| | *Distichlis spicata* | 54 | 10.6 | 0.6 | 0.1 | 4.1 | | | | X |
| | *Glycyrrhiza lepidota* | 51 | 11.5 | 0.9 | 0.1 | 6.9 | | | | X |
| | *Bassia hyssopifolia* | 24 | 1.3 | 0.1 | 0.1 | 2.3 | | | | |
| | *Atriplex serenana* | 22 | 3.1 | 0.2 | 0.0 | 2.4 | | | | |

## *Atriplex torreyi* / *Distichlis spicata – Sporobolus airoides* Provisional Association

**Common Name:** Torrey's Saltbush / Salt Grass – Alkali Sacaton Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1195 m, Range 1136 – 1263 m
Slope: no data
Aspect: no data

Tree Cover: Mean 0.8%, Range 0 – 2%
Shrub Cover: Mean 20.2%, Range 9 – 35%
Herb Cover: Mean 24.1%, Range 6 – 75%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0.1%,
Fines: 40%
Litter: 0%

**Surveys Used in Description (N = 20):** A1805241727, BGP086_a, BIS055_a, BLK016_a, BLK033_a, BLK074_a, BLK075_a, BLK094_a, FSL053_a, IND124_a, LAW105_a, LAW187_d, MAN014_a, MAN038_d, PLC028_a, PLC059_a, SLTN1081, TIN030_a, TIN050_a, UNW039_a

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Salix laevigata* | 20 | 15.2 | 0.1 | 0.0 | 1.1 | | | | |
| **Shrub** | | | | | | | | | |
| *Atriplex torreyi* | 100 | 48.3 | 9.9 | 3.2 | 30.0 | X | | X | X |
| *Ericameria nauseosa* | 95 | 24.5 | 5.0 | 1.5 | 11.2 | X | | | X |
| *Artemisia tridentata* | 60 | 7.0 | 1.4 | 0.1 | 7.2 | | | | X |
| *Sarcobatus vermiculatus* | 60 | 6.7 | 1.3 | 0.4 | 5.6 | | | | X |
| *Salix exigua* | 50 | 3.2 | 0.7 | 0.2 | 3.6 | | | | X |
| *Suaeda moquinii* | 45 | 3.0 | 0.6 | 0.1 | 4.5 | | | | |
| *Rosa woodsii* | 40 | 1.3 | 0.3 | 0.1 | 2.6 | | | | |
| *Atriplex confertifolia* | 40 | 1.4 | 0.2 | 0.0 | 1.4 | | | | |
| *Atriplex canescens* | 25 | 0.6 | 0.1 | 0.1 | 1.4 | | | | |
| *Forestiera pubescens* | 20 | 0.2 | 0.0 | 0.1 | 0.3 | | | | |
| *Machaeranthera carnosa* | 20 | 0.1 | 0.0 | 0.0 | 0.1 | | | | |

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | |
| *Sporobolus airoides* | 100 | 32.3 | 8.9 | 0.8 | 60.0 | X | | X | X |
| *Distichlis spicata* | 90 | 38.7 | 8.0 | 1.1 | 19.1 | X | | X | X |
| *Glycyrrhiza lepidota* | 85 | 5.8 | 1.8 | 0.2 | 15.0 | X | | | X |
| *Leymus triticoides* | 65 | 2.0 | 0.6 | 0.1 | 4.5 | | | | X |
| *Juncus arcticus* | 65 | 1.9 | 0.5 | 0.1 | 3.0 | | | | X |
| *Salsola* | 55 | 4.1 | 0.7 | 0.0 | 5.3 | | | | X |
| *Bassia hyssopifolia* | 50 | 2.9 | 1.0 | 0.1 | 13.4 | | | | X |
| *Cordylanthus maritimus ssp. canescens* | 45 | 1.1 | 0.3 | 0.0 | 2.9 | | | | |
| *Cordylanthus* | 40 | 2.1 | 0.3 | 0.1 | 1.6 | | | | |
| *Atriplex serenana* | 30 | 0.8 | 0.2 | 0.1 | 3.9 | | | | |
| *Atriplex truncata* | 30 | 0.6 | 0.2 | 0.0 | 1.8 | | | | |
| *Leymus cinereus* | 30 | 0.6 | 0.1 | 0.0 | 0.9 | | | | |
| *Atriplex phyllostegia* | 25 | 0.6 | 0.1 | 0.1 | 0.9 | | | | |
| *Heliotropium curassavicum* | 25 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Ambrosia acanthicarpa* | 20 | 0.5 | 0.1 | 0.1 | 0.7 | | | | |
| *Malvella leprosa* | 20 | 0.2 | 0.0 | 0.1 | 0.3 | | | | |

## *Atriplex polycarpa* Shrubland Alliance

**Common Name:** Allscale scrub

**NVC Alliance Code:** A3174. *Atriplex polycarpa* Scrub Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Atriplex polycarpa* | 23 | CEGL001318 |
| *Atriplex polycarpa* (alliance) | 2 | A3174 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 716 m, Range -65 – 1366 m
Slope: Mean 2°, Range 0 – 8°
Aspect: Variable

Tree Cover: Mean 0.1%, Range 0 – 1%
Shrub Cover: Mean 12.9%, Range 2 – 42%
Herb Cover: Mean 4.5%, Range 0 – 25%

**Surface Covers:**
Large Rock: Mean 2.0%, Range 0.0 –30%
Small Rock: Mean 48.7%, Range 0 – 94%
Fines: Mean 31.0%, Range 1 – 99%
Litter: Mean 1.8%, Range 0 – 22%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | | | **3** | **12** | | | | **9** |

**Surveys Used in Description (N = 25):** DEVA0515, DEVA0801, DEVA9290, DEVA9316, DEVA9317, DEVA9374, DEVA9446, DEVA9502, DEVA9546, DEVA9626, DEVA9962, DEVAD022, DEVAD023, JAWB0112, MOJC0038, MOJC0046, MOJC0055, SLTN0420, SLTN0553, SLTN0782, SLTN0861, SLTN0864, SLTN0865, SLTN0881, SLTN0959

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Atriplex polycarpa* | 100 | 76.5 | 10.6 | 1.0 | 40.0 | x | x | | x |
| | *Larrea tridentata* | 46 | 6.9 | 0.6 | 0.2 | 5.0 | | | | |
| | *Ambrosia dumosa* | 29 | 2.9 | 0.4 | 0.1 | 5.0 | | | | |
| | *Suaeda moquinii* | 25 | 4.2 | 0.3 | 0.1 | 5.0 | | | | |
| | *Hymenoclea salsola* | 25 | 1.8 | 0.2 | 0.1 | 4.0 | | | | |
| | *Atriplex canescens* | 25 | 0.8 | 0.1 | 0.1 | 1.0 | | | | |
| | *unknown Asteraceae* | 21 | 0.3 | 0.1 | 0.1 | 1.0 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Schismus* | 29 | 11.2 | 0.6 | 0.2 | 10.0 | | | | |
| | *Cryptantha* | 25 | 3.5 | 0.1 | 0.2 | 1.0 | | | | |
| | *Chorizanthe rigida* | 25 | 3.3 | 0.0 | 0.1 | 0.2 | | | | |
| | *Gilia* | 25 | 2.9 | 0.0 | 0.1 | 0.2 | | | | |
| | *Amsinckia* | 21 | 2.6 | 0.2 | 0.1 | 5.0 | | | | |
| | *Bromus rubens* | 21 | 3.3 | 0.2 | 0.1 | 3.0 | | | | |
| | Forb (herbaceous, not grass nor grasslike) | 21 | 7.6 | 0.1 | 0.1 | 1.0 | | | | |
| | *Eriogonum* | 21 | 2.4 | 0.1 | 0.1 | 1.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Atriplex polycarpa* Association

**Common Name:** Allscale Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 673 m, Range -65 – 1366 m
Slope: Mean 2°, Range 0 – 4°
Aspect: Variable

Tree Cover: Mean 0.1%, Range 0 – 1%
Shrub Cover: Mean 12.9%, Range 2 – 42%
Herb Cover: Mean 2.8%, Range 0 – 13%

**Surface Covers:**
Large Rock: Mean 2.1%, Range 0.0 –30%
Small Rock: Mean 50.0%, Range 0 – 94%
Fines: Mean 32.6%, Range 1 – 99%
Litter: Mean 2.0%, Range 0 – 22%

**Surveys Used in Description (N = 23):** DEVA0515, DEVA0801, DEVA9290, DEVA9316, DEVA9317, DEVA9374, DEVA9446, DEVA9502, DEVA9546, DEVA9626, DEVA9962, DEVAD022, DEVAD023, JAWB0112, MOJC0038, MOJC0046, MOJC0055, SLTN0420, SLTN0782, SLTN0861, SLTN0864, SLTN0865, SLTN0959

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Atriplex polycarpa* | 100 | 77.8 | 11.0 | 1.0 | 40.0 | X | X | | X |
| | *Larrea tridentata* | 50 | 7.5 | 0.7 | 0.2 | 5.0 | | | | X |
| | *Suaeda moquinii* | 27 | 4.6 | 0.4 | 0.1 | 5.0 | | | | |
| | *Ambrosia dumosa* | 27 | 1.6 | 0.2 | 0.1 | 3.0 | | | | |
| | *Atriplex canescens* | 27 | 0.9 | 0.1 | 0.1 | 1.0 | | | | |
| | *Hymenoclea salsola* | 23 | 2.0 | 0.3 | 0.1 | 4.0 | | | | |
| | unknown Asteraceae | 23 | 0.4 | 0.1 | 0.1 | 1.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Schismus* | 32 | 12.2 | 0.6 | 0.2 | 10.0 | | | | |
| | *Cryptantha* | 27 | 3.9 | 0.1 | 0.2 | 1.0 | | | | |
| | *Bromus rubens* | 23 | 3.6 | 0.2 | 0.1 | 3.0 | | | | |
| | Forb (herbaceous, not grass nor grasslike) | 23 | 8.3 | 0.1 | 0.1 | 1.0 | | | | |
| | *Eriogonum* | 23 | 2.6 | 0.1 | 0.1 | 1.0 | | | | |
| | *Chorizanthe rigida* | 23 | 3.6 | 0.0 | 0.1 | 0.2 | | | | |
| | *Gilia* | 23 | 3.2 | 0.0 | 0.1 | 0.2 | | | | |

## *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

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Baccharis sergiloides* | 6 | CEGL002953 |
| *Baccharis sergiloides – Prunus fasciculata – Rhus trilobata* | 1 | |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 902 m, Range 579 – 1122 m
Slope: Mean 7°, Range 2 – 12°
Aspect: Variable

Tree Cover: Mean 0.4%, Range 0 – 1%
Shrub Cover: Mean 49.6%, Range 21 – 91%
Herb Cover: Mean 18.3%, Range 6 – 65%

**Surface Covers:**
Large Rock: Mean 5.0%, Range 0.2 –28%
Small Rock: Mean 23.8%, Range 5 – 48%
Fines: Mean 36.3%, Range 2 – 62%
Litter: Mean 32.9%, Range 2 – 73%

**Conservation Status Rank: Global** G4; **State (California)** S3

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **2** | | | **4** | | | | **1** |

**Surveys Used in Description (N = 7):** DEVA9189, DEVA9614, DEVA9630, DEVA9920, DEVA9925, JAWB0107, JAWB0113

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Baccharis sergiloides* | 100 | 73.6 | 37.4 | 15.0 | 75.0 | **x** | **x** | | **x** |
| | *Hymenoclea salsola* | 57 | 0.3 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Atriplex polycarpa* | 43 | 6.9 | 6.0 | 1.0 | 34.0 | | | | |
| | *Prunus fasciculata* | 29 | 3.9 | 1.7 | 0.2 | 12.0 | | | | |
| | *Bebbia juncea* | 29 | 0.7 | 0.2 | 0.2 | 1.0 | | | | |
| | *Tamarix ramosissima* | 29 | 0.7 | 0.2 | 0.2 | 1.0 | | | | |
| | *Brickellia longifolia* | 29 | 0.3 | 0.2 | 0.2 | 1.0 | | | | |
| | *Stephanomeria pauciflora* | 29 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum fasciculatum* | 29 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Larrea tridentata* | 29 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 57 | 18.0 | 1.8 | 0.2 | 10.0 | | | | **x** |
| | *Phragmites australis* | 29 | 16.3 | 9.7 | 3.0 | 65.0 | | | | |
| | *Distichlis spicata* | 29 | 7.8 | 1.1 | 3.0 | 5.0 | | | | |
| | *Typha* | 29 | 12.0 | 1.0 | 0.2 | 7.0 | | | | |
| | *Sporobolus airoides* | 29 | 4.9 | 0.7 | 2.0 | 3.0 | | | | |
| | *Juncus cooperi* | 29 | 3.6 | 0.6 | 1.0 | 3.0 | | | | |
| | *Senecio flaccidus* | 29 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Descurainia pinnata* | 29 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum inflatum* | 29 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Amsinckia* | 29 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 29 | 21.4 | 0.3 | 0.2 | 2.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Baccharis sergiloides* Association

**Common Name:** Broom Baccharis Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 886 m, Range 579 – 1122 m
Slope: Mean 6°, Range 2 – 12°
Aspect: Mostly southwest-facing

Tree Cover: Mean 0.4%, Range 0 – 1%
Shrub Cover: Mean 50.3%, Range 21 – 91%
Herb Cover: Mean 19.7%, Range 6 – 65%

**Surface Covers:**
Large Rock: Mean 5.1%, Range 0.2 –28%
Small Rock: Mean 21.3%, Range 5 – 48%
Fines: Mean 35.7%, Range 2 – 62%
Litter: Mean 35.9%, Range 2 – 73%

**Surveys Used in Description (N = 6):** DEVA9189, DEVA9614, DEVA9630, DEVA9920, DEVA9925, JAWB0113

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Baccharis sergiloides* | 100 | 75.0 | 38.7 | 15.0 | 75.0 | X | X | | X |
| | *Atriplex polycarpa* | 50 | 8.0 | 7.0 | 1.0 | 34.0 | | | | X |
| | *Hymenoclea salsola* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Bebbia juncea* | 33 | 0.8 | 0.2 | 0.2 | 1.0 | | | | |
| | *Brickellia longifolia* | 33 | 0.3 | 0.2 | 0.2 | 1.0 | | | | |
| | *Tamarix ramosissima* | 33 | 0.8 | 0.2 | 0.2 | 1.0 | | | | |
| | *Stephanomeria pauciflora* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Larrea tridentata* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 50 | 5.0 | 0.4 | 0.2 | 2.0 | | | | X |
| | *Phragmites australis* | 33 | 19.0 | 11.3 | 3.0 | 65.0 | | | | |
| | *Distichlis spicata* | 33 | 9.1 | 1.3 | 3.0 | 5.0 | | | | |
| | *Typha* | 33 | 14.0 | 1.2 | 0.2 | 7.0 | | | | |
| | *Sporobolus airoides* | 33 | 5.8 | 0.8 | 2.0 | 3.0 | | | | |
| | *Juncus cooperi* | 33 | 4.2 | 0.7 | 1.0 | 3.0 | | | | |
| | *Amsinckia* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum inflatum* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Senecio flaccidus* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |

## *Baccharis sergiloides – Prunus fasciculata – Rhus trilobata* Association

**Common Name:** Broom Baccharis – Desert Almond – Skunkbrush Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: 1004 m
Slope: 12°
Aspect: Northeast-facing

Tree Cover: 0.2%
Shrub Cover: 45%
Herb Cover: 10%

**Surface Covers:**
Large Rock: 4%
Small Rock: 39%
Fines: 40%
Litter: 15%

**Surveys Used in Description (N = 1):** JAWB0107

**Association Stand Table:**

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Juniperus californica* | 100 | 100. | 0.2 | 0.2 | 0.2 | X | X | | X |
| **Shrub** | | | | | | | | | |
| *Baccharis sergiloides* | 100 | 65.2 | 30.0 | 30.0 | 30.0 | X | X | | X |
| *Prunus fasciculata* | 100 | 26.1 | 12.0 | 12.0 | 12.0 | X | | | X |
| *Cleome isomeris* | 100 | 4.3 | 2.0 | 2.0 | 2.0 | X | | | X |
| *Salazaria mexicana* | 100 | 2.2 | 1.0 | 1.0 | 1.0 | X | | | X |
| *Ephedra nevadensis* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Atriplex canescens* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Eriogonum fasciculatum* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Forestiera pubescens* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Hymenoclea salsola* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Herb** | | | | | | | | | |
| *Bromus rubens* | 100 | 96.2 | 10.0 | 10.0 | 10.0 | X | X | | X |
| *Deinandra mohavensis* | 100 | 1.9 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Descurainia pinnata* | 100 | 1.9 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Non-vasc** | | | | | | | | | |
| Lichen | 100 | 100. | 2.0 | 2.0 | 2.0 | X | X | | X |

## *Baccharis salicifolia* Shrubland Alliance

**Common Name:** Mulefat thickets

**NVC Alliance Code:** A0933. *Baccharis salicifolia* Wet Shrubland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Baccharis salicifolia* | 1 | CEGL003549 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: 910 m
Slope: 1°
Aspect: Southeast-facing

Tree Cover: 4.2%
Shrub Cover: 27.0%
Herb Cover: 15.0%

**Surface Covers:**
Large Rock: 0.0%
Small Rock: 30.0%
Fines: 57.0%
Litter: 10.0%

**Conservation Status Rank: Global** G4; **State (California)** S4

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **1** | | | | | | | |

**Surveys Used in Description (N = 1):** JAWB0108

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Salix laevigata* | 100 | 75.0 | 3.0 | 3.0 | 3.0 | **x** | **x** | | **x** |
| | *Populus fremontii* | 100 | 25.0 | 1.0 | 1.0 | 1.0 | **x** | | | **x** |
| **Shrub** | | | | | | | | | | |
| | *Baccharis salicifolia* | 100 | 58.1 | 15.0 | 15.0 | 15.0 | **x** | **x** | | **x** |
| | *Forestiera pubescens* | 100 | 34.9 | 9.0 | 9.0 | 9.0 | **x** | | **x** | **x** |
| | *Ericameria nauseosa* | 100 | 3.9 | 1.0 | 1.0 | 1.0 | **x** | | | **x** |
| | *Tamarix ramosissima* | 100 | 0.8 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Cleome isomeris* | 100 | 0.8 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Senna armata* | 100 | 0.8 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Lepidium fremontii* | 100 | 0.8 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Polypogon monspeliensis* | 100 | 49.3 | 7.0 | 7.0 | 7.0 | **x** | | **x** | **x** |
| | *Bromus tectorum* | 100 | 14.1 | 2.0 | 2.0 | 2.0 | **x** | | | **x** |
| | *Datura wrightii* | 100 | 14.1 | 2.0 | 2.0 | 2.0 | **x** | | | **x** |
| | *Heliotropium curassavicum* | 100 | 7.0 | 1.0 | 1.0 | 1.0 | **x** | | | **x** |
| | *Bromus rubens* | 100 | 7.0 | 1.0 | 1.0 | 1.0 | **x** | | | **x** |
| | *Cirsium occidentale* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Mimulus guttatus* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Veronica anagallis-aquatica* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Senecio flaccidus* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Nicotiana quadrivalvis* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Loeseliastrum matthewsii* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| **Non-vasc** | | | | | | | | | | |
| | Algae | 100 | 100.0 | 0.2 | 0.2 | 0.2 | **x** | **x** | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Betula occidentalis* Shrubland Alliance

**Common Name:** Water birch thicket

**NVC Alliance Code:** A3772. *Betula occidentalis* Wet Shrubland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Betula occidentalis / Salix* spp. | 7 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1667 m, Range 1327 – 2167 m
Slope: Mean 7°, Range 2 – 22°
Aspect: Mostly northeast-facing

Tree Cover: Mean 49.5%, Range 17 – 90%
Shrub Cover: Mean 21.7%, Range 5 – 40%
Herb Cover: Mean 21.0%, Range 1 – 51%

**Surface Covers:**
Large Rock: Mean 3.9%, Range 0.0 –8%
Small Rock: Mean 10.3%, Range 0 – 30%
Fines: Mean 54.4%, Range 17 – 95%
Litter: Mean 18.7%, Range 0 – 60%

**Conservation Status Rank: Global** G4; **State (California)** S2

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | **3** | **4** | | | | | |

**Surveys Used in Description (N = 7):** OWVA0010, OWVA0020, OWVA0024, OWVA0033, SLTN0342, SLTN0352, SLTN0363

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Betula occidentalis* | 100 | 78.3 | 50.2 | 16.0 | 100 | **x** | **x** | | **x** |
| | *Salix* | 43 | 9.1 | 8.3 | 11.1 | 30.0 | | | | |
| | *Populus fremontii* | 29 | 2.0 | 1.8 | 1.2 | 11.1 | | | | |
| | *Populus balsamifera* ssp. *trichocarpa* | 29 | 4.2 | 1.4 | 4.0 | 6.0 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Rosa woodsii* | 86 | 12.5 | 2.6 | 0.1 | 7.0 | **x** | | | **x** |
| | *Salix exigua* | 71 | 27.9 | 7.3 | 0.2 | 25.0 | | | | **x** |
| | *Artemisia ludoviciana* | 71 | 10.0 | 1.9 | 0.2 | 5.0 | | | | **x** |
| | *Artemisia tridentata* | 71 | 7.4 | 1.6 | 0.1 | 5.0 | | | | **x** |
| | *Salix lasiolepis* | 57 | 23.9 | 4.6 | 4.0 | 12.0 | | | | **x** |
| | *Ericameria nauseosa* | 43 | 0.8 | 0.2 | 0.1 | 1.0 | | | | |
| | *Lupinus albifrons* | 43 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cornus sericea* | 29 | 14.1 | 0.7 | 0.2 | 5.0 | | | | |
| | *Frangula californica* | 29 | 1.1 | 0.2 | 0.2 | 1.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Solidago* | 57 | 5.5 | 1.4 | 0.1 | 8.0 | | | | **x** |
| | *Bromus tectorum* | 57 | 2.6 | 0.1 | 0.1 | 0.2 | | | | **x** |
| | *Bromus rubens* | 43 | 5.1 | 1.5 | 0.1 | 10.0 | | | | |
| | *Juncus mexicanus* | 43 | 4.7 | 0.3 | 0.2 | 2.0 | | | | |
| | *Carex* | 43 | 6.9 | 0.3 | 0.1 | 2.0 | | | | |
| | *Poa pratensis* | 43 | 3.7 | 0.2 | 0.1 | 1.0 | | | | |
| | *Muhlenbergia rigens* | 29 | 4.8 | 1.0 | 2.0 | 5.0 | | | | |
| | *Juncus* | 29 | 6.8 | 0.3 | 0.1 | 2.0 | | | | |
| | *Achillea millefolium* | 29 | 2.3 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Moss | 29 | 28.6 | 0.3 | 1.0 | 1.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Ceanothus cuneatus* Shrubland Alliance

**Common Name:** Wedge leaf ceanothus chaparral, Buck brush chaparral

**NVC Alliance Code:** A3869. *Ceanothus cuneatus* Chaparral Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Ceanothus cuneatus – Eriodictyon californicum – (Fremontodendron californicum)* | 1 | |
| *Ceanothus cuneatus* | 4 | CEGL003025 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1251 m, Range 1020 – 1403 m
Slope: Mean 27°, Range 22 – 30°
Aspect: Mostly northeast-facing

Tree Cover: Mean 0.9%, Range 0 – 3%
Shrub Cover: Mean 31.0%, Range 7 – 45%
Herb Cover: Mean 22.7%, Range 2 – 50%

**Surface Covers:**
Large Rock: Mean 0.1%, Range 0.0 –0.4%
Small Rock: Mean 17.7%, Range 3 – 30%
Fines: Mean 54.0%, Range 48 – 62%
Litter: Mean 25.0%, Range 15 – 40%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **3** | **1** | | | | | **1** | |

**Surveys Used in Description (N = 5):** ERSKBO73, JAWB0015, JAWB0017, JAWB0041, POA1504011546

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus sabiniana* | 60 | 31.2 | 0.2 | 0.2 | 0.4 | | | | **x** |
| | Standing snag | 40 | 35.3 | 1.2 | 3.0 | 3.0 | | | | |
| | *Quercus wislizeni* | 40 | 11.2 | 0.1 | 0.2 | 0.4 | | | | |
| | *Quercus douglasii* | 40 | 2.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Quercus ×alvordiana* | 20 | 20.0 | 0.0 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ceanothus cuneatus* | 100 | 71.1 | 22.8 | 4.0 | 40.0 | **x** | **x** | | **x** |
| | *Artemisia tridentata* | 40 | 6.6 | 0.8 | 2.0 | 2.0 | | | | |
| | *Fremontodendron californicum* | 20 | 7.1 | 3.0 | 15.0 | 15.0 | | | | |
| | *Ceanothus leucodermis* | 20 | 7.5 | 2.4 | 12.0 | 12.0 | | | | |
| | *Ericameria nauseosa* | 20 | 1.3 | 0.6 | 3.0 | 3.0 | | | | |
| | *Ericameria linearifolia* | 20 | 1.4 | 0.4 | 2.0 | 2.0 | | | | |
| | *Ribes quercetorum* | 20 | 0.9 | 0.4 | 2.0 | 2.0 | | | | |
| | *Quercus john-tuckeri* | 20 | 0.7 | 0.2 | 1.0 | 1.0 | | | | |
| | *Ceanothus greggii* var. *vestitus* | 20 | 2.9 | 0.2 | 1.0 | 1.0 | | | | |
| | *Cercocarpus montanus* var. *glaber* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Claytonia parviflora* | 60 | 18.3 | 2.0 | 0.2 | 5.0 | | | | **x** |
| | *Poa secunda* | 60 | 12.7 | 1.4 | 0.2 | 5.0 | | | | **x** |
| | *Marah horridus* | 60 | 0.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Amsinckia* | 40 | 3.8 | 2.0 | 0.2 | 10.0 | | | | |
| | *Bromus tectorum* | 40 | 7.3 | 1.4 | 3.0 | 4.0 | | | | |
| | *Bromus rubens* | 40 | 3.0 | 1.2 | 0.2 | 6.0 | | | | |
| | *Vulpia* | 40 | 2.1 | 0.8 | 0.2 | 4.0 | | | | |
| | *Cryptantha* | 40 | 0.9 | 0.4 | 0.2 | 2.0 | | | | |
| | *Chenopodium* | 40 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus arenarius* | 20 | 7.5 | 4.0 | 20.0 | 20.0 | | | | |
| | *Erodium cicutarium* | 20 | 6.9 | 3.2 | 16.0 | 16.0 | | | | |
| | *Bromus diandrus* | 20 | 5.6 | 3.0 | 15.0 | 15.0 | | | | |
| | *Avena* | 20 | 2.1 | 1.0 | 4.8 | 4.8 | | | | |
| | *Clarkia unguiculata* | 20 | 1.5 | 0.8 | 4.0 | 4.0 | | | | |
| | *Bromus hordeaceus* | 20 | 0.9 | 0.4 | 2.0 | 2.0 | | | | |
| | *Phacelia tanacetifolia* | 20 | 0.9 | 0.4 | 2.0 | 2.0 | | | | |
| | *Trichostema lanceolatum* | 20 | 0.9 | 0.4 | 2.0 | 2.0 | | | | |
| | *Plectritis ciliosa* | 20 | 0.7 | 0.4 | 2.0 | 2.0 | | | | |
| | *Nicotiana* | 20 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| | *Allophyllum gilioides* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Eriodictyon parryi* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Plagiobothrys nothofulvus* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Eriastrum brandegeeae* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Moss | 40 | 26.7 | 0.1 | 0.2 | 0.2 | | | | |
| | Lichen | 20 | 13.3 | 0.1 | 0.4 | 0.4 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Ceanothus cuneatus* Association

**Common Name:** Wedgeleaf Ceanothus Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1270 m, Range 1020 – 1403 m
Slope: Mean 29°, Range 27 – 30°
Aspect: Northeast-facing

Tree Cover: Mean 1.1%, Range 0 – 3%
Shrub Cover: Mean 28.8%, Range 7 – 45%
Herb Cover: Mean 15.9%, Range 2 – 46%

**Surface Covers:**
Large Rock: 0%
Small Rock: Mean 25.0%, Range 20 – 30%
Fines: Mean 55.0%, Range 48 – 62%
Litter: Mean 17.5%, Range 15 – 20%

**Surveys Used in Description (N = 4):** ERSKBO73, JAWB0015, JAWB0017, POA1504011546

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Pinus sabiniana* | 75 | 39.0 | 0.2 | 0.2 | 0.4 | X | | X | X |
| *Standing snag* | 50 | 44.1 | 1.5 | 3.0 | 3.0 | | | | X |
| *Quercus wislizeni* | 50 | 14.0 | 0.2 | 0.2 | 0.4 | | | | X |
| *Quercus douglasii* | 50 | 2.9 | 0.1 | 0.2 | 0.2 | | | | X |
| **Shrub** | | | | | | | | | |
| *Ceanothus cuneatus* | 100 | 74.0 | 22.3 | 4.0 | 40.0 | X | X | | X |
| *Artemisia tridentata* | 50 | 8.3 | 1.0 | 2.0 | 2.0 | | | | X |
| *Ceanothus leucodermis* | 25 | 9.3 | 3.0 | 12.0 | 12.0 | | | | |
| *Ericameria nauseosa* | 25 | 1.7 | 0.8 | 3.0 | 3.0 | | | | |
| *Ericameria linearifolia* | 25 | 1.8 | 0.5 | 2.0 | 2.0 | | | | |
| *Ceanothus greggii* var. *vestitus* | 25 | 3.6 | 0.3 | 1.0 | 1.0 | | | | |
| *Quercus john-tuckeri* | 25 | 0.9 | 0.3 | 1.0 | 1.0 | | | | |
| *Opuntia basilaris* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Cercocarpus montanus* var. *glaber* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Ribes roezlii* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Poa secunda* | 75 | 15.9 | 1.8 | 0.2 | 5.0 | X | | | X |
| | *Claytonia parviflora* | 50 | 22.7 | 2.5 | 5.0 | 5.0 | | | | X |
| | *Bromus tectorum* | 50 | 9.1 | 1.8 | 3.0 | 4.0 | | | | X |
| | *Bromus rubens* | 50 | 3.7 | 1.6 | 0.2 | 6.0 | | | | X |
| | *Vulpia* | 50 | 2.6 | 1.1 | 0.2 | 4.0 | | | | X |
| | *Chenopodium* | 50 | 0.9 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Marah horridus* | 50 | 0.6 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Erodium cicutarium* | 25 | 8.6 | 4.0 | 16.0 | 16.0 | | | | |
| | *Avena* | 25 | 2.6 | 1.2 | 4.8 | 4.8 | | | | |
| | *Phacelia tanacetifolia* | 25 | 1.1 | 0.5 | 2.0 | 2.0 | | | | |
| | *Cryptantha* | 25 | 1.1 | 0.5 | 2.0 | 2.0 | | | | |
| | *Bromus hordeaceus* | 25 | 1.1 | 0.5 | 2.0 | 2.0 | | | | |
| | *Trichostema lanceolatum* | 25 | 1.1 | 0.5 | 2.0 | 2.0 | | | | |
| | *Ehrendorferia chrysantha* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Elymus elymoides* | 25 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Nicotiana* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Mimulus whitneyi* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Mimulus bigelovii* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Microseris sylvatica* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cryptantha pterocarya* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Hirschfeldia incana* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Claytonia exigua* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriophyllum* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Emmenanthe penduliflora* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Coreopsis bigelovii* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus madritensis* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Senecio flaccidus* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Silene californica* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Agoseris* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Thysanocarpus laciniatus* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Amsinckia* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriastrum sparsiflorum* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Plagiobothrys nothofulvus* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriodictyon parryi* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Moss | 25 | 25.0 | 0.1 | 0.2 | 0.2 | | | | |

## *Ceanothus cuneatus – Eriodictyon californicum – (Fremontodendron californicum)* Provisional Association

**Common Name:** Wedgeleaf Ceanothus – California Yerba Santa – (California Fremontia) Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: 1176 m
Slope: 22°
Aspect: Northwest-facing

Tree Cover: 0%
Shrub Cover: 40%
Herb Cover: 50%

**Surface Covers:**
Large Rock: 0.4%
Small Rock: 3%
Fines: 52%
Litter: 40%

**Surveys Used in Description (N = 1):** JAWB0041

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Quercus ×alvordiana* | 100 | 100. | 0.2 | 0.2 | 0.2 | X | X | | X |
| **Shrub** | | | | | | | | | | |
| | *Ceanothus cuneatus* | 100 | 59.2 | 25.0 | 25.0 | 25.0 | X | X | | X |
| | *Fremontodendron californicum* | 100 | 35.5 | 15.0 | 15.0 | 15.0 | X | | X | X |
| | *Ribes quercetorum* | 100 | 4.7 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Rhamnus ilicifolia* | 100 | 0.5 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Herb** | | | | | | | | | | |
| | *Bromus arenarius* | 100 | 37.3 | 20.0 | 20.0 | 20.0 | X | | X | X |
| | *Bromus diandrus* | 100 | 28.0 | 15.0 | 15.0 | 15.0 | X | | | X |
| | *Amsinckia* | 100 | 18.7 | 10.0 | 10.0 | 10.0 | X | | | X |
| | *Clarkia unguiculata* | 100 | 7.5 | 4.0 | 4.0 | 4.0 | X | | | X |
| | *Plectritis ciliosa* | 100 | 3.7 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Marah horridus* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Eriastrum brandegeeae* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Bowlesia incana* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Allophyllum gilioides* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Galium aparine* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Claytonia parviflora* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Cryptantha* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Delphinium* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Athysanus pusillus* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Thysanocarpus curvipes* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Uropappus lindleyi* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Stylomecon heterophylla* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Phacelia cicutaria* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 100 | 66.7 | 0.4 | 0.4 | 0.4 | X | X | | X |
| | Moss | 100 | 33.3 | 0.2 | 0.2 | 0.2 | X | | X | X |

## *Ceanothus greggii – Fremontodendron californicum* Shrubland Alliance

**Common Name:** Cup leaf ceanothus chaparral

**NVC Alliance Code:** A3790. *Arctostaphylos pungens - Arctostaphylos pringlei - Ceanothus greggii* Chaparral Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Ceanothus greggii (*var. *vestitus,* var. *perplexans)* | 12 | CEPP005938 |
| *Fremontodendron californicum* | 8 | CEGL003026 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1953 m, Range 1006 – 2748 m
Slope: Mean 24°, Range 0 – 49°
Aspect: Variable

Tree Cover: Mean 3.1%, Range 0 – 13%
Shrub Cover: Mean 33.2%, Range 4 – 75%
Herb Cover: Mean 24.5%, Range 1 – 76%

**Surface Covers:**
Large Rock: Mean 7.6%, Range 0.0 –24%
Small Rock: Mean 32.0%, Range 6 – 60%
Fines: Mean 38.0%, Range 1 – 70%
Litter: Mean 3.0%, Range 0 – 23%

**Conservation Status Rank: Global** G4; **State (California)** S3

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **2** | **5** | **10** | | | | **1** | | **2** |

**Surveys Used in Description (N = 20):** CHIMMH75, CHIMPJ74, DEVAD127, DEVAD128, ERSKJU32, ERSKJU35, ERSKJU36, ERSKMC45, JAWB0004, JAWB0202, JAWB0204, JAWB0209, SLTN0284, SLTN0315, SLTN0317, SLTN0353, SLTN0369, SLTN0551, SLTN0576, SLTN0988

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | Standing snag | 35 | 30.9 | 1.6 | 2.0 | 10.1 | | | | |
| | *Pinus monophylla* | 30 | 25.3 | 0.5 | 0.1 | 4.0 | | | | |
| | *Yucca brevifolia* | 20 | 0.9 | 0.0 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ceanothus greggii* var. *vestitus* | 85 | 44.5 | 18.6 | 0.2 | 65.0 | **x** | | **x** | **x** |
| | *Artemisia tridentata* | 65 | 6.0 | 3.1 | 0.1 | 20.0 | | | | **x** |
| | *Ericameria nauseosa* | 55 | 5.0 | 1.5 | 0.1 | 12.0 | | | | **x** |
| | *Fremontodendron californicum* | 50 | 20.5 | 4.5 | 0.7 | 40.0 | | | | **x** |
| | *Ephedra viridis* | 40 | 3.6 | 0.7 | 0.2 | 5.0 | | | | |
| | *Eriogonum umbellatum* | 35 | 1.0 | 0.4 | 0.1 | 4.0 | | | | |
| | *Lupinus excubitus* | 30 | 3.8 | 0.3 | 0.2 | 2.7 | | | | |
| | *Chrysothamnus viscidiflorus* | 25 | 1.3 | 0.3 | 0.1 | 5.0 | | | | |
| | *Purshia glandulosa* | 20 | 1.0 | 0.5 | 0.2 | 5.0 | | | | |
| | *Tetradymia canescens* | 20 | 0.3 | 0.1 | 0.1 | 1.0 | | | | |
| | *Eriogonum microthecum* | 20 | 0.2 | 0.1 | 0.1 | 1.0 | | | | |
| | *Ericameria linearifolia* | 20 | 0.3 | 0.0 | 0.2 | 0.2 | | | | |
| | *Keckiella breviflora* | 20 | 0.4 | 0.0 | 0.1 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 85 | 25.9 | 6.4 | 0.1 | 30.0 | **x** | | | **x** |
| | *Achnatherum speciosum* | 65 | 1.3 | 0.2 | 0.1 | 1.0 | | | | **x** |
| | *Poa secunda* | 40 | 1.5 | 0.5 | 0.2 | 2.3 | | | | |
| | *Eriophyllum* | 40 | 1.0 | 0.3 | 0.1 | 3.2 | | | | |
| | *Elymus elymoides* | 40 | 1.0 | 0.2 | 0.1 | 2.0 | | | | |
| | *Argemone munita* | 35 | 0.2 | 0.1 | 0.1 | 0.2 | | | | |
| | *Mentzelia albicaulis* | 30 | 1.6 | 0.6 | 0.1 | 4.0 | | | | |
| | *Stephanomeria exigua* | 25 | 1.8 | 1.1 | 0.1 | 18.3 | | | | |
| | *Eriogonum* | 25 | 3.4 | 0.5 | 0.1 | 10.1 | | | | |
| | *Cryptantha circumscissa* | 25 | 0.8 | 0.3 | 0.1 | 4.5 | | | | |
| | *Layia glandulosa* | 25 | 0.7 | 0.3 | 0.1 | 3.5 | | | | |
| | *Gilia leptantha* | 20 | 3.3 | 1.3 | 0.1 | 14.4 | | | | |
| | *Eriogonum baileyi* | 20 | 0.6 | 0.2 | 0.2 | 4.0 | | | | |
| | *Leymus triticoides* | 20 | 0.9 | 0.2 | 0.2 | 2.0 | | | | |
| | *Sisymbrium* | 20 | 0.8 | 0.2 | 0.1 | 2.0 | | | | |
| | *Linanthus pungens* | 20 | 4.2 | 0.2 | 0.1 | 3.0 | | | | |
| | *Emmenanthe penduliflora* | 20 | 0.2 | 0.1 | 0.2 | 2.0 | | | | |
| | *Coreopsis bigelovii* | 20 | 0.4 | 0.1 | 0.1 | 2.0 | | | | |
| | *Erigeron foliosus* | 20 | 0.2 | 0.1 | 0.2 | 1.0 | | | | |
| | *Monardella odoratissima* | 20 | 2.7 | 0.1 | 0.1 | 1.0 | | | | |
| | *Penstemon grinnellii* ssp. *scrophularioides* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Phacelia fremontii* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Chaenactis xantiana* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Eriastrum* | 20 | 0.4 | 0.0 | 0.1 | 0.2 | | | | |
| | *Collinsia callosa* | 20 | 0.4 | 0.0 | 0.1 | 0.2 | | | | |
| | *Gayophytum diffusum* | 20 | 0.4 | 0.0 | 0.1 | 0.2 | | | | |
| | *Achnatherum hymenoides* | 20 | 0.3 | 0.0 | 0.1 | 0.1 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Ceanothus greggii (*var. *vestitus,* var. *perplexans)* Association

**Common Name:** Cupleaf Ceanothus Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 2202 m, Range 1732 – 2748 m
Slope: Mean 21°, Range 9 – 31°
Aspect: Variable

Tree Cover: Mean 2.2%, Range 0 – 11%
Shrub Cover: Mean 43.0%, Range 9 – 75%
Herb Cover: Mean 18.4%, Range 1 – 41%

**Surface Covers:**
Large Rock: Mean 6.6%, Range 0.0 –20%
Small Rock: Mean 35.2%, Range 10 – 60%
Fines: Mean 32.9%, Range 1 – 60%
Litter: Mean 0.3%, Range 0 – 2%

**Surveys Used in Description (N = 12):** CHIMPJ74, DEVAD127, DEVAD128, JAWB0209, SLTN0284, SLTN0315, SLTN0317, SLTN0353, SLTN0369, SLTN0551, SLTN0576, SLTN0988

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus monophylla* | 33 | 26.5 | 0.3 | 0.1 | 2.0 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Ceanothus greggii var. vestitus* | 100 | 70.6 | 30.6 | 4.7 | 65.0 | X | X | | X |
| | *Artemisia tridentata* | 83 | 8.5 | 4.9 | 0.1 | 20.0 | X | | | X |
| | *Ericameria nauseosa* | 58 | 3.5 | 1.3 | 0.1 | 12.0 | | | | X |
| | *Eriogonum umbellatum* | 42 | 1.1 | 0.7 | 0.1 | 4.0 | | | | |
| | *Chrysothamnus viscidiflorus* | 33 | 1.7 | 0.4 | 0.1 | 5.0 | | | | |
| | *Tetradymia canescens* | 33 | 0.5 | 0.2 | 0.1 | 1.0 | | | | |
| | *Eriogonum microthecum* | 33 | 0.3 | 0.1 | 0.1 | 1.0 | | | | |
| | *Arctostaphylos patula* | 25 | 2.1 | 1.3 | 0.1 | 15.0 | | | | |
| | *Purshia glandulosa* | 25 | 1.5 | 0.8 | 1.0 | 5.0 | | | | |
| | *Purshia tridentata* | 25 | 0.3 | 0.2 | 0.1 | 1.0 | | | | |
| | *Prunus andersonii* | 25 | 0.2 | 0.1 | 0.1 | 1.0 | | | | |
| | *Opuntia polyacantha var. erinacea* | 25 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 75 | 25.2 | 6.3 | 0.1 | 30.0 | X | | | X |
| | *Achnatherum speciosum* | 50 | 0.9 | 0.1 | 0.1 | 0.2 | | | | X |
| | *Elymus elymoides* | 50 | 1.1 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Eriogonum* | 42 | 5.6 | 0.9 | 0.1 | 10.1 | | | | |
| | *Linanthus pungens* | 33 | 7.0 | 0.3 | 0.1 | 3.0 | | | | |
| | *Gayophytum diffusum* | 33 | 0.7 | 0.0 | 0.1 | 0.2 | | | | |
| | *Achnatherum hymenoides* | 33 | 0.5 | 0.0 | 0.1 | 0.1 | | | | |
| | *Penstemon rostriflorus* | 25 | 3.5 | 0.9 | 0.1 | 10.0 | | | | |
| | *Monardella odoratissima* | 25 | 4.4 | 0.1 | 0.1 | 1.0 | | | | |
| | *Eriophyllum* | 25 | 0.1 | 0.0 | 0.1 | 0.2 | | | | |
| | *Cryptantha circumscissa* | 25 | 0.3 | 0.0 | 0.1 | 0.2 | | | | |
| | *Eriastrum* | 25 | 0.6 | 0.0 | 0.1 | 0.2 | | | | |
| | *Penstemon patens* | 25 | 0.5 | 0.0 | 0.1 | 0.1 | | | | |
| | *Collinsia callosa* | 25 | 0.6 | 0.0 | 0.1 | 0.1 | | | | |

## *Fremontodendron californicum* Association

**Common Name:** California Fremontia Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1581 m, Range 1006 – 2128 m
Slope: Mean 29°, Range 0 – 49°
Aspect: Variable

Tree Cover: Mean 4.4%, Range 0 – 13%
Shrub Cover: Mean 18.3%, Range 4 – 48%
Herb Cover: Mean 33.7%, Range 11 – 76%

**Surface Covers:**
Large Rock: Mean 10.7%, Range 0.2 –24%
Small Rock: Mean 22.4%, Range 6 – 47%
Fines: Mean 53.3%, Range 45 – 70%
Litter: Mean 11.3%, Range 5 – 23%

**Surveys Used in Description (N = 8):** CHIMMH75, ERSKJU32, ERSKJU35, ERSKJU36, ERSKMC45, JAWB0004, JAWB0202, JAWB0204

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | Standing snag | 63 | 52.2 | 2.4 | 2.0 | 5.3 | | | | X |
| | *Yucca brevifolia* | 50 | 2.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Pinus monophylla* | 25 | 23.4 | 0.8 | 2.2 | 4.0 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Fremontodendron californicum* | 100 | 44.6 | 10.5 | 0.7 | 40.0 | X | | X | X |
| | *Ephedra viridis* | 75 | 7.2 | 1.0 | 0.2 | 4.0 | X | | | X |
| | *Ceanothus greggii* var. *vestitus* | 63 | 5.4 | 0.5 | 0.2 | 2.8 | | | | X |
| | *Ericameria nauseosa* | 50 | 7.1 | 1.7 | 1.0 | 7.0 | | | | X |
| | *Lupinus excubitus* | 50 | 9.0 | 0.8 | 0.2 | 2.7 | | | | X |
| | *Hesperoyucca whipplei* | 38 | 3.9 | 0.7 | 0.2 | 4.0 | | | | |
| | *Artemisia tridentata* | 38 | 2.2 | 0.6 | 0.2 | 4.0 | | | | |
| | *Ericameria linearifolia* | 38 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Keckiella breviflora* | 38 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Opuntia basilaris* | 38 | 1.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Lotus procumbens* | 25 | 1.9 | 0.3 | 0.2 | 2.0 | | | | |
| | Shrub (>.5m) | 25 | 3.1 | 0.3 | 0.2 | 2.0 | | | | |
| | *Eriogonum umbellatum* | 25 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Encelia actonii* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | |
| *Bromus tectorum* | 100 | 27.0 | 6.5 | 0.2 | 13.0 | X | | | X |
| *Poa secunda* | 88 | 3.6 | 1.2 | 0.2 | 2.3 | X | | | X |
| *Achnatherum speciosum* | 88 | 1.9 | 0.4 | 0.2 | 1.0 | X | | | X |
| *Eriophyllum* | 63 | 2.3 | 0.7 | 0.2 | 3.2 | | | | X |
| *Argemone munita* | 63 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| *Mentzelia albicaulis* | 50 | 3.7 | 1.5 | 1.6 | 4.0 | | | | X |
| *Leymus triticoides* | 50 | 2.1 | 0.6 | 0.2 | 2.0 | | | | X |
| *Phacelia fremontii* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| *Stephanomeria exigua* | 38 | 3.9 | 2.7 | 0.2 | 18.3 | | | | |
| *Leptosiphon aureus* | 38 | 3.6 | 2.0 | 0.2 | 9.0 | | | | |
| *Layia glandulosa* | 38 | 1.4 | 0.7 | 0.2 | 3.5 | | | | |
| *Eriogonum baileyi* | 38 | 1.3 | 0.6 | 0.2 | 4.0 | | | | |
| *Emmenanthe penduliflora* | 38 | 0.5 | 0.3 | 0.2 | 2.0 | | | | |
| *Coreopsis bigelovii* | 38 | 0.7 | 0.3 | 0.2 | 2.0 | | | | |
| *Erigeron foliosus* | 38 | 0.4 | 0.2 | 0.2 | 1.0 | | | | |
| *Penstemon grinnellii* ssp. *scrophularioides* | 38 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Erysimum capitatum* | 38 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Phacelia cicutaria* | 38 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Chaenactis xantiana* | 38 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Gilia leptantha* | 25 | 3.3 | 2.2 | 3.6 | 14.4 | | | | |
| *Erodium cicutarium* | 25 | 5.4 | 1.9 | 4.0 | 11.2 | | | | |
| *Bromus rubens* | 25 | 4.6 | 1.5 | 1.0 | 10.7 | | | | |
| *Cryptantha circumscissa* | 25 | 1.5 | 0.8 | 2.0 | 4.5 | | | | |
| *Elymus elymoides* | 25 | 0.8 | 0.4 | 1.0 | 2.0 | | | | |
| *Phacelia tanacetifolia* | 25 | 1.0 | 0.3 | 0.2 | 2.0 | | | | |
| *Sisymbrium* | 25 | 0.6 | 0.2 | 0.2 | 1.0 | | | | |
| *Cirsium occidentale* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Eriogonum inflatum* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Microseris lindleyi* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| *Monardella linoides* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |

## *Cercocarpus montanus* Shrubland Alliance

**Common Name:** Birch leaf mountain mahogany chaparral

**NVC Alliance Code:** A0587. *Cercocarpus montanus* var*. glaber* Mesic Chaparral Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Cercocarpus montanus – Ceanothus cuneatus – Quercus john-tuckeri* | 1 | |
| *Cercocarpus montanus – Eriogonum fasciculatum* | 1 | |
| *Cercocarpus montanus* var. *glaber* | 4 | CEGL003615 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1413 m, Range 1131 – 1503 m
Slope: Mean 23°, Range 18 – 25°
Aspect: North-facing

Tree Cover: Mean 1.5%, Range 0 – 3%
Shrub Cover: Mean 30.8%, Range 9 – 65%
Herb Cover: Mean 12.4%, Range 3 – 22%

**Surface Covers:**
Large Rock: Mean 0.1%, Range 0.0 –0.2%
Small Rock: Mean 21.6%, Range 6 – 44%
Fines: Mean 43.5%, Range 16 – 56%
Litter: Mean 32.5%, Range 5 – 75%

**Conservation Status Rank: Global** G5; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **1** | **5** | | | | | | |

**Surveys Used in Description (N = 6):** JAWB0025, POA1504011410, TEHA0033, TEHA0035, TEJO0101, ZOE1504021321

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus sabiniana* | 67 | 35.8 | 0.9 | 0.2 | 3.0 | | | | **x** |
| | *Juniperus californica* | 33 | 18.7 | 0.4 | 0.2 | 2.0 | | | | |
| | *Pinus monophylla* | 33 | 6.6 | 0.2 | 0.2 | 1.0 | | | | |
| | *Quercus wislizeni* | 33 | 25.0 | 0.1 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Cercocarpus montanus* var. *glaber* | 100 | 71.6 | 25.0 | 3.0 | 64.0 | **x** | **x** | | **x** |
| | *Artemisia tridentata* | 33 | 2.9 | 0.5 | 1.0 | 2.0 | | | | |
| | *Fremontodendron californicum* | 33 | 0.6 | 0.4 | 0.2 | 2.0 | | | | |
| | *Ceanothus cuneatus* | 33 | 1.8 | 0.2 | 0.2 | 1.0 | | | | |
| | *Ericameria linearifolia* | 33 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Poa secunda* | 67 | 37.8 | 1.7 | 2.0 | 4.0 | | | | **x** |
| | *Bromus tectorum* | 33 | 27.2 | 5.0 | 15.0 | 15.0 | | | | |
| | *Bromus rubens* | 33 | 7.1 | 0.4 | 0.2 | 2.0 | | | | |
| | *Bromus diandrus* | 33 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Cercocarpus montanus – Ceanothus cuneatus – Quercus john-tuckeri* Association

**Common Name:** Birchleaf Mountain-mahogany – Wedgeleaf Ceanothus – Tucker Oak Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: 1503 m
Slope: 18°
Aspect: Northeast-facing

Tree Cover: 2%
Shrub Cover: 28%
Herb Cover: 22%

**Surface Covers:**
Large Rock: 0%
Small Rock: 6%
Fines: 16%
Litter: 75%

**Surveys Used in Description (N = 1):** TEHA0033

**Association Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus sabiniana* | 100 | 100. | 2.0 | 2.0 | 2.0 | X | X | | X |
| **Shrub** | | | | | | | | | | |
| | *Quercus john-tuckeri* | 100 | 53.6 | 15.0 | 15.0 | 15.0 | X | X | | X |
| | *Cercocarpus montanus* var. *glaber* | 100 | 46.4 | 13.0 | 13.0 | 13.0 | X | | X | X |
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 100 | 64.7 | 15.0 | 15.0 | 15.0 | X | X | | X |
| | *Bromus carinatus* | 100 | 34.5 | 8.0 | 8.0 | 8.0 | X | | X | X |
| | *Dichelostemma capitatum* | 100 | 0.9 | 0.2 | 0.2 | 0.2 | X | | | X |

## *Cercocarpus montanus – Eriogonum fasciculatum* Association

**Common Name:** Birchleaf Mountain-mahogany – California Buckwheat Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: 1432 m
Slope: no data
Aspect: no data

Tree Cover: 0.4%
Shrub Cover: 9.0%
Herb Cover: 0.0 %

**Surface Covers:**
Large Rock: no data
Small Rock: no data
Fines: no data
Litter: no data

**Surveys Used in Description (N = 1):** POA1504011410

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Quercus ×alvordiana* | 100 | 83.3 | 2.0 | 2.0 | 2.0 | X | X | | X |
| *Pinus sabiniana* | 100 | 8.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Pinus monophylla* | 100 | 8.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Shrub** | | | | | | | | | |
| *Eriogonum fasciculatum* | 100 | 53.2 | 5.0 | 5.0 | 5.0 | X | X | | X |
| *Cercocarpus montanus* var. *glaber* | 100 | 31.9 | 3.0 | 3.0 | 3.0 | X | | X | X |
| *Ceanothus cuneatus* | 100 | 10.6 | 1.0 | 1.0 | 1.0 | X | | | X |
| *Ericameria linearifolia* | 100 | 2.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Ericameria nauseosa* | 100 | 2.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Herb** | | | | | | | | | |
| *Bromus madritensis* | 100 | 50.0 | 2.0 | 2.0 | 2.0 | X | X | | X |
| *Poa secunda* | 100 | 50.0 | 2.0 | 2.0 | 2.0 | X | X | | X |

## *Cercocarpus montanus* var. *glaber* Association

**Common Name:** Birchleaf Mountain-mahogany Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1386 m, Range 1131 – 1481 m
Slope: Mean 24°, Range 23 – 25°
Aspect: North-facing

Tree Cover: Mean 1.7%, Range 0 – 3%
Shrub Cover: Mean 37.0%, Range 13 – 65%
Herb Cover: Mean 10.0%, Range 3 – 17%

**Surface Covers:**
Large Rock: Mean 0.1%, Range 0.0 –0.2%
Small Rock: Mean 26.7%, Range 6 – 44%
Fines: Mean 52.7%, Range 50 – 56%
Litter: Mean 18.3%, Range 5 – 35%

**Surveys Used in Description (N = 4):** JAWB0025, TEHA0035, TEJO0101, ZOE1504021321

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus sabiniana* | 50 | 26.6 | 0.8 | 0.2 | 3.0 | | | | X |
| | *Juniperus californica* | 50 | 28.1 | 0.6 | 0.2 | 2.0 | | | | X |
| | *Quercus wislizeni* | 50 | 37.5 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Pinus monophylla* | 25 | 7.8 | 0.3 | 1.0 | 1.0 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Cercocarpus montanus* var. *glaber* | 100 | 87.9 | 33.5 | 12.0 | 64.0 | X | X | | X |
| | *Artemisia tridentata* | 50 | 4.4 | 0.8 | 1.0 | 2.0 | | | | X |
| | *Fremontodendron californicum* | 50 | 1.0 | 0.6 | 0.2 | 2.0 | | | | X |
| | *Garrya flavescens* | 25 | 4.4 | 2.5 | 10.0 | 10.0 | | | | |
| | *Lonicera interrupta* | 25 | 1.3 | 0.8 | 3.0 | 3.0 | | | | |
| | *Arctostaphylos viscida* | 25 | 0.4 | 0.3 | 1.0 | 1.0 | | | | |
| | *Symphoricarpos mollis* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Adenostoma fasciculatum* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Ceanothus cuneatus* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Hesperoyucca whipplei* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Ericameria linearifolia* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Poa secunda* | 75 | 44.2 | 2.0 | 2.0 | 4.0 | X | | X | X |
| | *Bromus rubens* | 50 | 10.6 | 0.6 | 0.2 | 2.0 | | | | X |
| | *Bromus diandrus* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Bromus tectorum* | 25 | 24.7 | 3.8 | 15.0 | 15.0 | | | | |
| | *Eriophyllum confertiflorum* | 25 | 4.8 | 0.3 | 1.0 | 1.0 | | | | |
| | Forb (herbaceous, not grass nor grasslike) | 25 | 1.9 | 0.1 | 0.4 | 0.4 | | | | |
| | *Emmenanthe penduliflora* | 25 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Apiastrum angustifolium* | 25 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Marah horridus* | 25 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Melica californica* | 25 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Osmorhiza brachypoda* | 25 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus hordeaceus* | 25 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Salvia columbariae* | 25 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 25 | 25.0 | 0.1 | 0.2 | 0.2 | | | | |

## *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* (alliance) | 5 | A3144 |
| *Coleogyne ramosissima – Eriogonum fasciculatum* | 10 | CEGL001333 |
| *Coleogyne ramosissima – Ephedra* spp. | 25 | CEGL005297 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1519 m, Range 963 – 2141 m
Slope: Mean 15°, Range 0 – 31°
Aspect: Variable

Tree Cover: Mean 0.3%, Range 0 – 1%
Shrub Cover: Mean 16.3%, Range 0 – 40%
Herb Cover: Mean 9.4%, Range 0 – 35%

**Surface Covers:**
Large Rock: Mean 7.6%, Range 0.0 –30%
Small Rock: Mean 57.7%, Range 0 – 96%
Fines: Mean 16.5%, Range 0 – 63%
Litter: Mean 2.6%, Range 0 – 20%

**Conservation Status Rank: Global** G5; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **2** | **3** | **3** | | **11** | | **1** | | **20** |

**Surveys Used in Description (N = 40):** C06011438, DEVA9148, DEVA9261, DEVA9354, DEVA9370, DEVA9371, DEVA9376, DEVA9378, DEVA9403, DEVA9506, DEVA9609, DEVA9612, DEVAD123, DEVAD251, DEVAS213, DEVAS228, F1806051057, JAWB0100, JAWB0110, JAWB0116, MOJC0330, MOJC0331, MOJC0332, MOJC0448, MOJC0453, MOJC0454, MOJC0465, MOJC0530, MOJC0610, MOJC0612, MOJC0658, MOJC0660, MOJC0963, MOJC0992, SLTN0245, SLTN0247, SLTN0248, SLTN0622, SLTN0867, SLTN1210

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Yucca brevifolia* | 26 | 24.3 | 0.1 | 0.1 | 1.2 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Coleogyne ramosissima* | 100 | 41.3 | 9.1 | 2.0 | 25.0 | **x** | | **x** | **x** |
| | *Ephedra nevadensis* | 80 | 8.1 | 1.6 | 0.2 | 10.0 | **x** | | | **x** |
| | *Eriogonum fasciculatum* | 76 | 4.8 | 1.0 | 0.1 | 8.0 | **x** | | | **x** |
| | *Lycium andersonii* | 46 | 1.6 | 0.2 | 0.1 | 1.5 | | | | |
| | *Krascheninnikovia lanata* | 43 | 1.3 | 0.2 | 0.1 | 2.0 | | | | |
| | *Grayia spinosa* | 41 | 1.8 | 0.4 | 0.1 | 6.0 | | | | |
| | *Ericameria cooperi* | 35 | 2.1 | 0.4 | 0.1 | 4.0 | | | | |
| | *Tetradymia axillaris* | 35 | 1.2 | 0.2 | 0.1 | 1.5 | | | | |
| | *Hymenoclea salsola* | 33 | 3.6 | 0.7 | 0.2 | 15.0 | | | | |
| | *Thamnosma montana* | 30 | 1.1 | 0.2 | 0.2 | 2.0 | | | | |
| | *Ericameria teretifolia* | 26 | 1.0 | 0.2 | 0.1 | 3.0 | | | | |
| | *Ephedra viridis* | 24 | 2.8 | 0.6 | 0.5 | 10.0 | | | | |
| | *Atriplex confertifolia* | 24 | 3.1 | 0.5 | 1.0 | 3.5 | | | | |
| | *Menodora spinescens* | 24 | 2.1 | 0.4 | 0.2 | 9.0 | | | | |
| | *Salazaria mexicana* | 22 | 1.8 | 0.4 | 0.2 | 4.0 | | | | |
| | *Psorothamnus arborescens* | 22 | 1.5 | 0.3 | 0.5 | 3.0 | | | | |
| | *Ericameria laricifolia* | 22 | 1.6 | 0.3 | 0.2 | 6.0 | | | | |
| | *Artemisia tridentata* | 22 | 0.8 | 0.2 | 0.1 | 2.0 | | | | |
| | *Opuntia basilaris* | 22 | 0.5 | 0.1 | 0.1 | 0.5 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 78 | 27.3 | 2.4 | 0.1 | 35.0 | **x** | | | **x** |
| | *Achnatherum speciosum* | 65 | 9.3 | 0.3 | 0.1 | 3.0 | | | | **x** |
| | *Amsinckia* | 37 | 3.2 | 0.2 | 0.1 | 2.0 | | | | |
| | *Sphaeralcea ambigua* | 33 | 3.4 | 0.1 | 0.1 | 0.5 | | | | |
| | *Poa secunda* | 26 | 5.7 | 0.4 | 0.1 | 5.0 | | | | |
| | *Delphinium* | 22 | 0.9 | 0.0 | 0.1 | 0.5 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 30 | 19.5 | 0.2 | 0.2 | 5.0 | | | | |
| | *Cryptogammic crust* | 24 | 16.2 | 0.2 | 0.2 | 2.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Coleogyne ramosissima – Ephedra* spp. Association

**Common Name:** Blackbush – Nevada Ephedra Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1591 m, Range 1127 – 2141 m
Slope: Mean 14°, Range 0 – 31°
Aspect: Mostly northeast-facing, but variable

Tree Cover: Mean 0.3%, Range 0 – 1%
Shrub Cover: Mean 16.2%, Range 0 – 40%
Herb Cover: Mean 8.0%, Range 0 – 29%

**Surface Covers:**
Large Rock: Mean 7.7%, Range 0.0 –28%
Small Rock: Mean 59.6%, Range 10 – 96%
Fines: Mean 13.0%, Range 0 – 48%
Litter: Mean 3.2%, Range 0 – 20%

**Surveys Used in Description (N = 25):** DEVA9370, DEVA9371, DEVA9376, DEVA9378, DEVA9403, DEVA9506, DEVA9609, DEVA9612, DEVAS213, DEVAS228, JAWB0116, MOJC0330, MOJC0331, MOJC0332, MOJC0448, MOJC0453, MOJC0454, MOJC0530, MOJC0610, MOJC0612, MOJC0992, SLTN0245, SLTN0247, SLTN0622, SLTN1210

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Coleogyne ramosissima* | 100 | 43.5 | 9.8 | 2.0 | 25.0 | X | | X | X |
| | *Ephedra nevadensis* | 89 | 11.0 | 2.3 | 0.2 | 10.0 | X | | | X |
| | *Eriogonum fasciculatum* | 71 | 2.5 | 0.6 | 0.1 | 5.0 | | | | X |
| | *Lycium andersonii* | 64 | 2.3 | 0.4 | 0.1 | 1.5 | | | | X |
| | *Krascheninnikovia lanata* | 50 | 1.8 | 0.3 | 0.1 | 2.0 | | | | X |
| | *Grayia spinosa* | 43 | 2.1 | 0.5 | 0.1 | 6.0 | | | | |
| | *Tetradymia axillaris* | 43 | 1.4 | 0.2 | 0.1 | 1.5 | | | | |
| | *Ericameria cooperi* | 36 | 1.7 | 0.3 | 0.1 | 4.0 | | | | |
| | *Menodora spinescens* | 32 | 2.5 | 0.5 | 0.2 | 9.0 | | | | |
| | *Thamnosma montana* | 32 | 0.9 | 0.2 | 0.2 | 1.5 | | | | |
| | *Atriplex confertifolia* | 29 | 3.5 | 0.5 | 1.0 | 3.5 | | | | |
| | *Hymenoclea salsola* | 29 | 1.4 | 0.3 | 0.2 | 3.0 | | | | |
| | *Ephedra viridis* | 25 | 4.2 | 0.9 | 0.5 | 10.0 | | | | |
| | *Ambrosia dumosa* | 25 | 1.7 | 0.3 | 0.2 | 4.0 | | | | |
| | *Artemisia tridentata* | 25 | 1.1 | 0.2 | 0.1 | 2.0 | | | | |
| | *Larrea tridentata* | 21 | 2.2 | 0.4 | 0.5 | 3.0 | | | | |
| | Plant | 21 | 1.5 | 0.2 | 0.5 | 1.5 | | | | |
| | *Ericameria teretifolia* | 21 | 0.5 | 0.1 | 0.1 | 1.0 | | | | |
| | *Xylorhiza tortifolia* | 21 | 0.7 | 0.1 | 0.5 | 0.5 | | | | |
| | *Opuntia basilaris* | 21 | 0.5 | 0.1 | 0.1 | 0.5 | | | | |
| | *Ericameria laricifolia* | 21 | 0.3 | 0.1 | 0.2 | 0.5 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 75 | 27.0 | 2.1 | 0.2 | 20.0 | X | | | X |
| | *Achnatherum speciosum* | 71 | 9.6 | 0.4 | 0.1 | 2.0 | | | | X |
| | *Amsinckia* | 39 | 3.7 | 0.2 | 0.1 | 2.0 | | | | |
| | *Sphaeralcea ambigua* | 29 | 3.6 | 0.1 | 0.1 | 0.5 | | | | |
| | *Delphinium* | 29 | 1.3 | 0.1 | 0.1 | 0.5 | | | | |
| | *Eriogonum* | 25 | 1.4 | 0.1 | 0.1 | 1.0 | | | | |
| | *Phacelia* | 25 | 0.8 | 0.0 | 0.1 | 0.2 | | | | |
| | *Poa secunda* | 21 | 5.4 | 0.4 | 0.5 | 3.0 | | | | |
| | *Eriogonum inflatum* | 21 | 1.9 | 0.1 | 0.2 | 0.5 | | | | |
| | *Eriastrum* | 21 | 0.9 | 0.0 | 0.1 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 32 | 19.8 | 0.3 | 0.2 | 5.0 | | | | |
| | Cryptogammic crust | 25 | 15.4 | 0.2 | 0.2 | 1.5 | | | | |

## *Coleogyne ramosissima – Eriogonum fasciculatum* Association

**Common Name:** Blackbush – California Buckwheat Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1407 m, Range 1040 – 1782 m
Slope: Mean 12°, Range 0 – 25°
Aspect: Variable

Tree Cover: Mean 0.2%, Range 0 – 0.4%
Shrub Cover: Mean 17.7%, Range 6 – 40%
Herb Cover: Mean 10.0%, Range 2 – 35%

**Surface Covers:**
Large Rock: Mean 6.8%, Range 0.0 –30%
Small Rock: Mean 61.2%, Range 25 – 94%
Fines: Mean 22.5%, Range 3 – 41%
Litter: Mean 1.6%, Range 0 – 5%

**Surveys Used in Description (N = 10):** DEVA9148, DEVA9261, DEVA9354, DEVAD123, JAWB0100, JAWB0110, MOJC0963, MOJC0465, SLTN0248, SLTN0867

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Yucca brevifolia* | 27 | 19.7 | 0.1 | 0.2 | 0.2 | | | | |
| **Shrub** | | | | | | | | | |
| *Coleogyne ramosissima* | 100 | 41.8 | 8.5 | 3.0 | 25.0 | X | | X | X |
| *Eriogonum fasciculatum* | 100 | 12.5 | 2.5 | 0.5 | 8.0 | X | | | X |
| *Ephedra nevadensis* | 73 | 4.5 | 0.8 | 0.2 | 2.0 | | | | X |
| *Ericameria teretifolia* | 55 | 2.9 | 0.7 | 0.1 | 3.0 | | | | X |
| *Salazaria mexicana* | 45 | 5.0 | 1.0 | 0.2 | 4.0 | | | | |
| *Hymenoclea salsola* | 45 | 4.5 | 0.7 | 0.2 | 4.0 | | | | |
| *Lepidium fremontii* | 45 | 0.7 | 0.1 | 0.1 | 0.5 | | | | |
| *Krascheninnikovia lanata* | 45 | 0.6 | 0.1 | 0.1 | 0.2 | | | | |
| *Grayia spinosa* | 36 | 1.1 | 0.2 | 0.2 | 1.5 | | | | |
| *Ericameria cooperi* | 27 | 3.3 | 0.6 | 1.0 | 4.0 | | | | |
| *Tetradymia stenolepis* | 27 | 2.3 | 0.4 | 0.2 | 3.0 | | | | |
| *Psorothamnus arborescens* | 27 | 2.0 | 0.4 | 1.0 | 2.0 | | | | |
| *Ericameria linearifolia* | 27 | 1.7 | 0.3 | 0.2 | 2.0 | | | | |
| *Thamnosma montana* | 27 | 1.4 | 0.2 | 0.2 | 2.0 | | | | |
| *Stephanomeria pauciflora* | 27 | 0.7 | 0.1 | 0.2 | 1.0 | | | | |
| *Encelia actonii* | 27 | 0.7 | 0.1 | 0.1 | 1.0 | | | | |
| **Herb** | | | | | | | | | |
| *Bromus rubens* | 100 | 37.5 | 4.2 | 0.1 | 35.0 | X | | X | X |
| *Achnatherum speciosum* | 64 | 14.0 | 0.5 | 0.2 | 3.0 | | | | X |
| *Sphaeralcea ambigua* | 45 | 4.5 | 0.1 | 0.1 | 0.5 | | | | |
| *Amsinckia* | 36 | 2.7 | 0.2 | 0.2 | 2.0 | | | | |
| *Poa secunda* | 27 | 2.1 | 0.1 | 0.1 | 1.0 | | | | |
| *Salvia columbariae* | 27 | 1.2 | 0.0 | 0.1 | 0.2 | | | | |

## *Cornus sericea – Rosa woodsii – Ribes* spp. Shrubland Alliance

**Common Name:** Interior rose thickets

**NVC Alliance Code:** A3773. *Cornus sericea - Dasiphora fruticosa* ssp. *floribunda - Ribes* spp. Wet Shrubland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Rosa woodsii* | 2 | CEGL001126 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1596 m, Range 1168 – 2024 m
Slope: Mean 3°, Range 0 – 6°
Aspect: Southeast-facing

Tree Cover: Mean 5.0%, Range 0 – 10%
Shrub Cover: Mean 73.5%, Range 67 – 80%
Herb Cover: Mean 15.5%, Range 9 – 22%

**Surface Covers:**
Large Rock: Mean 0.5%, Range 0.0 –1%
Small Rock: 0.0%
Fines: Mean 56.0%, Range 25 – 87%
Litter: Mean 35.0%, Range 0 – 70%

**Conservation Status Rank: Global** G5; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | **1** | | | | | **1** |

**Surveys Used in Description (N = 2):** OWVA0030, SLTN1102

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Salix* | 50 | 25.0 | 2.5 | 5.0 | 5.0 | | | | **x** |
| | *Pinus monophylla* | 50 | 25.0 | 2.5 | 5.0 | 5.0 | | | | **x** |
| **Shrub** | | | | | | | | | | |
| | *Rosa woodsii* | 100 | 76.4 | 58.5 | 37.0 | 80.0 | **x** | **x** | | **x** |
| | *Ericameria nauseosa* | 50 | 22.4 | 15.0 | 30.0 | 30.0 | | | | **x** |
| | *Clematis ligusticifolia* | 50 | 1.2 | 1.0 | 2.0 | 2.0 | | | | **x** |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Distichlis spicata* | 100 | 1.4 | 0.2 | 0.1 | 0.2 | **x** | | | **x** |
| | *Eleocharis* | 50 | 47.6 | 5.0 | 10.0 | 10.0 | | | | **x** |
| | *Sporobolus airoides* | 50 | 19.2 | 2.0 | 4.0 | 4.0 | | | | **x** |
| | *Leymus triticoides* | 50 | 19.2 | 2.0 | 4.0 | 4.0 | | | | **x** |
| | *Juncus mexicanus* | 50 | 4.8 | 0.5 | 1.0 | 1.0 | | | | **x** |
| | *Chenopodium* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Glycyrrhiza lepidota* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Xanthium strumarium* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Carex* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Poa* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Descurainia sophia* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Aquilegia* | 50 | 0.5 | 0.1 | 0.1 | 0.1 | | | | **x** |
| | *Juncus* | 50 | 0.5 | 0.1 | 0.1 | 0.1 | | | | **x** |
| | *Cirsium* | 50 | 0.5 | 0.1 | 0.1 | 0.1 | | | | **x** |
| | *Solidago* | 50 | 0.5 | 0.1 | 0.1 | 0.1 | | | | **x** |
| **Non-vasc** | | | | | | | | | | |
| | Moss | 50 | 50.0 | 0.1 | 0.1 | 0.1 | | | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = 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* | 15 | CEGL005748 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1141 m, Range 609 – 1621 m
Slope: Mean 13°, Range 0 – 37°
Aspect: Variable

Tree Cover: 0.0%
Shrub Cover: Mean 13.3%, Range 1 – 40%
Herb Cover: Mean 4.8%, Range 0 – 21%

**Surface Covers:**
Large Rock: Mean 22.4%, Range 0.0 –65%
Small Rock: Mean 58.1%, Range 0 – 96%
Fines: Mean 9.0%, Range 0 – 75%
Litter: Mean 2.2%, Range 0 – 12%

**Conservation Status Rank: Global** G3; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **2** | | | | **5** | | | | **8** |

**Surveys Used in Description (N = 15):** D07101053, DEVA0137, DEVA0306, DEVA9204, DEVA9252, DEVA9303, DEVA9463, DEVAS165, JAWB0200, MOJC0372, MOJC0468, MOJC0469, MOJC0641, SLTN0626, SLTN0777

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Encelia actonii* | 100 | 40.6 | 6.4 | 1.5 | 20.0 | **x** | | **x** | **x** |
| | *Hymenoclea salsola* | 56 | 4.0 | 0.5 | 0.2 | 2.0 | | | | **x** |
| | *Larrea tridentata* | 50 | 9.2 | 1.4 | 0.5 | 6.0 | | | | **x** |
| | *Viguiera reticulata* | 44 | 4.7 | 0.6 | 0.1 | 3.0 | | | | |
| | *Stephanomeria pauciflora* | 44 | 2.4 | 0.4 | 0.1 | 4.0 | | | | |
| | *Ambrosia dumosa* | 44 | 3.0 | 0.3 | 0.1 | 2.0 | | | | |
| | *Eriogonum fasciculatum* | 38 | 2.3 | 0.5 | 0.2 | 3.0 | | | | |
| | *Psorothamnus arborescens* | 31 | 2.0 | 0.3 | 0.1 | 4.0 | | | | |
| | *Echinocereus engelmannii* | 31 | 1.1 | 0.1 | 0.2 | 0.5 | | | | |
| | *Salazaria mexicana* | 25 | 2.2 | 0.5 | 0.2 | 4.0 | | | | |
| | *Brickellia longifolia* | 25 | 3.2 | 0.3 | 0.2 | 3.0 | | | | |
| | *Ericameria nauseosa* | 25 | 1.0 | 0.1 | 0.2 | 1.0 | | | | |
| | *Opuntia basilaris* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 63 | 16.1 | 1.7 | 0.1 | 20.0 | | | | **x** |
| | *Eriogonum inflatum* | 63 | 9.8 | 0.3 | 0.1 | 1.0 | | | | **x** |
| | *Sphaeralcea ambigua* | 50 | 7.3 | 0.2 | 0.1 | 1.0 | | | | **x** |
| | *Achnatherum speciosum* | 31 | 3.6 | 0.1 | 0.2 | 1.0 | | | | |
| | *Chorizanthe brevicornu* | 31 | 2.2 | 0.1 | 0.1 | 0.2 | | | | |
| | *Cryptantha* | 31 | 1.9 | 0.1 | 0.1 | 0.2 | | | | |
| | *Eriogonum nidularium* | 25 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Gilia* | 25 | 1.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Amsinckia* | 25 | 1.6 | 0.0 | 0.1 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | *Cryptogammic crust* | 31 | 31.3 | 0.2 | 0.2 | 2.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = 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 / (Elymus elymoides)* | 7 | CEGL001255 |
| *Ephedra nevadensis – Ericameria cooperi* | 16 | CEGL001253 |
| *Ephedra nevadensis* (alliance) | 3 | A4245 |
| *Ericameria cooperi* disturbance | 2 | |
| *Grayia spinosa – Tetradymia (axillaris, glabrata)* | 5 | |
| *Ephedra nevadensis – (Salazaria mexicana – Ambrosia salsola)* | 8 | CEGL005751 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1478 m, Range 829 – 2115 m
Slope: Mean 16°, Range 0 – 40°
Aspect: Variable

Tree Cover: Mean 0.3%, Range 0 – 3%
Shrub Cover: Mean 14.0%, Range 1 – 40%
Herb Cover: Mean 10.6%, Range 0 – 50%

**Surface Covers:**
Large Rock: Mean 16.7%, Range 0.0 –80%
Small Rock: Mean 56.1%, Range 0 – 100%
Fines: Mean 15.8%, Range 0 – 55%
Litter: Mean 1.9%, Range 0 – 15%

**Conservation Status Rank: Global** G5; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **4** | **2** | **4** | **9** | **4** | **6** | | **12** |

**Surveys Used in Description (N = 41):** DEVA9210, DEVA9213, DEVA9229, DEVA9441, DEVA9613, DEVAS039, F1806051014, FIR1211061732, FIR1211061754, FIR1211071309, FIR1211071421, JAWB0109, JAWB0111, JAWB0114, MOJC0599, MOJC0600, MOJC0697, MOJC0698, MOJC0920, MOJC0932, MOJC0987, MOJC0988, MOJC1103, OWVA0006, OWVA0008, OWVA0021, SLTN0243, SLTN0533, SLTN0550, SLTN0556, SLTN0567, SLTN0661, SLTN0736, SLTN0965, SLTN0986, SLTN1076, SLTN1105, SLTN1145, SLTN1211, TEHA0008, TEHA0009

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ephedra nevadensis* | 98 | 30.3 | 5.4 | 0.2 | 37.0 | **x** | | **x** | **x** |
| | *Grayia spinosa* | 71 | 7.5 | 1.1 | 0.1 | 6.0 | | | | **x** |
| | *Eriogonum fasciculatum* | 51 | 4.1 | 0.7 | 0.1 | 3.0 | | | | **x** |
| | *Ericameria cooperi* | 47 | 8.2 | 1.3 | 0.1 | 12.0 | | | | |
| | *Hymenoclea salsola* | 47 | 4.6 | 0.7 | 0.1 | 6.0 | | | | |
| | *Lycium andersonii* | 44 | 2.6 | 0.4 | 0.1 | 3.0 | | | | |
| | *Tetradymia axillaris* | 33 | 4.0 | 0.4 | 0.1 | 5.0 | | | | |
| | *Ericameria teretifolia* | 33 | 2.9 | 0.3 | 0.1 | 3.0 | | | | |
| | *Krascheninnikovia lanata* | 31 | 1.4 | 0.3 | 0.1 | 5.0 | | | | |
| | *Psorothamnus arborescens* | 24 | 1.8 | 0.3 | 0.2 | 3.0 | | | | |
| | *Atriplex confertifolia* | 24 | 1.7 | 0.2 | 0.1 | 2.0 | | | | |
| | *Xylorhiza tortifolia* | 24 | 0.9 | 0.2 | 0.1 | 2.0 | | | | |
| | *Stephanomeria pauciflora* | 22 | 0.8 | 0.1 | 0.1 | 1.0 | | | | |
| | *Salazaria mexicana* | 20 | 2.6 | 0.4 | 0.1 | 6.0 | | | | |
| | *Artemisia tridentata* | 20 | 1.8 | 0.4 | 0.2 | 6.0 | | | | |
| | *Ambrosia dumosa* | 20 | 2.0 | 0.3 | 0.2 | 3.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 71 | 22.3 | 1.9 | 0.1 | 15.0 | | | | **x** |
| | *Achnatherum speciosum* | 67 | 7.8 | 0.6 | 0.1 | 3.0 | | | | **x** |
| | *Sphaeralcea ambigua* | 36 | 1.9 | 0.1 | 0.1 | 1.0 | | | | |
| | *Bromus tectorum* | 31 | 6.8 | 1.2 | 0.1 | 40.0 | | | | |
| | *Amsinckia* | 31 | 3.7 | 0.4 | 0.1 | 5.0 | | | | |
| | *Elymus elymoides* | 31 | 1.7 | 0.2 | 0.1 | 7.0 | | | | |
| | *Eriogonum* | 27 | 2.8 | 0.3 | 0.1 | 7.0 | | | | |
| | *Erodium cicutarium* | 24 | 2.9 | 0.2 | 0.1 | 6.0 | | | | |
| | *Eriogonum inflatum* | 24 | 3.1 | 0.2 | 0.1 | 2.0 | | | | |
| | *Poa secunda* | 22 | 1.7 | 0.1 | 0.1 | 2.0 | | | | |
| | *Cryptantha circumscissa* | 22 | 0.4 | 0.1 | 0.1 | 2.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Ephedra nevadensis – (Salazaria mexicana – Ambrosia salsola)* Association

**Common Name:** Nevada Ephedra – (Bladdersage – Cheesebush) Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1234 m, Range 829 – 1839 m
Slope: Mean 24°, Range 0 – 40°
Aspect: Mostly northwest-facing, but variable

Tree Cover: 0%
Shrub Cover: Mean 10.3%, Range 5 – 17%
Herb Cover: Mean 9.9%, Range 2 – 22%

**Surface Covers:**
Large Rock: Mean 24.6%, Range 1.0 –80%
Small Rock: Mean 57.2%, Range 11 – 100%
Fines: Mean 13.4%, Range 2 – 29%
Litter: Mean 1.8%, Range 0 – 5%

**Surveys Used in Description (N = 8):** DEVA9229, JAWB0109, JAWB0111, JAWB0114, MOJC0698, SLTN0533, TEHA0008, TEHA0009

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ephedra nevadensis* | 100 | 30.3 | 3.0 | 0.2 | 6.0 | X | | X | X |
| | *Ericameria teretifolia* | 60 | 6.8 | 0.6 | 0.2 | 2.0 | | | | X |
| | *Eriogonum fasciculatum* | 60 | 4.3 | 0.6 | 0.2 | 2.0 | | | | X |
| | *Hymenoclea salsola* | 60 | 4.1 | 0.4 | 0.2 | 1.0 | | | | X |
| | *Salazaria mexicana* | 50 | 9.0 | 1.5 | 0.2 | 6.0 | | | | X |
| | *Stephanomeria pauciflora* | 50 | 1.5 | 0.2 | 0.2 | 1.0 | | | | X |
| | *Grayia spinosa* | 40 | 2.6 | 0.4 | 0.2 | 2.5 | | | | |
| | *Xylorhiza tortifolia* | 40 | 2.4 | 0.4 | 0.2 | 2.0 | | | | |
| | *Hesperoyucca whipplei* | 40 | 2.8 | 0.2 | 0.2 | 1.0 | | | | |
| | *Lepidium fremontii* | 40 | 1.4 | 0.2 | 0.2 | 1.0 | | | | |
| | *Encelia actonii* | 30 | 8.6 | 1.0 | 3.0 | 4.0 | | | | |
| | *Lycium andersonii* | 30 | 3.1 | 0.4 | 0.2 | 3.0 | | | | |
| | *Coleogyne ramosissima* | 30 | 1.9 | 0.3 | 0.2 | 2.0 | | | | |
| | *Tetradymia axillaris* | 20 | 4.6 | 0.6 | 1.0 | 5.0 | | | | |
| | *Ericameria laricifolia* | 20 | 3.1 | 0.5 | 0.2 | 5.0 | | | | |
| | *Ephedra viridis* | 20 | 2.8 | 0.4 | 1.0 | 3.0 | | | | |
| | *Psorothamnus arborescens* | 20 | 2.1 | 0.3 | 0.2 | 3.0 | | | | |
| | *Ambrosia dumosa* | 20 | 0.9 | 0.2 | 0.5 | 1.0 | | | | |
| | *Picrothamnus desertorum* | 20 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| | *Viguiera reticulata* | 20 | 0.3 | 0.0 | 0.2 | 0.2 | | | | |
| | *Thamnosma montana* | 20 | 0.3 | 0.0 | 0.2 | 0.2 | | | | |

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | |
| *Bromus rubens* | 90 | 32.5 | 3.5 | 0.2 | 12.0 | X | | X | X |
| *Achnatherum speciosum* | 90 | 7.4 | 0.6 | 0.2 | 1.0 | X | | | X |
| *Eriogonum nudum* | 50 | 6.8 | 0.4 | 0.2 | 1.0 | | | | X |
| *Poa secunda* | 50 | 5.5 | 0.4 | 0.2 | 2.0 | | | | X |
| *Amsinckia* | 40 | 6.8 | 0.9 | 1.0 | 5.0 | | | | |
| *Eriogonum inflatum* | 40 | 3.6 | 0.3 | 0.2 | 2.0 | | | | |
| *Erodium cicutarium* | 40 | 1.8 | 0.2 | 0.2 | 1.0 | | | | |
| *Sphaeralcea ambigua* | 40 | 2.1 | 0.1 | 0.2 | 0.5 | | | | |
| *Cryptantha* | 40 | 1.9 | 0.1 | 0.1 | 0.5 | | | | |
| *Salvia columbariae* | 30 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| *Elymus elymoides* | 30 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| *Achnatherum hymenoides* | 30 | 0.5 | 0.1 | 0.1 | 0.2 | | | | |
| *Delphinium* | 30 | 0.5 | 0.1 | 0.1 | 0.2 | | | | |
| *Coreopsis bigelovii* | 20 | 0.9 | 0.1 | 0.2 | 1.0 | | | | |
| *Castilleja angustifolia* | 20 | 1.5 | 0.1 | 0.1 | 0.5 | | | | |
| *Eriogonum nidularium* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| *Cryptantha utahensis* | 20 | 0.7 | 0.0 | 0.2 | 0.2 | | | | |
| *Camissonia boothii* | 20 | 0.9 | 0.0 | 0.2 | 0.2 | | | | |
| *Phacelia fremontii* | 20 | 0.3 | 0.0 | 0.1 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | |
| Lichen | 40 | 39.5 | 0.6 | 0.2 | 4.0 | | | | |

## *Ephedra nevadensis / (Elymus elymoides)* Provisional Association

**Common Name:** Nevada Ephedra – Big Sagebrush / (Squirreltail) Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1874 m, Range 1430 – 2115 m
Slope: Mean 14°, Range 3 – 26°
Aspect: Variable

Tree Cover: Mean 0.4%, Range 0 – 3%
Shrub Cover: Mean 25.6%, Range 5 – 40%
Herb Cover: Mean 24.5%, Range 2 – 50%

**Surface Covers:**
Large Rock: Mean 15.0%, Range 0.0 –75%
Small Rock: Mean 38.8%, Range 0 – 60%
Fines: Mean 13.1%, Range 0 – 25%
Litter: Mean 1.2%, Range 0 – 7%

**Surveys Used in Description (N = 7):** MOJC0932, SLTN0243, SLTN0661, SLTN0986, SLTN1076, SLTN1105, SLTN1211

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | |
| *Ephedra nevadensis* | 100 | 60.5 | 17.3 | 3.0 | 37.0 | X | X | | X |
| *Artemisia tridentata* | 88 | 8.7 | 1.8 | 0.5 | 6.0 | X | | | X |
| *Grayia spinosa* | 63 | 7.1 | 1.9 | 0.5 | 6.0 | | | | X |
| *Chrysothamnus viscidiflorus* | 38 | 2.7 | 0.8 | 1.0 | 3.0 | | | | |
| *Atriplex canescens* | 38 | 1.9 | 0.4 | 0.1 | 3.0 | | | | |
| *Eriogonum fasciculatum* | 38 | 0.8 | 0.1 | 0.1 | 0.5 | | | | |
| *Purshia glandulosa* | 25 | 2.1 | 0.6 | 2.0 | 3.0 | | | | |
| *Purshia tridentata* | 25 | 1.7 | 0.4 | 0.5 | 3.0 | | | | |
| *Picrothamnus desertorum* | 25 | 1.3 | 0.3 | 0.5 | 2.0 | | | | |
| *Tetradymia axillaris* | 25 | 0.9 | 0.3 | 1.0 | 1.0 | | | | |
| *Opuntia basilaris* | 25 | 0.8 | 0.1 | 0.1 | 0.5 | | | | |
| *Ephedra viridis* | 25 | 0.5 | 0.1 | 0.1 | 0.5 | | | | |
| *Cylindropuntia echinocarpa* | 25 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Eriogonum* | 75 | 9.5 | 1.4 | 0.1 | 7.0 | X | | | X |
| *Elymus elymoides* | 75 | 6.4 | 1.0 | 0.1 | 7.0 | X | | | X |
| *Bromus tectorum* | 63 | 14.4 | 5.8 | 1.0 | 40.0 | | | | X |
| *Achnatherum speciosum* | 63 | 5.2 | 0.8 | 0.1 | 3.0 | | | | X |
| *Cryptantha circumscissa* | 63 | 0.9 | 0.3 | 0.1 | 2.0 | | | | X |
| *Sphaeralcea ambigua* | 63 | 2.4 | 0.2 | 0.1 | 1.0 | | | | X |
| *Layia glandulosa* | 50 | 1.9 | 0.3 | 0.1 | 1.0 | | | | X |
| *Bromus rubens* | 50 | 6.9 | 0.2 | 0.1 | 1.0 | | | | X |
| *Pleuraphis jamesii* | 38 | 13.9 | 3.9 | 0.5 | 30.0 | | | | |
| *Eriophyllum* | 38 | 3.6 | 1.3 | 0.1 | 10.0 | | | | |
| *Mentzelia albicaulis* | 38 | 2.6 | 0.8 | 0.1 | 5.0 | | | | |
| *Chaenactis stevioides* | 38 | 1.8 | 0.2 | 0.1 | 1.0 | | | | |
| *Amsinckia* | 38 | 0.3 | 0.0 | 0.1 | 0.1 | | | | |
| *Cryptantha pterocarya* | 38 | 0.2 | 0.0 | 0.1 | 0.1 | | | | |
| *Phacelia* | 25 | 0.9 | 0.1 | 0.1 | 1.0 | | | | |
| *Descurainia californica* | 25 | 0.4 | 0.1 | 0.1 | 1.0 | | | | |
| *Achnatherum hymenoides* | 25 | 0.2 | 0.0 | 0.1 | 0.1 | | | | |

## *Ephedra nevadensis – Ericameria cooperi* Association

**Common Name:** Nevada Ephedra – Cooper's Goldenbush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1560 m, Range 1136 – 1873 m
Slope: Mean 11°, Range 0 – 28°
Aspect: Variable

Tree Cover: Mean 0.5%, Range 0 – 2%
Shrub Cover: Mean 11.2%, Range 1 – 20%
Herb Cover: Mean 5.7%, Range 0 – 12%

**Surface Covers:**
Large Rock: Mean 13.1%, Range 0.0 –59%
Small Rock: Mean 65.5%, Range 25 – 98%
Fines: Mean 15.9%, Range 1 – 43%
Litter: Mean 2.3%, Range 0 – 15%

**Surveys Used in Description (N = 18):** DEVA9210, DEVA9213, DEVA9441, DEVA9613, DEVAS039, MOJC0599, MOJC0600, MOJC0697, MOJC0987, MOJC0988, OWVA0021, SLTN0556, SLTN0567, SLTN0736, SLTN0965, SLTN1145

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Yucca brevifolia* | 29 | 29.4 | 0.3 | 0.2 | 2.0 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Ephedra nevadensis* | 100 | 27.3 | 3.7 | 1.0 | 9.0 | X | | | X |
| | *Lycium andersonii* | 88 | 5.0 | 0.8 | 0.1 | 3.0 | X | | | X |
| | *Ericameria cooperi* | 82 | 15.2 | 2.2 | 0.2 | 8.0 | X | | | X |
| | *Grayia spinosa* | 76 | 6.8 | 0.9 | 0.1 | 3.0 | X | | | X |
| | *Eriogonum fasciculatum* | 65 | 6.4 | 1.1 | 1.0 | 3.0 | | | | X |
| | *Hymenoclea salsola* | 59 | 5.1 | 0.8 | 0.1 | 4.0 | | | | X |
| | *Krascheninnikovia lanata* | 47 | 1.4 | 0.2 | 0.1 | 1.0 | | | | |
| | *Psorothamnus arborescens* | 41 | 2.0 | 0.2 | 0.2 | 1.0 | | | | |
| | *Xylorhiza tortifolia* | 35 | 0.8 | 0.1 | 0.1 | 1.0 | | | | |
| | *Tetradymia axillaris* | 35 | 0.7 | 0.1 | 0.1 | 1.0 | | | | |
| | *Ericameria laricifolia* | 29 | 3.7 | 0.5 | 0.2 | 6.0 | | | | |
| | *Atriplex confertifolia* | 29 | 2.0 | 0.3 | 0.1 | 2.0 | | | | |
| | *Ambrosia dumosa* | 24 | 2.3 | 0.4 | 0.2 | 3.0 | | | | |
| | *Ericameria teretifolia* | 24 | 1.8 | 0.3 | 0.1 | 3.0 | | | | |
| | *Coleogyne ramosissima* | 24 | 1.1 | 0.1 | 0.1 | 1.0 | | | | |
| | *Opuntia basilaris* | 24 | 0.4 | 0.1 | 0.1 | 0.5 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Achnatherum speciosum* | 76 | 11.3 | 0.7 | 0.1 | 3.0 | X | | | X |
| | *Bromus rubens* | 65 | 15.9 | 1.6 | 0.1 | 13.0 | | | | X |
| | *Sphaeralcea ambigua* | 41 | 2.5 | 0.1 | 0.1 | 0.5 | | | | |
| | *Bromus tectorum* | 29 | 2.1 | 0.1 | 0.1 | 1.0 | | | | |
| | *Chaenactis* | 29 | 2.3 | 0.1 | 0.1 | 1.0 | | | | |
| | *Elymus elymoides* | 29 | 1.0 | 0.1 | 0.1 | 0.5 | | | | |
| | *Erodium cicutarium* | 24 | 5.0 | 0.4 | 0.1 | 6.0 | | | | |
| | *Amsinckia* | 24 | 3.8 | 0.3 | 0.2 | 2.0 | | | | |
| | *Eriogonum inflatum* | 24 | 4.6 | 0.2 | 0.2 | 2.0 | | | | |
| | *Phacelia fremontii* | 24 | 3.4 | 0.1 | 0.1 | 1.0 | | | | |
| | *Mirabilis laevis* | 24 | 1.6 | 0.1 | 0.1 | 0.5 | | | | |

## *Ericameria cooperi* disturbance Provisional Association

**Common Name:** Cooper's Goldenbush disturbance Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1339 m, Range 1216 – 1461 m
Slope: 4°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 29.0%, Range 25 – 33%
Herb Cover: Mean 21.1%, Range 17 – 25%

**Surface Covers:**
Large Rock: Mean 0.1%, Range 0.0 –0.2%
Small Rock: Mean 57.5%, Range 30 – 85%
Fines: Mean 10.0%, Range 9 – 11%
Litter: Mean 0.6%, Range 0 – 1%

**Surveys Used in Description (N = 2):** OWVA0006, SLTN0550

**Association Stand Table:**

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | |
| *Ericameria cooperi* | 100 | 30.5 | 9.0 | 6.0 | 12.0 | X | | X | X |
| *Tetradymia stenolepis* | 100 | 13.2 | 4.0 | 2.0 | 6.0 | X | | | X |
| *Krascheninnikovia lanata* | 100 | 11.7 | 3.5 | 2.0 | 5.0 | X | | | X |
| *Grayia spinosa* | 100 | 9.2 | 2.5 | 2.0 | 3.0 | X | | | X |
| *Hymenoclea salsola* | 100 | 7.2 | 2.0 | 2.0 | 2.0 | X | | | X |
| *Ephedra nevadensis* | 100 | 2.4 | 0.6 | 0.2 | 1.0 | X | | | X |
| *Lycium cooperi* | 50 | 6.2 | 1.5 | 3.0 | 3.0 | | | | X |
| *Psorothamnus arborescens* | 50 | 4.5 | 1.5 | 3.0 | 3.0 | | | | X |
| *Ambrosia dumosa* | 50 | 4.1 | 1.0 | 2.0 | 2.0 | | | | X |
| *Atriplex polycarpa* | 50 | 4.1 | 1.0 | 2.0 | 2.0 | | | | X |
| *Eriogonum fasciculatum* | 50 | 3.0 | 1.0 | 2.0 | 2.0 | | | | X |
| *Acamptopappus* | 50 | 2.1 | 0.5 | 1.0 | 1.0 | | | | X |
| *Ericameria laricifolia* | 50 | 1.5 | 0.5 | 1.0 | 1.0 | | | | X |
| *Picrothamnus desertorum* | 50 | 0.2 | 0.1 | 0.1 | 0.1 | | | | X |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Mentzelia albicaulis* | 100 | 20.0 | 3.5 | 2.0 | 5.0 | X | | | X |
| | *Amsinckia* | 100 | 5.8 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Chorizanthe brevicornu* | 50 | 13.9 | 2.5 | 5.0 | 5.0 | | | | X |
| | *Bromus madritensis* | 50 | 13.9 | 2.5 | 5.0 | 5.0 | | | | X |
| | *Phacelia* | 50 | 9.2 | 1.5 | 3.0 | 3.0 | | | | X |
| | *Chaenactis carphoclinia* | 50 | 9.2 | 1.5 | 3.0 | 3.0 | | | | X |
| | *Uropappus lindleyi* | 50 | 6.1 | 1.0 | 2.0 | 2.0 | | | | X |
| | *Phacelia fremontii* | 50 | 6.1 | 1.0 | 2.0 | 2.0 | | | | X |
| | *Eriophyllum* | 50 | 3.1 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Cryptantha pterocarya* | 50 | 3.1 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Logfia depressa* | 50 | 2.8 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Pectocarya setosa* | 50 | 0.6 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Erodium cicutarium* | 50 | 0.6 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Cryptantha nevadensis* | 50 | 0.6 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Bromus tectorum* | 50 | 0.6 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Mirabilis laevis* | 50 | 0.6 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Camissonia claviformis* | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Lupinus* | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Gilia* | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Bromus rubens* | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | unknown Polemoniaceae | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Achnatherum hymenoides* | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Arabis lemmonii* | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Centrostegia thurberi* | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Cryptantha circumscissa* | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Eriogonum* | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Eriogonum pusillum* | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Camissonia* | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Stephanomeria exigua* | 50 | 0.3 | 0.1 | 0.1 | 0.1 | | | | X |

## *Grayia spinosa – Tetradymia (axillaris, glabrata)* Provisional Association

**Common Name:** Hop-sage – Horsebrush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1304 m, Range 1270 – 1343 m
Slope: no data
Aspect: no data

Tree Cover: 0%
Shrub Cover: Mean 8.8%, Range 3 – 18%
Herb Cover: 3%

**Surface Covers:**
Large Rock: 0.2%
Small Rock: 36%
Fines: 55%
Litter: 9%

**Surveys Used in Description (N = 5):** FIR1211061732, FIR1211061754, FIR1211071309, FIR1211071421, OWVA0008

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Standing snag* | 20 | 20.0 | 0.0 | 0.2 | 0.2 | | | | |
| **Shrub** | | | | | | | | | |
| *Grayia spinosa* | 100 | 22.7 | 1.8 | 1.0 | 4.0 | X | | | X |
| *Tetradymia axillaris* | 100 | 23.2 | 1.4 | 1.0 | 2.0 | X | | | X |
| *Ephedra nevadensis* | 100 | 11.6 | 0.9 | 0.2 | 2.0 | X | | | X |
| *Tetradymia glabrata* | 80 | 9.8 | 0.5 | 0.2 | 1.0 | X | | | X |
| *Ericameria cooperi* | 60 | 9.3 | 0.6 | 0.2 | 2.0 | | | | X |
| *Atriplex confertifolia* | 60 | 5.7 | 0.3 | 0.2 | 1.0 | | | | X |
| *Ericameria teretifolia* | 60 | 3.9 | 0.3 | 0.2 | 1.0 | | | | X |
| *Krascheninnikovia lanata* | 40 | 1.9 | 0.2 | 0.2 | 1.0 | | | | |
| *Hymenoclea salsola* | 20 | 6.6 | 1.2 | 6.0 | 6.0 | | | | |
| *Psorothamnus arborescens* | 20 | 3.3 | 0.6 | 3.0 | 3.0 | | | | |
| *Psorothamnus polydenius* | 20 | 1.1 | 0.2 | 1.0 | 1.0 | | | | |
| *Ericameria* | 20 | 0.2 | 0.0 | 0.2 | 0.2 | | | | |
| *Menodora spinescens* | 20 | 0.8 | 0.0 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | |
| *Bromus rubens* | 80 | 45.7 | 0.9 | 0.2 | 2.0 | X | | X | X |
| *Bromus tectorum* | 40 | 30.0 | 0.8 | 2.0 | 2.0 | | | | |
| *Bromus madritensis* | 20 | 6.7 | 0.2 | 1.0 | 1.0 | | | | |
| *Achnatherum speciosum* | 20 | 1.7 | 0.0 | 0.2 | 0.2 | | | | |
| *Gilia* | 20 | 4.0 | 0.0 | 0.2 | 0.2 | | | | |
| *Navarretia* | 20 | 4.0 | 0.0 | 0.2 | 0.2 | | | | |
| *Amsinckia* | 20 | 4.0 | 0.0 | 0.2 | 0.2 | | | | |
| *Eriogonum* | 20 | 4.0 | 0.0 | 0.2 | 0.2 | | | | |

## *Ephedra viridis* Shrubland Alliance

**Common Name:** Mormon tea scrub

**NVC Alliance Code:** A3201. *Ephedra viridis* Colorado Plateau Shrubland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Ephedra viridis* | 6 | CEPP006703 |
| *Ephedra viridis* (alliance) | 1 | A3201 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1562 m, Range 1211 – 2151 m
Slope: Mean 31°, Range 22 – 38°
Aspect: Variable

Tree Cover: 0.0%
Shrub Cover: Mean 12.5%, Range 3 – 25%
Herb Cover: Mean 7.0%, Range 0 – 26%

**Surface Covers:**
Large Rock: Mean 30.1%, Range 1.0 –83%
Small Rock: Mean 44.8%, Range 14 – 86%
Fines: Mean 9.0%, Range 0 – 27%
Litter: Mean 4.0%, Range 0 – 17%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **1** | **2** | | **2** | | | | **2** |

**Surveys Used in Description (N = 7):** DEVA9379, DEVA9650, DEVA9656, DEVAS197, JAWB0033, SLTN0984, TEHA0117

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ephedra viridis* | 100 | 45.6 | 7.0 | 1.0 | 20.0 | x | | x | x |
| | *Grayia spinosa* | 33 | 5.4 | 0.9 | 0.5 | 5.0 | | | | |
| | *Hesperoyucca whipplei* | 33 | 2.8 | 0.5 | 1.0 | 2.0 | | | | |
| | *Ericameria linearifolia* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Quercus john-tuckeri* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Atriplex confertifolia* | 33 | 0.9 | 0.1 | 0.1 | 0.2 | | | | |
| | *Ericameria nauseosa* | 33 | 0.9 | 0.1 | 0.1 | 0.2 | | | | |
| | *Encelia actonii* | 33 | 0.7 | 0.0 | 0.1 | 0.1 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Achnatherum speciosum* | 83 | 23.3 | 0.9 | 0.2 | 3.0 | **x** | | | **x** |
| | *Erodium cicutarium* | 50 | 6.5 | 0.2 | 0.1 | 1.0 | | | | **x** |
| | *Salvia columbariae* | 33 | 2.6 | 0.4 | 0.2 | 2.0 | | | | |
| | *Bromus rubens* | 33 | 11.3 | 0.3 | 1.0 | 1.0 | | | | |
| | *Elymus elymoides* | 33 | 17.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus tectorum* | 33 | 1.1 | 0.1 | 0.1 | 0.2 | | | | |
| | *Eriogonum* | 33 | 1.4 | 0.0 | 0.1 | 0.1 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 50 | 49.9 | 10.2 | 0.2 | 60.0 | | | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Ephedra viridis* Association

**Common Name:** Green Ephedra Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1589 m, Range 1211 – 2151 m
Slope: Mean 30°, Range 22 – 38°
Aspect: Variable

Tree Cover: Mean 0.1%, Range 0 – 0.2%
Shrub Cover: Mean 12.0%, Range 3 – 25%
Herb Cover: Mean 8.0%, Range 0 – 26%

**Surface Covers:**
Large Rock: Mean 33.2%, Range 1.0 –83%
Small Rock: Mean 45.9%, Range 14 – 86%
Fines: Mean 5.4%, Range 0 – 15%
Litter: Mean 1.4%, Range 0 – 3%

**Surveys Used in Description (N = 6):** DEVA9379, DEVA9650, DEVA9656, DEVAS197, JAWB0033, SLTN0984

**Association Stand Table:**

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Yucca brevifolia* | 20 | 20.0 | 0.0 | 0.2 | 0.2 | | | | |
| **Shrub** | | | | | | | | | |
| *Ephedra viridis* | 100 | 46.1 | 6.8 | 1.0 | 20.0 | X | | X | X |
| *Ericameria nauseosa* | 40 | 1.1 | 0.1 | 0.1 | 0.2 | | | | |
| *Atriplex confertifolia* | 40 | 1.1 | 0.1 | 0.1 | 0.2 | | | | |
| *Encelia actonii* | 40 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |
| *Brickellia nevinii* | 20 | 11.4 | 2.0 | 10.0 | 10.0 | | | | |
| *Eriogonum heermannii* | 20 | 7.3 | 0.8 | 4.0 | 4.0 | | | | |
| *Artemisia ludoviciana* | 20 | 6.0 | 0.6 | 3.0 | 3.0 | | | | |
| *Stephanomeria pauciflora* | 20 | 2.3 | 0.4 | 2.0 | 2.0 | | | | |
| *Purshia glandulosa* | 20 | 1.7 | 0.4 | 2.0 | 2.0 | | | | |
| *Hesperoyucca whipplei* | 20 | 2.3 | 0.4 | 2.0 | 2.0 | | | | |
| *Prunus fasciculata* | 20 | 2.8 | 0.3 | 1.5 | 1.5 | | | | |
| *Frangula californica* | 20 | 0.9 | 0.2 | 1.0 | 1.0 | | | | |
| *Ambrosia dumosa* | 20 | 6.3 | 0.2 | 1.0 | 1.0 | | | | |
| *Thamnosma montana* | 20 | 3.2 | 0.1 | 0.5 | 0.5 | | | | |
| *Grayia spinosa* | 20 | 1.0 | 0.1 | 0.5 | 0.5 | | | | |
| *Lycium andersonii* | 20 | 1.0 | 0.1 | 0.5 | 0.5 | | | | |
| *Brickellia* | 20 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| *Ericameria linearifolia* | 20 | 0.2 | 0.0 | 0.2 | 0.2 | | | | |
| *Atriplex canescens* | 20 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| *Tetradymia axillaris* | 20 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| *Gutierrezia sarothrae* | 20 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| *Hymenoclea salsola* | 20 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| *Quercus john-tuckeri* | 20 | 0.2 | 0.0 | 0.2 | 0.2 | | | | |
| *Keckiella breviflora* | 20 | 0.2 | 0.0 | 0.2 | 0.2 | | | | |
| *Xylorhiza tortifolia* | 20 | 0.7 | 0.0 | 0.1 | 0.1 | | | | |
| *Opuntia basilaris* | 20 | 0.7 | 0.0 | 0.1 | 0.1 | | | | |

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Shrub ctnd.** | | | | | | | | | |
| *Brickellia microphylla* | 20 | 0.7 | 0.0 | 0.1 | 0.1 | | | | |
| *Stephanomeria* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| unknown Asteraceae | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| **Herb** | | | | | | | | | |
| *Achnatherum speciosum* | 80 | 26.5 | 1.0 | 0.2 | 3.0 | X | | | X |
| *Elymus elymoides* | 40 | 21.3 | 0.1 | 0.2 | 0.2 | | | | |
| *Bromus tectorum* | 40 | 1.4 | 0.1 | 0.1 | 0.2 | | | | |
| *Erodium cicutarium* | 40 | 0.7 | 0.1 | 0.1 | 0.2 | | | | |
| *Eriogonum* | 40 | 1.7 | 0.0 | 0.1 | 0.1 | | | | |
| *Camissonia claviformis* | 20 | 10.9 | 2.6 | 13.0 | 13.0 | | | | |
| *Chaenactis xantiana* | 20 | 2.5 | 0.6 | 3.0 | 3.0 | | | | |
| *Salvia columbariae* | 20 | 1.7 | 0.4 | 2.0 | 2.0 | | | | |
| *Lotus strigosus* | 20 | 0.8 | 0.2 | 1.0 | 1.0 | | | | |
| *Mentzelia albicaulis* | 20 | 0.8 | 0.2 | 1.0 | 1.0 | | | | |
| *Phacelia* | 20 | 0.8 | 0.2 | 1.0 | 1.0 | | | | |
| *Eriogonum saxatile* | 20 | 3.1 | 0.2 | 1.0 | 1.0 | | | | |
| *Melica imperfecta* | 20 | 3.1 | 0.2 | 1.0 | 1.0 | | | | |
| *Eriastrum densifolium* | 20 | 0.8 | 0.2 | 1.0 | 1.0 | | | | |
| *Bromus rubens* | 20 | 6.5 | 0.2 | 1.0 | 1.0 | | | | |
| *Poa* | 20 | 3.2 | 0.1 | 0.5 | 0.5 | | | | |
| *Dudleya calcicola* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| *Phacelia vallis-mortae* | 20 | 1.3 | 0.0 | 0.2 | 0.2 | | | | |
| *Phacelia imbricata* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| *Galium andrewsii* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| *Gilia* | 20 | 1.3 | 0.0 | 0.2 | 0.2 | | | | |
| *Amsinckia* | 20 | 1.3 | 0.0 | 0.2 | 0.2 | | | | |
| *Corethrogyne filaginifolia* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| *Mentzelia congesta* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| *Cirsium* | 20 | 1.3 | 0.0 | 0.2 | 0.2 | | | | |
| *Avena* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| *Mirabilis* | 20 | 1.3 | 0.0 | 0.2 | 0.2 | | | | |
| *Mentzelia* | 20 | 1.7 | 0.0 | 0.1 | 0.1 | | | | |
| *Chorizanthe brevicornu* | 20 | 1.7 | 0.0 | 0.1 | 0.1 | | | | |
| *Eschscholzia minutiflora* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Cryptantha mohavensis* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Caulanthus pilosus* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Astragalus lentiginosus* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Senecio flaccidus* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Coreopsis bigelovii* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| **Non-vasc** | | | | | | | | | |
| *Lichen* | 60 | 59.9 | 12.2 | 0.2 | 60.0 | | | | X |
| *Moss* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |

## *Ericameria linearifolia – Cleome isomeris* Shrubland Alliance

**Common Name:** Narrowleaf goldenbush – bladderpod scrub

**NVC Alliance Code:** A4101. *Ericameria linearifolia - Cleome isomeris* Scrub Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Ericameria linearifolia* | 2 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1188 m, Range 1033 – 1342 m
Slope: 37°
Aspect: Southeast-facing

Tree Cover: Mean 2.1%, Range 0 – 4%
Shrub Cover: Mean 14.4%, Range 7 – 22%
Herb Cover: Mean 43.5%, Range 15 – 72%

**Surface Covers:**
Large Rock: no data
Small Rock: no data
Fines: no data
Litter: no data

**Conservation Status Rank: Global** G4; **State (California)** S4

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | | **1** | | | | | | |

**Surveys Used in Description (N = 2):** C06021056, ERSKDS26

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | Standing snag | 50 | 50.0 | 2.0 | 4.0 | 4.0 | | | | **x** |
| | *Yucca brevifolia* | 50 | 50.0 | 0.1 | 0.2 | 0.2 | | | | **x** |
| **Shrub** | | | | | | | | | | |
| | *Ericameria linearifolia* | 100 | 83.5 | 12.5 | 5.0 | 20.0 | **x** | **x** | | **x** |
| | *Eriogonum fasciculatum* | 50 | 2.3 | 0.5 | 1.0 | 1.0 | | | | **x** |
| | *Stephanomeria* | 50 | 7.4 | 0.5 | 1.0 | 1.0 | | | | **x** |
| | *Prunus fasciculata* | 50 | 1.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Cylindropuntia echinocarpa* | 50 | 1.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Artemisia tridentata* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Ceanothus greggii* var. *vestitus* | 50 | 1.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Ericameria nauseosa* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *unknown Asteraceae* | 50 | 1.5 | 0.1 | 0.2 | 0.2 | | | | **x** |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Erodium cicutarium* | 100 | 35.9 | 14.7 | 5.0 | 24.4 | **x** | | **x** | **x** |
| | *Bromus tectorum* | 100 | 35.8 | 10.2 | 7.0 | 13.3 | **x** | | **x** | **x** |
| | *Poa secunda* | 100 | 9.3 | 4.5 | 1.0 | 8.0 | **x** | | | **x** |
| | *Lupinus bicolor* | 50 | 4.2 | 3.0 | 6.0 | 6.0 | | | | **x** |
| | *Vulpia* | 50 | 2.8 | 2.0 | 4.0 | 4.0 | | | | **x** |
| | *Eriogonum* | 50 | 2.1 | 1.5 | 3.0 | 3.0 | | | | **x** |
| | *Bromus rubens* | 50 | 2.1 | 1.5 | 3.0 | 3.0 | | | | **x** |
| | *Avena* | 50 | 2.1 | 1.5 | 3.0 | 3.0 | | | | **x** |
| | *Lupinus benthamii* | 50 | 1.4 | 1.0 | 2.0 | 2.0 | | | | **x** |
| | *Bromus diandrus* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Chamaesyce* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Cryptantha mohavensis* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Eschscholzia californica* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Camissonia claviformis* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Gilia clivorum* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Coreopsis bigelovii* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Elymus elymoides* | 50 | 0.8 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Dichelostemma capitatum* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Cryptantha pterocarya* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Claytonia exigua* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Athysanus pusillus* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Descurainia pinnata* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Gilia latiflora* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Amsinckia* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Lotus wrangelianus* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Lasthenia gracilis* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Caulanthus coulteri* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Pectocarya* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Thysanocarpus curvipes* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Plagiobothrys nothofulvus* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Plagiobothrys arizonicus* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Pectocarya penicillata* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Salvia columbariae* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *unknown Themidaceae* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Linanthus dichotomus* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Arabis pulchra* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Ericameria nauseosa* Shrubland Alliance

**Common Name:** Rubber rabbitbrush scrub

**NVC Alliance Code:** A3196. *Ericameria nauseosa* Steppe & Shrubland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Ericameria nauseosa* | 21 | CEGL002713 |
| *Ericameria nauseosa – Atriplex torreyi* | 13 | |
| *Ericameria nauseosa* (alliance) | 1 | A3196 |
| *Ericameria nauseosa / Bromus tectorum* | 1 | CEGL002937 |
| *Ericameria nauseosa / Sporobolus airoides* | 35 | CEGL002918 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1317 m, Range 816 – 3361 m
Slope: Mean 9°, Range 0 – 42°
Aspect: Variable

Tree Cover: Mean 0.6%, Range 0 – 2%
Shrub Cover: Mean 18.9%, Range 4 – 60%
Herb Cover: Mean 15.4%, Range 0 – 58%

**Surface Covers:**
Large Rock: Mean 13.3%, Range 0.0 –60%
Small Rock: Mean 38.1%, Range 0 – 93%
Fines: Mean 26.8%, Range 1 – 93%
Litter: Mean 7.3%, Range 0 – 52%

**Conservation Status Rank: Global** G5; **State (California)** S5

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | **4** | **2** | **19** | **1** | **1** | **34** | | **8** |

**Surveys Used in Description (N = 71):** BGP091_d, BGP157_a, BGP162_a, BGP205_d, BIS055_d, BIS085_a, BLK008_d, BLK009_a, BLK039_a, BLK059_a, C07130846, D05310624, DEVA0146, DEVA9217, DEVA9328, DEVA9450, DEVA9553, DEVA9637, FISH0070, FSL064_a, FSL065_a, FSL116_a, FSL118_a, FSL158_a, IND011_a, IND019_a, IND021_a, IND064_a, IND066_d, IND087_a, IND096_a, IND122_a, IND163_a, IND163_d, IND205_a, JAWB0044, JAWB0104, JAWB0213, LAW137_d, LAW167_d, LNP019_a, MAN017_d, MAN042_a, MOJC0062, MOJC0631, PLC024_a, PLC055_d, PLC056_a, PLC065_d, PLC072_a, PLC088_a, PLC092_a, PLC106_a, PLC107_a, PLC110_d, PLC111_d, PLC125_d, PLC136_a, PLC137_a, PLC187_d, PLC193_d, PLC220_d, PLC223_a, POA1504011501, SLTN0522, SLTN0725, SLTN0789, SLTN1165, SLTN1196, TIN053_a, ZOE1504130800

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 100 | 55.7 | 11.1 | 1.1 | 55.0 | **x** | **x** | | **x** |
| | *Atriplex torreyi* | 69 | 16.9 | 3.2 | 0.1 | 19.6 | | | | **x** |
| | *Sarcobatus vermiculatus* | 52 | 4.3 | 0.6 | 0.1 | 3.7 | | | | **x** |
| | *Artemisia tridentata* | 49 | 5.6 | 0.9 | 0.1 | 7.3 | | | | |
| | *Atriplex confertifolia* | 42 | 2.3 | 0.3 | 0.1 | 4.0 | | | | |
| | *Salix exigua* | 24 | 1.7 | 0.3 | 0.1 | 4.7 | | | | |
| **Herb** | | | | | | | | | | |
| | *Distichlis spicata* | 68 | 16.3 | 2.9 | 0.1 | 24.8 | | | | **x** |
| | *Sporobolus airoides* | 66 | 24.9 | 4.0 | 0.1 | 23.7 | | | | **x** |
| | *Glycyrrhiza lepidota* | 41 | 4.8 | 0.9 | 0.0 | 10.4 | | | | |
| | *Juncus arcticus* | 41 | 1.3 | 0.3 | 0.0 | 3.6 | | | | |
| | *Salsola* | 38 | 6.6 | 0.6 | 0.1 | 12.8 | | | | |
| | *Leymus cinereus* | 30 | 0.9 | 0.1 | 0.0 | 1.3 | | | | |
| | *Leymus triticoides* | 27 | 2.2 | 0.8 | 0.1 | 12.8 | | | | |
| | *Cordylanthus* | 24 | 1.4 | 0.1 | 0.1 | 1.7 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Ericameria nauseosa* Association

**Common Name:** Rubber Rabbitbrush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1570 m, Range 856 – 3361 m
Slope: Mean 10°, Range 1 – 42°
Aspect: Mostly south-facing

Tree Cover: Mean 0.2%, Range 0 – 1%
Shrub Cover: Mean 20.1%, Range 4 – 60%
Herb Cover: Mean 9.0%, Range 0 – 40%

**Surface Covers:**
Large Rock: Mean 16.2%, Range 0.0 –60%
Small Rock: Mean 45.2%, Range 10 – 93%
Fines: Mean 21.3%, Range 1 – 65%
Litter: Mean 4.7%, Range 0 – 30%

**Surveys Used in Description (N = 21):** D05310624, DEVA0146, DEVA9217, DEVA9328, DEVA9450, DEVA9553, DEVA9637, JAWB0044, JAWB0104, LAW167_d, MOJC0062, MOJC0631, PLC065_d, PLC092_a, PLC193_d, POA1504011501, SLTN0522, SLTN0789, SLTN1165, SLTN1196, ZOE1504130800

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 100 | 63.0 | 13.8 | 2.0 | 55.0 | X | X | | X |
| | *Artemisia tridentata* | 52 | 5.6 | 1.1 | 0.2 | 5.0 | | | | X |
| | *Atriplex confertifolia* | 43 | 3.7 | 0.5 | 0.2 | 4.0 | | | | |
| | *Eriogonum fasciculatum* | 33 | 1.0 | 0.1 | 0.2 | 1.0 | | | | |
| | *Ephedra nevadensis* | 24 | 2.3 | 0.7 | 0.2 | 14.0 | | | | |
| | *Atriplex canescens* | 24 | 1.9 | 0.5 | 0.2 | 6.0 | | | | |
| | *Hymenoclea salsola* | 24 | 0.8 | 0.3 | 0.2 | 5.0 | | | | |
| | *Penstemon fruticiformis* | 24 | 2.3 | 0.3 | 0.2 | 3.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Achnatherum hymenoides* | 43 | 1.8 | 0.1 | 0.1 | 0.5 | | | | |
| | *Bromus rubens* | 38 | 10.7 | 1.9 | 0.2 | 18.0 | | | | |
| | *Bromus tectorum* | 24 | 1.2 | 0.1 | 0.2 | 1.0 | | | | |
| | *Sphaeralcea ambigua* | 24 | 1.1 | 0.1 | 0.2 | 0.5 | | | | |
| | *Elymus elymoides* | 24 | 1.3 | 0.1 | 0.1 | 0.5 | | | | |

## *Ericameria nauseosa – Atriplex torreyi* Provisional Association

**Common Name:** Rubber Rabbitbrush – Torrey's Saltbush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1208 m, Range 1152 – 1273 m
Slope: no data
Aspect: no data

Tree Cover: Mean 1.8%, Range 1 – 2%
Shrub Cover: Mean 19.2%, Range 8 – 36%
Herb Cover: Mean 4.9%, Range 0 – 15%

**Surface Covers:**
Large Rock: no data
Small Rock: no data
Fines: no data
Litter: no data

**Surveys Used in Description (N = 13):** BGP162_a, FSL118_a, IND064_a, IND096_a, IND122_a, LAW137_d, MAN017_d, MAN042_a, PLC055_d, PLC072_a, PLC107_a, PLC111_d, PLC187_d

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 100 | 39.1 | 7.8 | 1.1 | 15.0 | X | | X | X |
| | *Atriplex torreyi* | 100 | 37.9 | 7.6 | 2.8 | 19.6 | X | | X | X |
| | *Sarcobatus vermiculatus* | 77 | 6.5 | 1.1 | 0.1 | 3.5 | X | | | X |
| | *Artemisia tridentata* | 46 | 5.4 | 0.9 | 0.9 | 2.8 | | | | |
| | *Atriplex confertifolia* | 46 | 1.0 | 0.1 | 0.1 | 0.5 | | | | |
| | *Salix exigua* | 31 | 2.5 | 0.4 | 0.1 | 4.4 | | | | |
| | *Iva axillaris* | 31 | 0.9 | 0.2 | 0.3 | 1.2 | | | | |
| | *Atriplex polycarpa* | 23 | 3.4 | 0.4 | 1.1 | 2.3 | | | | |
| | *Suaeda moquinii* | 23 | 1.0 | 0.2 | 0.1 | 2.3 | | | | |
| | *Atriplex canescens* | 23 | 0.6 | 0.1 | 0.3 | 0.8 | | | | |
| **Herb** | | | | | | | | | | |
| | *Salsola* | 77 | 17.8 | 1.0 | 0.2 | 7.1 | X | | | X |
| | *Sporobolus airoides* | 77 | 18.2 | 0.9 | 0.1 | 3.6 | X | | | X |
| | *Distichlis spicata* | 69 | 21.4 | 1.0 | 0.2 | 5.2 | | | | X |
| | *Glycyrrhiza lepidota* | 46 | 11.3 | 0.7 | 0.0 | 3.6 | | | | |
| | *Eriogonum maculatum* | 31 | 11.1 | 0.2 | 0.3 | 1.0 | | | | |
| | *Atriplex serenana* | 23 | 1.2 | 0.1 | 0.2 | 0.9 | | | | |
| | *Juncus arcticus* | 23 | 0.4 | 0.0 | 0.1 | 0.2 | | | | |

## *Ericameria nauseosa* / *Bromus tectorum* Association

**Common Name:** Rubber Rabbitbrush / Cheatgrass Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: 1845 m
Slope: 15°
Aspect: Northeast-facing

Tree Cover: 0%
Shrub Cover: 35%
Herb Cover: 22%

**Surface Covers:**
Large Rock: 0%
Small Rock: 1%
Fines: 45%
Litter: 52%

**Surveys Used in Description (N = 1):** JAWB0213

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Quercus chrysolepis* | 100 | 100. | 0.2 | 0.2 | 0.2 | X | X | | X |
| **Shrub** | | | | | | | | | | |
| | *Frangula californica* | 100 | 48.0 | 12.0 | 12.0 | 12.0 | X | | X | X |
| | *Ericameria nauseosa* | 100 | 36.0 | 9.0 | 9.0 | 9.0 | X | | X | X |
| | *Ribes roezlii* | 100 | 16.0 | 4.0 | 4.0 | 4.0 | X | | | X |
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 100 | 88.2 | 18.0 | 18.0 | 18.0 | X | X | | X |
| | *Penstemon* | 100 | 4.9 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Phacelia ramosissima* | 100 | 1.0 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Asclepias eriocarpa* | 100 | 1.0 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Leptosiphon parviflorus* | 100 | 1.0 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Lupinus* | 100 | 1.0 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Cordylanthus* | 100 | 1.0 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Astragalus* | 100 | 1.0 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Gayophytum eriospermum* | 100 | 1.0 | 0.2 | 0.2 | 0.2 | X | | | X |

## *Ericameria nauseosa / Sporobolus airoides* Association

**Common Name:** Rubber Rabbitbrush / Alkali Sacaton Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1202 m, Range 1121 – 1273 m
Slope: Mean 2°, Range 0 – 3°
Aspect: no data

Tree Cover: Mean 0.7%, Range 0 – 2%
Shrub Cover: Mean 17.6%, Range 4 – 36%
Herb Cover: Mean 23.1%, Range 3 – 58%

**Surface Covers:**
Large Rock: 0%
Small Rock: Mean 7.0%, Range 0 – 14%
Fines: Mean 56.5%, Range 20 – 93%
Litter: Mean 2.5%, Range 0 – 5%

**Surveys Used in Description (N = 35):** BGP091_d, BGP157_a, BGP205_d, BIS055_d, BIS085_a, BLK008_d, BLK009_a, BLK039_a, BLK059_a, FISH0070, FSL064_a, FSL065_a, FSL116_a, FSL158_a, IND011_a, IND019_a, IND021_a, IND066_d, IND087_a, IND163_a, IND163_d, IND205_a, LNP019_a, PLC024_a, PLC056_a, PLC088_a, PLC106_a, PLC110_d, PLC125_d, PLC136_a, PLC137_a, PLC220_d, PLC223_a, SLTN0725, TIN053_a

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 100 | 57.2 | 10.7 | 1.6 | 30.9 | X | X | | X |
| | *Atriplex torreyi* | 94 | 19.8 | 3.6 | 0.1 | 11.5 | X | | | X |
| | *Sarcobatus vermiculatus* | 71 | 6.0 | 0.8 | 0.2 | 3.7 | | | | X |
| | *Artemisia tridentata* | 51 | 5.9 | 0.9 | 0.1 | 7.3 | | | | X |
| | *Atriplex confertifolia* | 43 | 2.0 | 0.2 | 0.1 | 1.3 | | | | |
| | *Salix exigua* | 34 | 2.4 | 0.5 | 0.1 | 4.7 | | | | |
| | *Stephanomeria* | 31 | 0.6 | 0.0 | 0.1 | 0.4 | | | | |
| | *Machaeranthera carnosa* | 29 | 0.4 | 0.1 | 0.1 | 0.8 | | | | |
| | *Rosa woodsii* | 26 | 0.9 | 0.2 | 0.1 | 2.3 | | | | |
| **Herb** | | | | | | | | | | |
| | *Distichlis spicata* | 100 | 21.8 | 5.0 | 0.1 | 24.8 | X | | | X |
| | *Sporobolus airoides* | 97 | 43.0 | 7.7 | 0.9 | 23.7 | X | | X | X |
| | *Juncus arcticus* | 74 | 2.4 | 0.7 | 0.0 | 3.6 | | | | X |
| | *Glycyrrhiza lepidota* | 66 | 5.4 | 1.5 | 0.1 | 10.4 | | | | X |
| | *Leymus cinereus* | 54 | 1.6 | 0.2 | 0.0 | 1.3 | | | | X |
| | *Leymus triticoides* | 49 | 4.4 | 1.6 | 0.1 | 12.8 | | | | |
| | *Cordylanthus* | 43 | 2.6 | 0.3 | 0.1 | 1.7 | | | | |
| | *Salsola* | 37 | 2.2 | 0.8 | 0.1 | 12.8 | | | | |
| | *Atriplex phyllostegia* | 34 | 1.2 | 0.3 | 0.1 | 4.2 | | | | |
| | *Bassia hyssopifolia* | 29 | 1.8 | 0.9 | 0.1 | 18.8 | | | | |
| | *Cordylanthus maritimus* ssp. *canescens* | 29 | 2.0 | 0.8 | 0.1 | 10.6 | | | | |
| | *Helianthus annuus* | 26 | 2.0 | 0.6 | 0.1 | 11.8 | | | | |
| | *Atriplex truncata* | 23 | 0.5 | 0.2 | 0.3 | 1.8 | | | | |
| | *Atriplex serenana* | 20 | 1.5 | 0.8 | 0.1 | 12.7 | | | | |

## *Ericameria teretifolia* Shrubland Alliance

**Common Name:** Needleleaf rabbitbrush scrub

**NVC Alliance Code:** A2540. *Ericameria teretifolia* Shrubland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Ericameria teretifolia* | 11 | CEGL002963 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1498 m, Range 783 – 1893 m
Slope: Mean 18°, Range 2 – 40°
Aspect: Mostly south-facing

Tree Cover: 0.0%
Shrub Cover: Mean 16.6%, Range 1 – 46%
Herb Cover: Mean 9.3%, Range 0 – 32%

**Surface Covers:**
Large Rock: Mean 40.4%, Range 0.0 –83%
Small Rock: Mean 42.8%, Range 15 – 80%
Fines: Mean 9.0%, Range 1 – 40%
Litter: Mean 3.4%, Range 0 – 15%

**Conservation Status Rank: Global** G4; **State (California)** S4

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | **1** | | **4** | **1** | | | **5** |

**Surveys Used in Description (N = 11):** DEVA9318, DEVAD012, DEVAD154, DEVAS107, DEVAS120, FIR1211061711, MOJC1003, SLTN0418, SLTN0599, SLTN0675, SLTN1146

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria teretifolia* | 100 | 46.6 | 8.3 | 3.0 | 20.0 | **x** | | **x** | **x** |
| | *Eriogonum fasciculatum* | 73 | 12.3 | 1.6 | 1.0 | 4.0 | | | | **x** |
| | *Krascheninnikovia lanata* | 45 | 1.4 | 0.2 | 0.1 | 1.0 | | | | |
| | *Ephedra funerea* | 36 | 2.5 | 0.6 | 0.1 | 5.0 | | | | |
| | *Ephedra viridis* | 36 | 2.3 | 0.3 | 0.1 | 1.0 | | | | |
| | *Grayia spinosa* | 36 | 2.6 | 0.3 | 0.5 | 1.0 | | | | |
| | *Atriplex canescens* | 27 | 1.3 | 0.3 | 0.1 | 2.0 | | | | |
| | *Lycium andersonii* | 27 | 1.0 | 0.1 | 0.1 | 0.5 | | | | |
| | *Stephanomeria pauciflora* | 27 | 0.8 | 0.1 | 0.1 | 0.5 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 82 | 26.6 | 4.6 | 0.1 | 30.0 | **x** | | | **x** |
| | *Achnatherum speciosum* | 64 | 24.8 | 2.0 | 0.1 | 12.0 | | | | **x** |
| | *Sphaeralcea ambigua* | 36 | 1.2 | 0.1 | 0.1 | 0.5 | | | | |
| | *Cryptantha* | 36 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Phacelia* | 27 | 4.6 | 0.6 | 0.1 | 5.0 | | | | |
| | *Bromus tectorum* | 27 | 3.0 | 0.3 | 0.1 | 3.0 | | | | |
| | *Camissonia claviformis* | 27 | 2.0 | 0.1 | 0.1 | 1.0 | | | | |
| | *Salvia columbariae* | 27 | 2.1 | 0.1 | 0.1 | 1.0 | | | | |
| | *Mirabilis laevis* | 27 | 1.1 | 0.1 | 0.1 | 0.5 | | | | |
| | *Gilia* | 27 | 0.7 | 0.0 | 0.1 | 0.1 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Eriogonum fasciculatum* Shrubland Alliance

**Common Name:** California buckwheat scrub

**NVC Alliance Code:** A3884. *Eriogonum fasciculatum - Salvia apiana* Xeric Scrub Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Eriogonum fasciculatum* | 4 | CEGL001258 |
| *Eriogonum fasciculatum* var. *foliolosum – Hesperoyucca whipplei* | 4 | |
| *Hesperoyucca whipplei* | 1 | |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1322 m, Range 796 – 1777 m
Slope: Mean 22°, Range 15 – 27°
Aspect: South-facing

Tree Cover: Mean 1.2%, Range 0 – 6%
Shrub Cover: Mean 15.8%, Range 4 – 29%
Herb Cover: Mean 17.7%, Range 2 – 37%

**Surface Covers:**
Large Rock: Mean 6.7%, Range 0.0 –23%
Small Rock: Mean 15.7%, Range 1 – 32%
Fines: Mean 67.6%, Range 38 – 85%
Litter: Mean 7.4%, Range 3 – 20%

**Conservation Status Rank: Global** G5; **State (California)** S5

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | **5** | **2** | | | | | **1** | |

**Surveys Used in Description (N = 9):** ERSKAG01, F1806061523, JAWB0008, JAWB0029, JAWB0039, JAWB0217, JAWB0218, POA1504011708, ZOE1504130837

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Quercus douglasii* | 22 | 19.4 | 0.8 | 2.0 | 5.2 | | | | |
| | *Juniperus californica* | 22 | 22.2 | 0.0 | 0.2 | 0.2 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Eriogonum fasciculatum* | 100 | 62.0 | 9.8 | 3.0 | 24.0 | **x** | **x** | | **x** |
| | *Hesperoyucca whipplei* | 67 | 16.7 | 3.1 | 0.2 | 11.0 | | | | **x** |
| | *Ericameria linearifolia* | 56 | 2.1 | 0.2 | 0.2 | 1.0 | | | | **x** |
| | *Ephedra viridis* | 33 | 4.6 | 0.6 | 0.2 | 3.0 | | | | |
| | *Rhamnus ilicifolia* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cercocarpus montanus* var. *glaber* | 22 | 2.0 | 0.6 | 0.2 | 5.0 | | | | |
| | *Coleogyne ramosissima* | 22 | 1.0 | 0.2 | 0.2 | 2.0 | | | | |
| | *Ericameria nauseosa* | 22 | 1.2 | 0.1 | 0.2 | 1.0 | | | | |
| | *Ericameria cuneata* | 22 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Erodium cicutarium* | 100 | 26.5 | 5.7 | 1.0 | 15.0 | **x** | | | **x** |
| | *Bromus rubens* | 67 | 16.2 | 4.0 | 1.0 | 15.0 | | | | **x** |
| | *Bromus tectorum* | 56 | 12.3 | 3.0 | 0.2 | 13.0 | | | | **x** |
| | *Amsinckia* | 44 | 1.0 | 0.2 | 0.2 | 1.6 | | | | |
| | *Salvia columbariae* | 44 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus diandrus* | 33 | 12.4 | 3.8 | 0.2 | 19.0 | | | | |
| | *Avena* | 33 | 4.3 | 1.5 | 0.2 | 10.0 | | | | |
| | *Schismus* | 33 | 7.2 | 0.8 | 1.0 | 4.0 | | | | |
| | *Cryptantha* | 33 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Poa secunda* | 22 | 4.8 | 0.4 | 1.0 | 3.0 | | | | |
| | *Cuscuta* | 22 | 0.2 | 0.0 | 0.2 | 0.2 | | | | |
| | *Dudleya abramsii* | 22 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| | *Stephanomeria exigua* | 22 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |
| | *Lotus strigosus* | 22 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Gilia capitata* | 22 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Calochortus venustus* | 22 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Eriogonum baileyi* | 22 | 0.2 | 0.0 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 22 | 21.7 | 0.5 | 0.2 | 4.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Eriogonum fasciculatum* Association

**Common Name:** California Buckwheat Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1321 m, Range 796 – 1777 m
Slope: Mean 18°, Range 15 – 20°
Aspect: Southwest-facing

Tree Cover: Mean 2.0%, Range 0 – 6%
Shrub Cover: Mean 16.5%, Range 4 – 29%
Herb Cover: Mean 15.3%, Range 2 – 37%

**Surface Covers:**
Large Rock: Mean 5.1%, Range 0.2 –10%
Small Rock: Mean 1.2%, Range 1.2 – 1.2%
Fines: Mean 80.5%, Range 76 – 85%
Litter: Mean 11.5%, Range 3 – 20%

**Surveys Used in Description (N = 4):** JAWB0217, JAWB0218, POA1504011708, ZOE1504130837

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | Dom | cDom | Often |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Quercus douglasii* | 50 | 43.7 | 1.8 | 2.0 | 5.2 | | | | X |
| *Pinus monophylla* | 25 | 4.0 | 0.3 | 1.0 | 1.0 | | | | |
| *Ailanthus altissima* | 25 | 2.3 | 0.1 | 0.2 | 0.2 | | | | |
| **Shrub** | | | | | | | | | |
| *Eriogonum fasciculatum* | 100 | 86.6 | 13.8 | 3.0 | 24.0 | X | X | | X |
| *Cercocarpus montanus* var. *glaber* | 50 | 4.5 | 1.3 | 0.2 | 5.0 | | | | X |
| *Ericameria nauseosa* | 50 | 2.7 | 0.3 | 0.2 | 1.0 | | | | X |
| *Rhamnus ilicifolia* | 50 | 0.4 | 0.1 | 0.2 | 0.2 | | | | X |
| *Hesperoyucca whipplei* | 25 | 3.6 | 0.8 | 3.0 | 3.0 | | | | |
| *Sambucus nigra* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| *Ephedra viridis* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Ericameria linearifolia* | 25 | 1.5 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | |
| *Erodium cicutarium* | 100 | 29.0 | 4.5 | 3.0 | 6.0 | X | | | X |
| *Bromus diandrus* | 50 | 27.7 | 8.5 | 15.0 | 19.0 | | | | X |
| *Bromus tectorum* | 50 | 25.2 | 6.3 | 12.0 | 13.0 | | | | X |
| *Bromus rubens* | 25 | 6.0 | 1.5 | 6.0 | 6.0 | | | | |
| *Vulpia* | 25 | 9.6 | 0.5 | 2.0 | 2.0 | | | | |
| *Thysanocarpus* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| *Cryptantha* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| *Cuscuta* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| *Eriogonum baileyi* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| *Chorizanthe* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| *Stephanomeria exigua* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| *Bromus madritensis* | 25 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | |
| Lichen | 25 | 25.0 | 0.1 | 0.2 | 0.2 | | | | |

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

**Common Name:** California Buckwheat – Our Lord's Candle Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1308 m, Range 1152 – 1385 m
Slope: Mean 25°, Range 22 – 27°
Aspect: South-facing

Tree Cover: Mean 0.1%, Range 0 – 0.2%
Shrub Cover: Mean 12.0%, Range 9 – 15%
Herb Cover: Mean 23.1%, Range 5 – 32%

**Surface Covers:**
Large Rock: Mean 0.2%, Range 0.0 –0.4%
Small Rock: Mean 22.0%, Range 12 – 32%
Fines: Mean 69.5%, Range 62 – 77%
Litter: Mean 4.0%, Range 3 – 5%

**Surveys Used in Description (N = 4):** ERSKAG01, F1806061523, JAWB0029, JAWB0039

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Juniperus californica* | 50 | 50.0 | 0.1 | 0.2 | 0.2 | | | | X |
| **Shrub** | | | | | | | | | | |
| | *Eriogonum fasciculatum* | 100 | 47.6 | 6.8 | 3.3 | 12.0 | X | | X | X |
| | *Hesperoyucca whipplei* | 100 | 24.1 | 3.6 | 0.2 | 6.0 | X | | | X |
| | *Ericameria linearifolia* | 100 | 3.3 | 0.4 | 0.2 | 1.0 | X | | | X |
| | *Ericameria cuneata* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Ephedra viridis* | 25 | 8.3 | 0.8 | 3.0 | 3.0 | | | | |
| | *Lupinus albifrons* | 25 | 5.5 | 0.5 | 2.0 | 2.0 | | | | |
| | *Ephedra nevadensis* | 25 | 2.1 | 0.3 | 1.0 | 1.0 | | | | |
| | *Eriogonum wrightii* | 25 | 2.1 | 0.3 | 1.0 | 1.0 | | | | |
| | *Gutierrezia microcephala* | 25 | 2.1 | 0.3 | 1.0 | 1.0 | | | | |
| | *Ceanothus cuneatus* | 25 | 1.4 | 0.3 | 1.0 | 1.0 | | | | |
| | *Fremontodendron californicum* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Galium matthewsii* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Rhamnus ilicifolia* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Prunus fasciculata* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Coleogyne ramosissima* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Stephanomeria pauciflora* | 25 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Erodium cicutarium* | 100 | 27.3 | 8.0 | 1.0 | 15.0 | X | | | X |
| | *Bromus rubens* | 100 | 23.6 | 7.0 | 1.0 | 15.0 | X | | | X |
| | *Avena* | 75 | 9.7 | 3.3 | 0.2 | 10.0 | X | | | X |
| | *Schismus* | 75 | 16.2 | 1.8 | 1.0 | 4.0 | X | | | X |
| | *Amsinckia* | 75 | 1.5 | 0.5 | 0.2 | 1.6 | X | | | X |
| | *Salvia columbariae* | 75 | 0.5 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Bromus tectorum* | 50 | 1.7 | 0.6 | 0.2 | 2.0 | | | | X |
| | *Calochortus venustus* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Lotus strigosus* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Gilia capitata* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Cryptantha* | 50 | 0.8 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Bromus arenarius* | 25 | 7.7 | 2.5 | 10.0 | 10.0 | | | | |
| | *Phacelia egena* | 25 | 0.8 | 0.3 | 1.0 | 1.0 | | | | |
| | *Lotus* | 25 | 3.5 | 0.3 | 1.0 | 1.0 | | | | |
| | *Poa secunda* | 25 | 0.8 | 0.3 | 1.0 | 1.0 | | | | |
| | *Micropus californicus* | 25 | 0.7 | 0.3 | 1.0 | 1.0 | | | | |
| | *Chorizanthe xanti* | 25 | 0.7 | 0.3 | 1.0 | 1.0 | | | | |
| | *Dichelostemma capitatum* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum baileyi* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Dudleya abramsii* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum nidularium* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Chamaesyce albomarginata* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Arabis sparsiflora* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Caulanthus coulteri* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Descurainia pinnata* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cuscuta* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriophyllum* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cryptantha mohavensis* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Corethrogyne filaginifolia* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Chenopodium* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus diandrus* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Chaenactis glabriuscula* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Phacelia tanacetifolia* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Stephanomeria virgata* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Phacelia cicutaria* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Nassella cernua* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Melica imperfecta* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Lupinus bicolor* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Coreopsis bigelovii* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eschscholzia caespitosa* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 25 | 23.8 | 1.0 | 4.0 | 4.0 | | | | |
| | Cryptogammic crust | 25 | 1.2 | 0.1 | 0.2 | 0.2 | | | | |

## *Hesperoyucca whipplei* Provisional Association

**Common Name:** Our Lord's Candle Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: 1378 m
Slope: no data
Aspect: Variable

Tree Cover: 1%
Shrub Cover: 28%
Herb Cover: 6%

**Surface Covers:**
Large Rock: 23%
Small Rock: 32%
Fines: 38%
Litter: 6%

**Surveys Used in Description (N = 1):** JAWB0008

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Yucca brevifolia* | 100 | 100. | 1.0 | 1.0 | 1.0 | X | X | | X |
| **Shrub** | | | | | | | | | | |
| | *Hesperoyucca whipplei* | 100 | 39.0 | 11.0 | 11.0 | 11.0 | X | | X | X |
| | *Ericameria teretifolia* | 100 | 21.3 | 6.0 | 6.0 | 6.0 | X | | | X |
| | *Eriogonum fasciculatum* | 100 | 21.3 | 6.0 | 6.0 | 6.0 | X | | | X |
| | *Ephedra viridis* | 100 | 7.1 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Coleogyne ramosissima* | 100 | 7.1 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Encelia actonii* | 100 | 3.5 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Artemisia californica* | 100 | 0.7 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Herb** | | | | | | | | | | |
| | *Poa secunda* | 100 | 40.5 | 3.0 | 3.0 | 3.0 | X | | X | X |
| | *Bromus rubens* | 100 | 27.0 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Erodium cicutarium* | 100 | 13.5 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Achnatherum speciosum* | 100 | 2.7 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Bromus tectorum* | 100 | 2.7 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Dudleya abramsii* | 100 | 2.7 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Pentagramma triangularis* | 100 | 2.7 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Stephanomeria exigua* | 100 | 2.7 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Salvia columbariae* | 100 | 2.7 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Amsinckia* | 100 | 2.7 | 0.2 | 0.2 | 0.2 | X | | | X |

## *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

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Eriogonum fasciculatum – Ericameria (laricifolia, linearifolia)* | 23 | CEPP006705 |
| *Eriogonum fasciculatum* rock outcrop | 18 | CEGL001260 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1481 m, Range 742 – 2074 m
Slope: Mean 23°, Range 2 – 40°
Aspect: Variable

Tree Cover: Mean 0.5%, Range 0 – 4%
Shrub Cover: Mean 13.3%, Range 2 – 40%
Herb Cover: Mean 8.0%, Range 0 – 47%

**Surface Covers:**
Large Rock: Mean 22.8%, Range 0.1 –85%
Small Rock: Mean 50.2%, Range 0 – 89%
Fines: Mean 10.0%, Range 0 – 63%
Litter: Mean 1.7%, Range 0 – 11%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | | **6** | **1** | **10** | | **1** | | **22** |

**Surveys Used in Description (N = 41):** D06021122, DEVA0102, DEVA0342, DEVA9107, DEVA9198, DEVA9218, DEVA9268, DEVA9296, DEVA9302, DEVA9305, DEVA9363, DEVA9404, DEVA9464, DEVA9482, DEVA9487, DEVA9489, DEVA9490, DEVA9523, DEVA9638, DEVA9645, DEVA9911, DEVA9923, DEVAS042, DEVAS094, DEVAS134, MOJC0634, MOJC0708, MOJC0989, SLTN0222, SLTN0356, SLTN0417, SLTN0549, SLTN0613, SLTN0674, SLTN0737, SLTN0756, SLTN0852, SLTN1050, SLTN1143, SLTN1151, TEHA0023

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Eriogonum fasciculatum* | 100 | 37.0 | 6.1 | 0.5 | 30.0 | **x** | | **x** | **x** |
| | *Ephedra viridis* | 51 | 6.1 | 0.7 | 0.1 | 3.0 | | | | **x** |
| | *Ericameria laricifolia* | 39 | 9.0 | 1.1 | 0.2 | 5.0 | | | | |
| | *Ephedra nevadensis* | 37 | 3.6 | 0.8 | 0.1 | 9.0 | | | | |
| | *Lycium andersonii* | 34 | 2.8 | 0.3 | 0.1 | 4.0 | | | | |
| | *Xylorhiza tortifolia* | 32 | 1.3 | 0.1 | 0.1 | 2.0 | | | | |
| | *Atriplex confertifolia* | 29 | 3.1 | 0.3 | 0.1 | 4.0 | | | | |
| | *Ambrosia dumosa* | 29 | 2.4 | 0.3 | 0.2 | 2.0 | | | | |
| | *Hymenoclea salsola* | 29 | 1.3 | 0.2 | 0.1 | 3.0 | | | | |
| | *Ericameria cooperi* | 29 | 1.0 | 0.2 | 0.1 | 5.0 | | | | |
| | *Tetradymia axillaris* | 29 | 0.6 | 0.1 | 0.1 | 2.0 | | | | |
| | *Stephanomeria pauciflora* | 29 | 0.7 | 0.1 | 0.1 | 1.0 | | | | |
| | *Grayia spinosa* | 27 | 1.7 | 0.2 | 0.1 | 3.0 | | | | |
| | *Ericameria teretifolia* | 24 | 1.7 | 0.4 | 0.1 | 4.0 | | | | |
| | *Opuntia basilaris* | 24 | 0.4 | 0.1 | 0.1 | 0.5 | | | | |
| | *Ericameria linearifolia* | 22 | 2.9 | 0.4 | 0.1 | 4.0 | | | | |
| | *Gutierrezia microcephala* | 22 | 1.1 | 0.1 | 0.1 | 1.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Achnatherum speciosum* | 73 | 18.2 | 0.8 | 0.1 | 8.0 | | | | **x** |
| | *Bromus rubens* | 63 | 16.5 | 1.3 | 0.1 | 20.0 | | | | **x** |
| | *Amsinckia* | 39 | 4.0 | 0.2 | 0.1 | 5.0 | | | | |
| | *Sphaeralcea ambigua* | 39 | 2.5 | 0.1 | 0.1 | 0.5 | | | | |
| | *Gilia* | 34 | 2.3 | 0.1 | 0.1 | 1.0 | | | | |
| | *Cryptantha* | 29 | 1.6 | 0.0 | 0.1 | 0.2 | | | | |
| | *Salvia columbariae* | 27 | 1.2 | 0.1 | 0.1 | 2.0 | | | | |
| | *Bromus tectorum* | 24 | 5.1 | 0.9 | 0.1 | 30.0 | | | | |
| | *Eriogonum inflatum* | 24 | 2.6 | 0.1 | 0.1 | 0.5 | | | | |
| | *Delphinium* | 24 | 1.2 | 0.0 | 0.1 | 0.2 | | | | |
| | *Elymus elymoides* | 22 | 1.2 | 0.1 | 0.1 | 3.0 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 37 | 24.5 | 0.2 | 0.2 | 4.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Eriogonum fasciculatum – Ericameria (laricifolia, linearifolia)* Association

**Common Name:** California Buckwheat – Goldenbush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1573 m, Range 1207 – 2074 m
Slope: Mean 25°, Range 2 – 40°
Aspect: Variable

Tree Cover: Mean 0.8%, Range 0 – 4%
Shrub Cover: Mean 12.1%, Range 2 – 30%
Herb Cover: Mean 6.7%, Range 1 – 38%

**Surface Covers:**
Large Rock: Mean 21.3%, Range 0.1 –85%
Small Rock: Mean 53.9%, Range 0 – 88%
Fines: Mean 7.1%, Range 0 – 35%
Litter: Mean 1.8%, Range 0 – 5%

**Surveys Used in Description (N = 23):** DEVA0102, DEVA0342, DEVA9107, DEVA9198, DEVA9218, DEVA9268, DEVA9296, DEVA9305, DEVA9404, DEVA9482, DEVA9487, DEVA9490, DEVA9523, DEVA9638, DEVA9911, DEVA9923, MOJC0634, MOJC0989, SLTN0222, SLTN0613, SLTN0674, SLTN0737, TEHA0023

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Eriogonum fasciculatum* | 100 | 30.5 | 4.1 | 1.0 | 12.0 | X | | X | X |
| | *Ericameria laricifolia* | 68 | 16.7 | 2.0 | 1.0 | 5.0 | | | | X |
| | *Ephedra viridis* | 64 | 8.1 | 0.9 | 0.1 | 3.0 | | | | X |
| | *Ephedra nevadensis* | 36 | 5.0 | 1.0 | 0.2 | 9.0 | | | | |
| | *Grayia spinosa* | 32 | 2.0 | 0.2 | 0.1 | 2.0 | | | | |
| | *Gutierrezia microcephala* | 32 | 1.6 | 0.2 | 0.1 | 1.0 | | | | |
| | *Tetradymia axillaris* | 32 | 0.8 | 0.2 | 0.1 | 2.0 | | | | |
| | *Stephanomeria pauciflora* | 32 | 1.0 | 0.1 | 0.2 | 1.0 | | | | |
| | *Opuntia basilaris* | 32 | 0.6 | 0.1 | 0.1 | 0.5 | | | | |
| | *Ericameria linearifolia* | 27 | 5.0 | 0.6 | 1.0 | 4.0 | | | | |
| | *Ericameria cooperi* | 27 | 1.1 | 0.3 | 0.2 | 5.0 | | | | |
| | *Purshia glandulosa* | 27 | 1.9 | 0.2 | 0.1 | 2.0 | | | | |
| | *Artemisia tridentata* | 27 | 1.6 | 0.2 | 0.1 | 3.0 | | | | |
| | *Lycium andersonii* | 27 | 1.4 | 0.2 | 0.2 | 1.5 | | | | |
| | *Atriplex confertifolia* | 23 | 1.2 | 0.1 | 0.2 | 1.0 | | | | |
| | *Echinocereus engelmannii* | 23 | 0.5 | 0.1 | 0.2 | 0.5 | | | | |
| | *Achnatherum speciosum* | 86 | 19.1 | 0.9 | 0.1 | 6.0 | X | | | X |
| | *Bromus rubens* | 59 | 17.9 | 1.3 | 0.1 | 10.0 | | | | X |
| | *Gilia* | 50 | 3.1 | 0.1 | 0.1 | 1.0 | | | | X |
| | *Sphaeralcea ambigua* | 45 | 2.2 | 0.1 | 0.1 | 0.5 | | | | |
| | *Elymus elymoides* | 36 | 2.2 | 0.2 | 0.1 | 3.0 | | | | |
| | *Salvia columbariae* | 32 | 1.5 | 0.1 | 0.1 | 0.2 | | | | |
| | *Bromus tectorum* | 27 | 7.8 | 1.7 | 0.2 | 30.0 | | | | |
| | *Poa secunda* | 27 | 2.7 | 0.1 | 0.2 | 1.0 | | | | |
| | *Amsinckia* | 27 | 2.7 | 0.1 | 0.1 | 2.0 | | | | |
| | *Mirabilis laevis* | 27 | 1.3 | 0.1 | 0.2 | 0.5 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 50 | 37.4 | 0.3 | 0.2 | 4.0 | | | | X |
| | Cryptogammic crust | 23 | 16.1 | 0.2 | 0.2 | 3.0 | | | | |

## *Eriogonum fasciculatum* rock outcrop Association

**Common Name:** California Buckwheat rock outcrop Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1375 m, Range 742 – 1917 m
Slope: Mean 22°, Range 6 – 40°
Aspect: Southwest-facing

Tree Cover: Mean 0.3%, Range 0 – 2%
Shrub Cover: Mean 14.6%, Range 3 – 40%
Herb Cover: Mean 9.5%, Range 0 – 47%

**Surface Covers:**
Large Rock: Mean 24.6%, Range 0.2 –68%
Small Rock: Mean 45.6%, Range 8 – 89%
Fines: Mean 13.5%, Range 0 – 63%
Litter: Mean 1.5%, Range 0 – 11%

**Surveys Used in Description (N = 18):** D06021122, DEVA9302, DEVA9363, DEVA9464, DEVA9489, DEVA9645, DEVAS042, DEVAS094, DEVAS134, MOJC0708, SLTN0356, SLTN0417, SLTN0549, SLTN0756, SLTN0852, SLTN1050, SLTN1143, SLTN1151

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Eriogonum fasciculatum* | 100 | 44.5 | 8.4 | 0.5 | 30.0 | X | | X | X |
| | *Xylorhiza tortifolia* | 47 | 2.4 | 0.2 | 0.1 | 2.0 | | | | |
| | *Ambrosia dumosa* | 42 | 4.8 | 0.5 | 0.2 | 2.0 | | | | |
| | *Lycium andersonii* | 42 | 4.5 | 0.5 | 0.1 | 4.0 | | | | |
| | *Hymenoclea salsola* | 42 | 1.9 | 0.3 | 0.1 | 3.0 | | | | |
| | *Atriplex confertifolia* | 37 | 5.3 | 0.5 | 0.1 | 4.0 | | | | |
| | *Ephedra viridis* | 37 | 3.7 | 0.5 | 0.1 | 2.0 | | | | |
| | *Ephedra nevadensis* | 37 | 2.0 | 0.5 | 0.1 | 4.0 | | | | |
| | *Larrea tridentata* | 32 | 4.4 | 0.5 | 0.5 | 3.0 | | | | |
| | *Ericameria teretifolia* | 32 | 1.3 | 0.4 | 0.1 | 3.0 | | | | |
| | *Krascheninnikovia lanata* | 32 | 1.4 | 0.3 | 0.1 | 3.0 | | | | |
| | *Ericameria cooperi* | 32 | 0.9 | 0.1 | 0.1 | 1.0 | | | | |
| | *Tetradymia axillaris* | 26 | 0.4 | 0.1 | 0.1 | 1.0 | | | | |
| | *Stephanomeria pauciflora* | 26 | 0.5 | 0.0 | 0.1 | 0.2 | | | | |
| | *Grayia spinosa* | 21 | 1.3 | 0.3 | 0.1 | 3.0 | | | | |
| | *Coleogyne ramosissima* | 21 | 0.8 | 0.1 | 0.1 | 1.5 | | | | |
| | *Encelia actonii* | 21 | 1.0 | 0.1 | 0.1 | 1.5 | | | | |
| | *Bromus rubens* | 68 | 14.8 | 1.3 | 0.1 | 20.0 | | | | X |
| | *Achnatherum speciosum* | 58 | 17.2 | 0.8 | 0.1 | 8.0 | | | | X |
| | *Amsinckia* | 53 | 5.5 | 0.4 | 0.1 | 5.0 | | | | X |
| | *Eriogonum inflatum* | 42 | 4.8 | 0.1 | 0.1 | 0.5 | | | | |
| | *Cryptantha* | 37 | 2.7 | 0.1 | 0.1 | 0.2 | | | | |
| | Graminoid (grass or grasslike) | 32 | 5.9 | 0.2 | 0.1 | 1.5 | | | | |
| | *Sphaeralcea ambigua* | 32 | 2.8 | 0.1 | 0.1 | 0.5 | | | | |
| | *Eriophyllum* | 26 | 4.9 | 0.5 | 0.1 | 8.0 | | | | |
| | *Delphinium* | 26 | 1.3 | 0.0 | 0.1 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 21 | 9.6 | 0.0 | 0.2 | 0.2 | | | | |

## *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 |
|---|---|---|
| *Eriogonum wrightii (*ssp. *subscaposum,* ssp. *wrightii)* | 6 | CEPP006708 |

### Classification Comments:

### Plot/Sample Data Summary:

Elevation: Mean 1368 m, Range 898 – 2078 m
Slope: Mean 18°, Range 4 – 39°
Aspect: Northeast-facing

Tree Cover: Mean 0.6%, Range 0 – 2%
Shrub Cover: Mean 17.4%, Range 9 – 25%
Herb Cover: Mean 16.8%, Range 3 – 33%

**Surface Covers:**
Large Rock: Mean 0.8%, Range 0.0 –3%
Small Rock: Mean 42.6%, Range 6 – 95%
Fines: Mean 47.3%, Range 0 – 78%
Litter: Mean 6.8%, Range 2 – 12%

**Conservation Status Rank: Global** G3; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **4** | **1** | | | | | **1** | |

**Surveys Used in Description (N = 6):** C06021407, ERSKAG03, JAWB0007, JAWB0043, JAWB0210, TEHA0040

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Eriogonum wrightii* | 100 | 67.0 | 11.4 | 3.3 | 18.0 | x | x | | x |
| | *Ericameria linearifolia* | 67 | 7.5 | 1.8 | 0.2 | 10.0 | | | | x |
| | *Lupinus excubitus* | 33 | 11.9 | 3.0 | 3.0 | 15.0 | | | | |
| | *Lotus scoparius* | 33 | 3.8 | 0.4 | 0.2 | 2.0 | | | | |
| | *Eriogonum fasciculatum* | 33 | 3.1 | 0.4 | 0.2 | 2.0 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Poa secunda* | 67 | 11.5 | 2.7 | 0.2 | 10.0 | | | | **x** |
| | *Bromus rubens* | 67 | 16.7 | 2.7 | 1.0 | 10.0 | | | | **x** |
| | *Bromus tectorum* | 50 | 15.8 | 2.4 | 0.2 | 12.0 | | | | **x** |
| | *Amsinckia* | 50 | 0.9 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Achnatherum speciosum* | 33 | 6.5 | 1.7 | 0.2 | 10.0 | | | | |
| | *Elymus elymoides* | 33 | 6.3 | 1.7 | 0.2 | 10.0 | | | | |
| | *Avena* | 33 | 3.3 | 1.0 | 0.2 | 6.0 | | | | |
| | *Corethrogyne filaginifolia* | 33 | 1.6 | 0.5 | 0.2 | 3.0 | | | | |
| | *Eschscholzia caespitosa* | 33 | 3.7 | 0.5 | 0.2 | 3.0 | | | | |
| | *Melica imperfecta* | 33 | 2.5 | 0.4 | 0.2 | 2.0 | | | | |
| | *Mentzelia albicaulis* | 33 | 1.1 | 0.2 | 0.2 | 1.0 | | | | |
| | *Eriogonum baileyi* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cryptantha* | 33 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |

## *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 – Atriplex confertifolia* | 53 | CEGL005757 |
| *Larrea tridentata – Ambrosia dumosa – Ambrosia salsola* | 13 | CEGL005761 |
| *Larrea tridentata – Ambrosia dumosa* | 71 | CEGL002954 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 874 m, Range 0 – 1608 m
Slope: Mean 10°, Range 0 – 30°
Aspect: Variable

Tree Cover: Mean 0.0%, Range 0 – 1%
Shrub Cover: Mean 10.3%, Range 1 – 50%
Herb Cover: Mean 5.5%, Range 0 – 90%

**Surface Covers:**
Large Rock: Mean 8.2%, Range 0.0 –63%
Small Rock: Mean 67.6%, Range 0 – 100%
Fines: Mean 16.4%, Range 0 – 81%
Litter: Mean 1.1%, Range 0 – 14%

**Conservation Status Rank: Global** G5; **State (California)** S5

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **1** | | | **86** | | | | **50** |

**Surveys Used in Description (N = 137):** DEVA0285, DEVA0666, DEVA9120, DEVA9154, DEVA9185, DEVA9186, DEVA9187, DEVA9259, DEVA9272, DEVA9288, DEVA9310, DEVA9320, DEVA9338, DEVA9349, DEVA9359, DEVA9419, DEVA9436, DEVA9448, DEVA9452, DEVA9459, DEVA9511, DEVA9545, DEVA9623, DEVA9631, DEVA9632, DEVA9640, DEVA9643, DEVA9647, DEVA9800, DEVAD002, DEVAD010, DEVAD019, DEVAD031, DEVAD032, DEVAD044, DEVAD063, DEVAD067, DEVAD086, DEVAD091, DEVAD092, DEVAD097, DEVAD222, DEVAS021, DEVAS023, DEVAS025, DEVAS034, DEVAS060, DEVAS061, DEVAS062, DEVAS066, DEVAS069, DEVAS095, DEVAS118, DEVAS123, DEVAS189, DEVAS192, DEVAS193, F1806061149, MOJC0172, MOJC0362, MOJC0376, MOJC0417, MOJC0456, MOJC0457, MOJC0470, MOJC0484, MOJC0510, MOJC0511, MOJC0512, MOJC0513, MOJC0514, MOJC0518, MOJC0520, MOJC0535, MOJC0544, MOJC0545, MOJC0546, MOJC0558, MOJC0570, MOJC0575, MOJC0589, MOJC0614, MOJC0615, MOJC0630, MOJC0642, MOJC0647, MOJC0653, MOJC0656, MOJC0661, MOJC0687, MOJC0688, MOJC0693, MOJC0710, MOJC0769, MOJC0786, MOJC0805, MOJC0808, MOJC0911, MOJC0960, MOJC1006, MOJC1007, MOJC1009, MOJC1011, MOJC1013, MOJC1015, MOJC1019, MOJC1042, MOJC1053, MOJC1054, MOJC1055, MOJC1056, MOJC1057, MOJC1104, MOJC1168, MOJC1170, MOJC1171, MOJC1172, MOJC1173, SLTN0530, SLTN0536, SLTN0540, SLTN0548, SLTN0617, SLTN0711, SLTN0728, SLTN0731, SLTN0743, SLTN0750, SLTN0948, SLTN0955, SLTN0958, SLTN0975, SLTN0979, SLTN1084, SLTN1096, SLTN1103, SLTN1206

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Larrea tridentata* | 100 | 42.4 | 5.4 | 0.5 | 35.0 | **x** | | **x** | **x** |
| | *Ambrosia dumosa* | 100 | 37.7 | 5.1 | 0.5 | 20.0 | **x** | | **x** | **x** |
| | *Atriplex confertifolia* | 43 | 5.1 | 0.9 | 0.1 | 10.0 | | | | |
| | *Opuntia basilaris* | 37 | 0.9 | 0.1 | 0.0 | 1.0 | | | | |
| | *Echinocactus polycephalus* | 34 | 1.0 | 0.1 | 0.1 | 1.0 | | | | |
| | *Xylorhiza tortifolia* | 29 | 0.8 | 0.1 | 0.1 | 3.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Eriogonum inflatum* | 58 | 16.0 | 0.2 | 0.0 | 3.0 | | | | **x** |
| | *Chorizanthe rigida* | 34 | 4.4 | 0.1 | 0.1 | 1.0 | | | | |
| | *Bromus rubens* | 30 | 6.7 | 0.3 | 0.1 | 10.0 | | | | |
| | *Cryptantha* | 29 | 3.3 | 0.1 | 0.1 | 1.0 | | | | |
| | *Schismus* | 24 | 12.0 | 1.3 | 0.1 | 55.0 | | | | |
| | *Plantago ovata* | 20 | 6.7 | 0.5 | 0.1 | 23.0 | | | | |
| | *Chaenactis* | 20 | 2.8 | 0.3 | 0.1 | 15.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Larrea tridentata – Ambrosia dumosa* Association

**Common Name:** Creosote Bush – White Bursage Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 715 m, Range 0 – 1309 m
Slope: Mean 7°, Range 0 – 30°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 8.7%, Range 1 – 40%
Herb Cover: Mean 5.9%, Range 0 – 90%

**Surface Covers:**
Large Rock: Mean 8.8%, Range 0.0 –63%
Small Rock: Mean 64.4%, Range 3 – 100%
Fines: Mean 16.2%, Range 0 – 81%
Litter: Mean 1.1%, Range 0 – 14%

**Surveys Used in Description (N = 71):** DEVA9154, DEVA9185, DEVA9187, DEVA9259, DEVA9272, DEVA9288, DEVA9320, DEVA9349, DEVA9436, DEVA9448, DEVA9459, DEVA9545, DEVA9632, DEVA9800, DEVAD044, DEVAD086, DEVAD092, DEVAD097, DEVAS021, DEVAS023, DEVAS025, DEVAS034, DEVAS060, DEVAS061, DEVAS095, DEVAS189, DEVAS192, DEVAS193, F1806061149, MOJC0470, MOJC0484, MOJC0510, MOJC0511, MOJC0512, MOJC0513, MOJC0514, MOJC0518, MOJC0520, MOJC0535, MOJC0575, MOJC0589, MOJC0630, MOJC0661, MOJC0693, MOJC0786, MOJC0805, MOJC0808, MOJC0911, MOJC1006, MOJC1007, MOJC1011, MOJC1053, MOJC1054, MOJC1055, MOJC1057, MOJC1168, MOJC1170, SLTN0530, SLTN0536, SLTN0540, SLTN0711, SLTN0731, SLTN0743, SLTN0750, SLTN0948, SLTN0955, SLTN0958, SLTN0975, SLTN1084, SLTN1096, SLTN1206

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Larrea tridentata* | 100 | 52.6 | 5.5 | 1.0 | 30.0 | X | X | | X |
| | *Ambrosia dumosa* | 100 | 39.8 | 4.4 | 1.0 | 20.0 | X | | X | X |
| | *Opuntia basilaris* | 30 | 1.0 | 0.1 | 0.1 | 0.5 | | | | |
| | *Echinocactus polycephalus* | 27 | 1.0 | 0.1 | 0.1 | 0.5 | | | | |
| **Herb** | | | | | | | | | | |
| | *Eriogonum inflatum* | 41 | 12.0 | 0.1 | 0.1 | 1.0 | | | | |
| | *Chorizanthe rigida* | 41 | 6.2 | 0.1 | 0.1 | 1.0 | | | | |
| | *Cryptantha* | 39 | 4.6 | 0.1 | 0.1 | 1.0 | | | | |
| | *Schismus* | 28 | 14.3 | 1.7 | 0.1 | 55.0 | | | | |
| | *Plantago ovata* | 27 | 11.0 | 0.8 | 0.1 | 23.0 | | | | |
| | *Cuscuta* | 23 | 6.4 | 0.3 | 0.1 | 15.0 | | | | |
| | *Bromus rubens* | 23 | 4.0 | 0.2 | 0.1 | 10.0 | | | | |
| | *Chorizanthe brevicornu* | 23 | 1.2 | 0.0 | 0.1 | 0.2 | | | | |

## *Larrea tridentata – Ambrosia dumosa – Ambrosia salsola* Association

**Common Name:** Creosote Bush – White Bursage – Cheesebush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 830 m, Range 96 – 1335 m
Slope: Mean 7°, Range 1 – 15°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 12.4%, Range 3 – 35%
Herb Cover: Mean 4.8%, Range 0 – 25%

**Surface Covers:**
Large Rock: Mean 4.6%, Range 0.0 –25%
Small Rock: Mean 78.1%, Range 60 – 92%
Fines: Mean 11.8%, Range 1 – 38%
Litter: Mean 2.4%, Range 0 – 8%

**Surveys Used in Description (N = 13):** DEVA0285, DEVA9186, DEVA9623, DEVA9631, DEVA9643, DEVAD091, DEVAS118, MOJC0769, MOJC1009, MOJC1013, MOJC1015, MOJC1056, SLTN0548

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ambrosia dumosa* | 100 | 30.9 | 4.8 | 0.5 | 20.0 | X | | X | X |
| | *Larrea tridentata* | 100 | 33.5 | 4.7 | 1.0 | 15.0 | X | | X | X |
| | *Hymenoclea salsola* | 100 | 15.1 | 2.1 | 0.2 | 5.0 | X | | | X |
| | *Lycium andersonii* | 40 | 2.3 | 0.3 | 0.2 | 2.0 | | | | |
| | *Psorothamnus arborescens* | 33 | 2.2 | 0.3 | 0.1 | 2.0 | | | | |
| | *Xylorhiza tortifolia* | 33 | 0.5 | 0.1 | 0.1 | 0.2 | | | | |
| | *Atriplex hymenelytra* | 27 | 2.2 | 0.4 | 0.2 | 5.0 | | | | |
| | *Opuntia basilaris* | 27 | 0.4 | 0.0 | 0.1 | 0.2 | | | | |
| | *Senna armata* | 20 | 1.4 | 0.2 | 0.2 | 2.0 | | | | |
| | *Ephedra funerea* | 20 | 1.4 | 0.2 | 0.5 | 1.0 | | | | |
| | *Atriplex confertifolia* | 20 | 1.6 | 0.1 | 0.2 | 1.0 | | | | |
| | *Grayia spinosa* | 20 | 0.4 | 0.1 | 0.1 | 0.5 | | | | |

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | |
| *Eriogonum inflatum* | 67 | 12.6 | 0.2 | 0.1 | 0.5 | | | | X |
| *Camissonia* | 47 | 3.7 | 0.1 | 0.1 | 0.7 | | | | |
| *Chaenactis* | 47 | 3.3 | 0.1 | 0.1 | 0.4 | | | | |
| *Bromus rubens* | 40 | 4.3 | 0.2 | 0.1 | 1.0 | | | | |
| *Chorizanthe rigida* | 40 | 2.9 | 0.1 | 0.1 | 0.2 | | | | |
| *Amsinckia* | 33 | 2.4 | 0.1 | 0.1 | 1.0 | | | | |
| *Cryptantha* | 33 | 2.7 | 0.1 | 0.1 | 0.4 | | | | |
| *Gilia* | 33 | 1.5 | 0.1 | 0.1 | 0.2 | | | | |
| *Plantago ovata* | 27 | 3.8 | 0.4 | 0.1 | 5.0 | | | | |
| *Schismus* | 27 | 9.7 | 0.4 | 0.5 | 2.0 | | | | |
| *Cuscuta* | 27 | 1.9 | 0.1 | 0.2 | 0.5 | | | | |
| *Chorizanthe brevicornu* | 27 | 1.9 | 0.0 | 0.1 | 0.2 | | | | |
| *Mirabilis* | 20 | 3.5 | 0.1 | 0.2 | 0.5 | | | | |
| *Monoptilon* | 20 | 1.1 | 0.1 | 0.2 | 0.5 | | | | |
| *Nemacladus* | 20 | 0.8 | 0.0 | 0.2 | 0.2 | | | | |
| *Rafinesquia neomexicana* | 20 | 0.7 | 0.0 | 0.1 | 0.2 | | | | |
| *Eriastrum* | 20 | 0.9 | 0.0 | 0.1 | 0.2 | | | | |
| *Phacelia* | 20 | 0.9 | 0.0 | 0.1 | 0.2 | | | | |
| *Oxytheca perfoliata* | 20 | 1.2 | 0.0 | 0.1 | 0.2 | | | | |
| *Eschscholzia* | 20 | 0.6 | 0.0 | 0.1 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | |
| Cryptogammic crust | 27 | 26.7 | 0.2 | 0.2 | 2.0 | | | | |

## *Larrea tridentata – Ambrosia dumosa – Atriplex confertifolia* Association

**Common Name:** Creosote Bush – White Bursage – Shadscale Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1122 m, Range 680 – 1608 m
Slope: Mean 14°, Range 0 – 30°
Aspect: Variable

Tree Cover: Mean 0.1%, Range 0 – 1%
Shrub Cover: Mean 11.9%, Range 2 – 50%
Herb Cover: Mean 5.3%, Range 0 – 14%

**Surface Covers:**
Large Rock: Mean 8.3%, Range 0.0 –43%
Small Rock: Mean 69.4%, Range 0 – 100%
Fines: Mean 18.1%, Range 0 – 78%
Litter: Mean 0.7%, Range 0 – 6%

**Surveys Used in Description (N = 53):** DEVA0666, DEVA9120, DEVA9310, DEVA9338, DEVA9359, DEVA9419, DEVA9452, DEVA9511, DEVA9640, DEVA9647, DEVAD002, DEVAD010, DEVAD019, DEVAD031, DEVAD032, DEVAD063, DEVAD067, DEVAD222, DEVAS062, DEVAS066, DEVAS069, DEVAS123, MOJC0172, MOJC0362, MOJC0376, MOJC0417, MOJC0456, MOJC0457, MOJC0544, MOJC0545, MOJC0546, MOJC0558, MOJC0570, MOJC0614, MOJC0615, MOJC0642, MOJC0647, MOJC0653, MOJC0656, MOJC0687, MOJC0688, MOJC0710, MOJC0960, MOJC1019, MOJC1042, MOJC1104, MOJC1171, MOJC1172, MOJC1173, SLTN0617, SLTN0728, SLTN0979, SLTN1103

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ambrosia dumosa* | 100 | 36.7 | 6.3 | 0.5 | 15.0 | X | | X | X |
| | *Larrea tridentata* | 100 | 30.0 | 5.5 | 0.5 | 35.0 | X | | X | X |
| | *Atriplex confertifolia* | 100 | 13.5 | 2.3 | 0.1 | 10.0 | X | | | X |
| | *Xylorhiza tortifolia* | 58 | 1.9 | 0.4 | 0.1 | 3.0 | | | | X |
| | *Echinocactus polycephalus* | 50 | 1.2 | 0.2 | 0.1 | 1.0 | | | | X |
| | *Opuntia basilaris* | 50 | 1.0 | 0.2 | 0.0 | 1.0 | | | | X |
| | *Lycium andersonii* | 38 | 2.7 | 0.4 | 0.1 | 3.0 | | | | |
| | *Stephanomeria pauciflora* | 31 | 0.9 | 0.1 | 0.1 | 0.5 | | | | |
| | *Eriogonum fasciculatum* | 23 | 1.2 | 0.2 | 0.1 | 5.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Eriogonum inflatum* | 81 | 23.1 | 0.3 | 0.0 | 3.0 | X | | | X |
| | *Bromus rubens* | 38 | 11.3 | 0.5 | 0.1 | 10.0 | | | | |
| | *Sphaeralcea ambigua* | 31 | 7.4 | 0.2 | 0.1 | 1.0 | | | | |
| | *Mirabilis laevis* | 25 | 4.3 | 0.1 | 0.1 | 0.5 | | | | |
| | *Chorizanthe rigida* | 21 | 2.4 | 0.0 | 0.1 | 0.2 | | | | |

## *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 – Baccharis salicifolia* | 1 | |
| *Lepidospartum squamatum* (alliance) | 1 | A4188 |
| *Lepidospartum squamatum* / desert ephemeral annuals | 8 | |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 878 m, Range 688 – 1119 m
Slope: Mean 3°, Range 1 – 6°
Aspect: Mostly east-facing

Tree Cover: Mean 0.5%, Range 0 – 3%
Shrub Cover: Mean 18.1%, Range 8 – 32%
Herb Cover: Mean 5.4%, Range 0 – 17%

**Surface Covers:**
Large Rock: Mean 5.6%, Range 0.0 –30%
Small Rock: Mean 31.7%, Range 5 – 66%
Fines: Mean 56.4%, Range 20 – 95%
Litter: Mean 5.0%, Range 0 – 15%

**Conservation Status Rank: Global** G3; **State (California)** S3

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | **7** | **2** | | | | | | |

**Surveys Used in Description (N = 10):** A1806051813, ALLF092, ALLF093, F1806051741, F1806060848, JAWB0040, JAWB0105, JAWB0119, TEHA0007, TEHA0012

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Lepidospartum squamatum* | 100 | 50.0 | 9.7 | 2.0 | 24.0 | **x** | | **x** | **x** |
| | *Hymenoclea salsola* | 90 | 15.5 | 2.6 | 0.2 | 7.0 | **x** | | | **x** |
| | *Cleome isomeris* | 50 | 3.6 | 0.7 | 0.2 | 3.0 | | | | **x** |
| | *Lepidium fremontii* | 40 | 1.3 | 0.2 | 0.2 | 1.0 | | | | |
| | *Ericameria paniculata* | 30 | 3.9 | 0.6 | 1.0 | 4.0 | | | | |
| | *Atriplex canescens* | 30 | 2.7 | 0.5 | 1.0 | 2.0 | | | | |
| | *Encelia actonii* | 30 | 1.0 | 0.1 | 0.2 | 1.0 | | | | |
| | *Salazaria mexicana* | 30 | 1.0 | 0.1 | 0.2 | 1.0 | | | | |
| | *Eriogonum fasciculatum* | 30 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Stephanomeria pauciflora* | 30 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Prunus fasciculata* | 20 | 1.5 | 0.4 | 0.2 | 4.0 | | | | |
| | *Atriplex polycarpa* | 20 | 2.1 | 0.2 | 0.2 | 2.0 | | | | |
| | *Gutierrezia microcephala* | 20 | 0.9 | 0.1 | 0.2 | 1.0 | | | | |
| | *Larrea tridentata* | 20 | 1.1 | 0.1 | 0.2 | 1.0 | | | | |
| | *Salvia dorrii* | 20 | 0.3 | 0.0 | 0.2 | 0.2 | | | | |
| | *Encelia virginensis* | 20 | 0.3 | 0.0 | 0.2 | 0.2 | | | | |
| | *Eriogonum heermannii* | 20 | 0.3 | 0.0 | 0.2 | 0.2 | | | | |
| | *Ericameria linearifolia* | 20 | 0.2 | 0.0 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 100 | 32.7 | 3.0 | 0.2 | 7.0 | **x** | | **x** | **x** |
| | *Amsinckia* | 80 | 2.9 | 0.3 | 0.2 | 1.0 | **x** | | | **x** |
| | *Schismus* | 60 | 19.9 | 3.2 | 0.2 | 15.0 | | | | **x** |
| | *Erodium cicutarium* | 60 | 6.6 | 0.6 | 0.2 | 3.0 | | | | **x** |
| | *Bromus tectorum* | 40 | 1.9 | 0.2 | 0.2 | 1.0 | | | | |
| | *Chorizanthe brevicornu* | 30 | 1.3 | 0.2 | 0.2 | 1.0 | | | | |
| | *Logfia californica* | 20 | 4.5 | 2.1 | 8.0 | 13.0 | | | | |
| | *Cryptantha circumscissa* | 20 | 2.0 | 1.0 | 1.0 | 9.0 | | | | |
| | *Chaenactis fremontii* | 20 | 1.6 | 0.8 | 2.0 | 6.0 | | | | |
| | *Malacothrix glabrata* | 20 | 0.4 | 0.2 | 1.0 | 1.0 | | | | |
| | *Phacelia tanacetifolia* | 20 | 0.4 | 0.2 | 1.0 | 1.0 | | | | |
| | *Descurainia pinnata* | 20 | 0.4 | 0.2 | 1.0 | 1.0 | | | | |
| | *Coreopsis bigelovii* | 20 | 0.4 | 0.2 | 1.0 | 1.0 | | | | |
| | *Mentzelia nitens* | 20 | 0.4 | 0.2 | 1.0 | 1.0 | | | | |
| | *Chamaesyce albomarginata* | 20 | 2.6 | 0.1 | 0.2 | 1.0 | | | | |
| | *Achnatherum speciosum* | 20 | 1.0 | 0.1 | 0.2 | 1.0 | | | | |
| | *Salvia columbariae* | 20 | 1.1 | 0.1 | 0.2 | 1.0 | | | | |
| | *Eschscholzia minutiflora* | 20 | 1.1 | 0.1 | 0.2 | 1.0 | | | | |
| | *Sisymbrium* | 20 | 1.7 | 0.1 | 0.2 | 1.0 | | | | |
| | *Cryptantha* | 20 | 0.9 | 0.0 | 0.2 | 0.2 | | | | |

## *Lepidospartum squamatum – Baccharis salicifolia* Association

**Common Name:** Scalebroom – Mulefat Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: 911 m
Slope: 1°
Aspect: Northeast-facing

Tree Cover: 0%
Shrub Cover: 15%
Herb Cover: 12%

**Surface Covers:**
Large Rock: 1.4%
Small Rock: 38%
Fines: 50%
Litter: 10%

**Surveys Used in Description (N = 1):** JAWB0105

**Association Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria paniculata* | 100 | 27.4 | 4.0 | 4.0 | 4.0 | X | | | X |
| | *Baccharis sergiloides* | 100 | 20.5 | 3.0 | 3.0 | 3.0 | X | | | X |
| | *Atriplex canescens* | 100 | 13.7 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Lepidospartum squamatum* | 100 | 13.7 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Baccharis salicifolia* | 100 | 6.8 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Tamarix ramosissima* | 100 | 6.8 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Gutierrezia microcephala* | 100 | 6.8 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Lepidium fremontii* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Hymenoclea salsola* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Eriogonum fasciculatum* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 100 | 43.1 | 5.0 | 5.0 | 5.0 | X | | X | X |
| | *Heliotropium curassavicum* | 100 | 17.2 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Schismus* | 100 | 8.6 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Erodium cicutarium* | 100 | 8.6 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Bromus tectorum* | 100 | 8.6 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Sisymbrium* | 100 | 8.6 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Amsinckia* | 100 | 1.7 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Nicotiana quadrivalvis* | 100 | 1.7 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Salsola* | 100 | 1.7 | 0.2 | 0.2 | 0.2 | X | | | X |

## *Lepidospartum squamatum* / desert ephemeral annuals Association

**Common Name:** Scalebroom / desert ephemeral annuals Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 866 m, Range 688 – 1119 m
Slope: Mean 3°, Range 1 – 6°
Aspect: Variable

Tree Cover: Mean 0.1%, Range 0 – 1%
Shrub Cover: Mean 16.8%, Range 8 – 30%
Herb Cover: Mean 4.6%, Range 0 – 17%

**Surface Covers:**
Large Rock: Mean 1.5%, Range 0.0 –4%
Small Rock: Mean 30.4%, Range 5 – 66%
Fines: Mean 65.0%, Range 30 – 95%
Litter: Mean 2.0%, Range 0 – 5%

**Surveys Used in Description (N = 8):** A1806051813, ALLF092, ALLF093, F1806051741, F1806060848, JAWB0119, TEHA0007, TEHA0012

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Lepidospartum squamatum* | 100 | 55.8 | 10.3 | 3.0 | 24.0 | X | X | | X |
| | *Hymenoclea salsola* | 100 | 19.3 | 3.2 | 0.2 | 7.0 | X | | | X |
| | *Cleome isomeris* | 63 | 4.4 | 0.9 | 0.2 | 3.0 | | | | X |
| | *Salazaria mexicana* | 38 | 1.3 | 0.2 | 0.2 | 1.0 | | | | |
| | *Encelia actonii* | 38 | 1.3 | 0.2 | 0.2 | 1.0 | | | | |
| | *Lepidium fremontii* | 38 | 1.4 | 0.2 | 0.2 | 1.0 | | | | |
| | *Stephanomeria pauciflora* | 38 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Prunus fasciculata* | 25 | 1.9 | 0.5 | 0.2 | 4.0 | | | | |
| | *Atriplex canescens* | 25 | 1.6 | 0.4 | 1.0 | 2.0 | | | | |
| | *Atriplex polycarpa* | 25 | 2.6 | 0.3 | 0.2 | 2.0 | | | | |
| | *Ericameria paniculata* | 25 | 1.5 | 0.3 | 1.0 | 1.0 | | | | |
| | *Larrea tridentata* | 25 | 1.3 | 0.2 | 0.2 | 1.0 | | | | |
| | *Salvia dorrii* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum fasciculatum* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum heermannii* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Encelia virginensis* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 100 | 30.1 | 2.9 | 0.2 | 7.0 | X | | X | X |
| | *Amsinckia* | 75 | 2.8 | 0.4 | 0.2 | 1.0 | X | | | X |
| | *Schismus* | 63 | 23.7 | 3.9 | 0.2 | 15.0 | | | | X |
| | *Erodium cicutarium* | 63 | 7.2 | 0.7 | 0.2 | 3.0 | | | | X |
| | *Chorizanthe brevicornu* | 38 | 1.6 | 0.3 | 0.2 | 1.0 | | | | |
| | *Bromus tectorum* | 38 | 1.3 | 0.2 | 0.2 | 1.0 | | | | |
| | *Logfia californica* | 25 | 5.6 | 2.6 | 8.0 | 13.0 | | | | |
| | *Cryptantha circumscissa* | 25 | 2.4 | 1.3 | 1.0 | 9.0 | | | | |
| | *Chaenactis fremontii* | 25 | 2.1 | 1.0 | 2.0 | 6.0 | | | | |
| | *Malacothrix glabrata* | 25 | 0.6 | 0.3 | 1.0 | 1.0 | | | | |
| | *Phacelia tanacetifolia* | 25 | 0.6 | 0.3 | 1.0 | 1.0 | | | | |
| | *Mentzelia nitens* | 25 | 0.6 | 0.3 | 1.0 | 1.0 | | | | |
| | *Coreopsis bigelovii* | 25 | 0.6 | 0.3 | 1.0 | 1.0 | | | | |
| | *Descurainia pinnata* | 25 | 0.6 | 0.3 | 1.0 | 1.0 | | | | |
| | *Salvia columbariae* | 25 | 1.4 | 0.2 | 0.2 | 1.0 | | | | |
| | *Achnatherum speciosum* | 25 | 1.2 | 0.2 | 0.2 | 1.0 | | | | |
| | *Eschscholzia minutiflora* | 25 | 1.4 | 0.2 | 0.2 | 1.0 | | | | |
| | *Cryptantha* | 25 | 1.1 | 0.1 | 0.2 | 0.2 | | | | |

## *Menodora spinescens* Shrubland Alliance

**Common Name:** Spiny menodora scrub

**NVC Alliance Code:** A2515. *Menodora spinescens* Scrub Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Menodora spinescens – (Ephedra nevadensis)* | 40 | CEGL002767 |
| *Menodora spinescens – Atriplex confertifolia* | 17 | CEGL005769 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1577 m, Range 1169 – 2097 m
Slope: Mean 8°, Range 0 – 29°
Aspect: Variable, but mostly east-facing

Tree Cover: Mean 0.1%, Range 0 – 2%
Shrub Cover: Mean 17.0%, Range 2 – 80%
Herb Cover: Mean 5.2%, Range 0 – 21%

**Surface Covers:**
Large Rock: Mean 6.1%, Range 0.0 –63%
Small Rock: Mean 69.9%, Range 0 – 97%
Fines: Mean 10.3%, Range 0 – 73%
Litter: Mean 3.3%, Range 0 – 20%

**Conservation Status Rank: Global** G4; **State (California)** S3

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | **1** | **15** | **3** | **2** | | **36** |

**Surveys Used in Description (N = 57):** DEVA0140, DEVA0205, DEVA0389, DEVA0508, DEVA0586, DEVA0611, DEVA0912, DEVA9196, DEVA9199, DEVA9250, DEVA9262, DEVA9335, DEVA9343, DEVA9345, DEVA9346, DEVA9372, DEVA9398, DEVA9507, DEVA9510, DEVA9521, DEVA9522, DEVA9549, DEVAD156, DEVAS068, DEVAS098, DEVAS100, DEVAS111, DEVAS112, DEVAS122, DEVAS233, FIR1211061226, FIR1211061536, FIR1211061629, MOJC0043, MOJC0173, MOJC0174, MOJC0335, MOJC0337, MOJC0835, MOJC0836, MOJC1077, MOJC1078, MOJC1093, OWVA0044, SLTN0246, SLTN0544, SLTN0555, SLTN0608, SLTN0624, SLTN0714, SLTN0721, SLTN0741, SLTN0746, SLTN0796, SLTN1040, SLTN1108, SLTN1140

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Menodora spinescens* | 100 | 40.5 | 7.9 | 1.0 | 45.0 | **x** | | **x** | **x** |
| | *Ephedra nevadensis* | 81 | 8.7 | 1.5 | 0.1 | 6.0 | **x** | | | **x** |
| | *Lycium andersonii* | 70 | 4.5 | 0.8 | 0.1 | 5.0 | | | | **x** |
| | *Krascheninnikovia lanata* | 56 | 1.6 | 0.3 | 0.0 | 2.0 | | | | **x** |
| | *Atriplex confertifolia* | 54 | 5.6 | 0.8 | 0.1 | 6.0 | | | | **x** |
| | *Hymenoclea salsola* | 53 | 2.4 | 0.5 | 0.0 | 5.0 | | | | **x** |
| | *Grayia spinosa* | 46 | 3.2 | 0.7 | 0.1 | 7.0 | | | | |
| | *Xylorhiza tortifolia* | 40 | 0.7 | 0.1 | 0.1 | 1.0 | | | | |
| | *Psorothamnus arborescens* | 39 | 1.8 | 0.3 | 0.2 | 2.0 | | | | |
| | *Tetradymia axillaris* | 35 | 1.5 | 0.2 | 0.1 | 4.0 | | | | |
| | *Ericameria cooperi* | 32 | 2.8 | 0.6 | 0.1 | 8.0 | | | | |
| | *Picrothamnus desertorum* | 30 | 1.3 | 0.2 | 0.1 | 4.0 | | | | |
| | *Larrea tridentata* | 28 | 3.2 | 0.4 | 0.0 | 4.0 | | | | |
| | *Coleogyne ramosissima* | 23 | 3.0 | 0.8 | 0.0 | 15.0 | | | | |
| | *Atriplex canescens* | 23 | 1.2 | 0.2 | 0.1 | 3.0 | | | | |
| | *Lepidium fremontii* | 21 | 0.6 | 0.1 | 0.1 | 1.0 | | | | |
| | *Thamnosma montana* | 21 | 0.4 | 0.1 | 0.1 | 0.5 | | | | |
| **Herb** | | | | | | | | | | |
| | *Sphaeralcea ambigua* | 53 | 6.6 | 0.1 | 0.1 | 0.5 | | | | **x** |
| | *Bromus rubens* | 49 | 11.6 | 0.7 | 0.1 | 5.0 | | | | |
| | *Eriogonum inflatum* | 47 | 5.0 | 0.1 | 0.0 | 0.5 | | | | |
| | *Achnatherum speciosum* | 37 | 5.0 | 0.2 | 0.1 | 2.0 | | | | |
| | *Chaenactis* | 35 | 4.2 | 0.3 | 0.1 | 7.0 | | | | |
| | *Oxytheca perfoliata* | 35 | 4.0 | 0.1 | 0.1 | 1.0 | | | | |
| | *Amsinckia* | 33 | 3.9 | 0.2 | 0.0 | 3.0 | | | | |
| | *Cryptantha* | 33 | 2.3 | 0.1 | 0.1 | 2.0 | | | | |
| | *Achnatherum hymenoides* | 32 | 3.4 | 0.2 | 0.1 | 7.0 | | | | |
| | *Gilia* | 28 | 1.2 | 0.0 | 0.1 | 0.2 | | | | |
| | *Stanleya* | 26 | 2.1 | 0.1 | 0.0 | 0.5 | | | | |
| | *Eriogonum nidularium* | 26 | 1.2 | 0.1 | 0.1 | 0.5 | | | | |
| | *Phacelia vallis-mortae* | 23 | 1.4 | 0.1 | 0.2 | 1.0 | | | | |
| | *Camissonia* | 23 | 1.0 | 0.0 | 0.1 | 0.2 | | | | |
| | *Eriogonum* | 21 | 1.6 | 0.1 | 0.1 | 1.0 | | | | |
| | *Elymus elymoides* | 21 | 1.5 | 0.1 | 0.1 | 1.0 | | | | |
| | *Astragalus* | 21 | 1.7 | 0.0 | 0.1 | 0.5 | | | | |
| | *Eriastrum* | 21 | 1.1 | 0.0 | 0.1 | 1.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Menodora spinescens – (Ephedra nevadensis)* Association

**Common Name:** Spiny Menodora – (Nevada Ephedra) Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1573 m, Range 1169 – 2097 m
Slope: Mean 8°, Range 0 – 29°
Aspect: Mostly east-facing, but variable

Tree Cover: Mean 0.1%, Range 0 – 1%
Shrub Cover: Mean 18.5%, Range 4 – 80%
Herb Cover: Mean 5.5%, Range 0 – 21%

**Surface Covers:**
Large Rock: Mean 7.3%, Range 0.0 –63%
Small Rock: Mean 69.8%, Range 0 – 96%
Fines: Mean 10.2%, Range 0 – 73%
Litter: Mean 3.5%, Range 0 – 20%

**Surveys Used in Description (N = 40):** DEVA0205, DEVA0389, DEVA0508, DEVA0586, DEVA0611, DEVA0912, DEVA9196, DEVA9199, DEVA9335, DEVA9343, DEVA9345, DEVA9346, DEVA9372, DEVA9398, DEVA9507, DEVA9510, DEVA9521, DEVA9522, DEVA9549, DEVAD156, DEVAS068, DEVAS111, DEVAS112, FIR1211061226, MOJC0043, MOJC0173, MOJC0335, MOJC1077, MOJC1078, OWVA0044, SLTN0246, SLTN0544, SLTN0555, SLTN0608, SLTN0624, SLTN0741, SLTN0746, SLTN0796, SLTN1040, SLTN1108

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Menodora spinescens* | 100 | 36.3 | 7.9 | 1.0 | 45.0 | X | | X | X |
| | *Ephedra nevadensis* | 83 | 11.0 | 1.9 | 0.1 | 6.0 | X | | | X |
| | *Lycium andersonii* | 68 | 4.1 | 0.8 | 0.1 | 5.0 | | | | X |
| | *Hymenoclea salsola* | 59 | 2.9 | 0.6 | 0.0 | 5.0 | | | | X |
| | *Grayia spinosa* | 56 | 4.2 | 0.9 | 0.1 | 7.0 | | | | X |
| | *Krascheninnikovia lanata* | 54 | 1.3 | 0.2 | 0.0 | 2.0 | | | | X |
| | *Ericameria cooperi* | 41 | 3.6 | 0.8 | 0.1 | 8.0 | | | | |
| | *Xylorhiza tortifolia* | 41 | 0.7 | 0.1 | 0.1 | 1.0 | | | | |
| | *Atriplex confertifolia* | 37 | 2.0 | 0.3 | 0.1 | 3.0 | | | | |
| | *Larrea tridentata* | 34 | 4.1 | 0.6 | 0.0 | 4.0 | | | | |
| | *Atriplex canescens* | 32 | 1.7 | 0.3 | 0.1 | 3.0 | | | | |
| | *Tetradymia axillaris* | 29 | 0.7 | 0.2 | 0.1 | 4.0 | | | | |
| | *Eriogonum fasciculatum* | 27 | 1.8 | 0.3 | 0.1 | 5.0 | | | | |
| | *Picrothamnus desertorum* | 27 | 1.4 | 0.3 | 0.1 | 4.0 | | | | |
| | *Psorothamnus arborescens* | 27 | 1.0 | 0.2 | 0.2 | 2.0 | | | | |
| | *Thamnosma montana* | 27 | 0.5 | 0.1 | 0.2 | 0.5 | | | | |
| | *Ambrosia dumosa* | 22 | 3.2 | 1.2 | 0.1 | 35.0 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 51 | 12.6 | 0.8 | 0.1 | 5.0 | | | | X |
| | *Sphaeralcea ambigua* | 49 | 5.3 | 0.1 | 0.1 | 0.5 | | | | |
| | *Achnatherum speciosum* | 46 | 6.5 | 0.2 | 0.1 | 2.0 | | | | |
| | *Eriogonum inflatum* | 44 | 4.1 | 0.1 | 0.0 | 0.5 | | | | |
| | *Amsinckia* | 41 | 5.2 | 0.3 | 0.0 | 3.0 | | | | |
| | *Chaenactis* | 39 | 5.1 | 0.4 | 0.1 | 7.0 | | | | |
| | *Cryptantha* | 39 | 2.7 | 0.1 | 0.1 | 2.0 | | | | |
| | *Oxytheca perfoliata* | 37 | 3.8 | 0.1 | 0.1 | 1.0 | | | | |
| | *Achnatherum hymenoides* | 32 | 3.9 | 0.3 | 0.1 | 7.0 | | | | |
| | *Eriogonum nidularium* | 29 | 1.3 | 0.1 | 0.1 | 0.5 | | | | |
| | *Gilia* | 29 | 1.0 | 0.0 | 0.1 | 0.2 | | | | |
| | *Phacelia vallis-mortae* | 27 | 1.8 | 0.1 | 0.2 | 1.0 | | | | |
| | *Phacelia* | 24 | 2.3 | 0.2 | 0.1 | 5.0 | | | | |
| | *Stanleya* | 24 | 1.7 | 0.0 | 0.0 | 0.5 | | | | |
| | *Eriastrum* | 24 | 0.9 | 0.0 | 0.1 | 0.2 | | | | |
| | *Pleuraphis jamesii* | 22 | 4.1 | 0.2 | 0.1 | 5.0 | | | | |

## *Menodora spinescens – Atriplex confertifolia* Association

**Common Name:** Spiny Menodora – Shadscale Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1590 m, Range 1338 – 1921 m
Slope: Mean 8°, Range 2 – 20°
Aspect: Mostly south-facing, but variable

Tree Cover: Mean 0.2%, Range 0 – 2%
Shrub Cover: Mean 13.3%, Range 2 – 40%
Herb Cover: Mean 4.4%, Range 0 – 14%

**Surface Covers:**
Large Rock: Mean 2.7%, Range 0.0 –15%
Small Rock: Mean 70.0%, Range 8 – 97%
Fines: Mean 10.4%, Range 0 – 38%
Litter: Mean 2.7%, Range 0 – 17%

**Surveys Used in Description (N = 17):** DEVA0140, DEVA9250, DEVA9262, DEVAS098, DEVAS100, DEVAS122, DEVAS233, FIR1211061536, FIR1211061629, MOJC0174, MOJC0337, MOJC0835, MOJC0836, MOJC1093, SLTN0714, SLTN0721, SLTN1140

### Association Stand Table:

| Taxon | Con | RelCov | Avg | Min | Max | Char | Dom | cDom | Often |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Yucca brevifolia* | 25 | 25.0 | 0.2 | 0.2 | 1.5 | | | | |
| **Shrub** | | | | | | | | | |
| *Menodora spinescens* | 100 | 51.3 | 7.9 | 3.0 | 25.0 | X | X | | X |
| *Atriplex confertifolia* | 100 | 14.7 | 2.0 | 0.1 | 6.0 | X | | | X |
| *Lycium andersonii* | 75 | 5.5 | 0.8 | 0.1 | 3.0 | X | | | X |
| *Ephedra nevadensis* | 75 | 3.0 | 0.5 | 0.1 | 2.0 | X | | | X |
| *Psorothamnus arborescens* | 69 | 3.7 | 0.5 | 0.2 | 2.0 | | | | X |
| *Krascheninnikovia lanata* | 63 | 2.3 | 0.4 | 0.2 | 2.0 | | | | X |
| *Tetradymia axillaris* | 50 | 3.5 | 0.4 | 0.2 | 2.0 | | | | X |
| *Hymenoclea salsola* | 38 | 1.1 | 0.2 | 0.1 | 1.5 | | | | |
| *Picrothamnus desertorum* | 38 | 1.1 | 0.2 | 0.1 | 1.0 | | | | |
| *Xylorhiza tortifolia* | 38 | 0.6 | 0.1 | 0.1 | 0.5 | | | | |
| *Coleogyne ramosissima* | 31 | 3.4 | 0.8 | 0.5 | 5.0 | | | | |
| *Lepidium fremontii* | 25 | 0.9 | 0.1 | 0.1 | 1.0 | | | | |
| **Herb** | | | | | | | | | |
| *Sphaeralcea ambigua* | 63 | 9.7 | 0.2 | 0.1 | 0.5 | | | | X |
| *Eriogonum inflatum* | 56 | 7.2 | 0.1 | 0.1 | 0.5 | | | | X |
| *Bromus rubens* | 44 | 8.9 | 0.4 | 0.2 | 4.0 | | | | |
| *Oxytheca perfoliata* | 31 | 4.5 | 0.2 | 0.1 | 1.0 | | | | |
| *Stanleya* | 31 | 3.1 | 0.1 | 0.1 | 0.5 | | | | |
| *Eriogonum* | 31 | 3.6 | 0.1 | 0.1 | 0.5 | | | | |
| *Achnatherum hymenoides* | 31 | 2.1 | 0.1 | 0.1 | 0.2 | | | | |
| *Camissonia* | 31 | 2.3 | 0.0 | 0.1 | 0.2 | | | | |
| Forb (herbaceous, not grass nor grasslike) | 25 | 7.1 | 0.2 | 0.1 | 2.0 | | | | |
| *Elymus elymoides* | 25 | 2.6 | 0.1 | 0.2 | 0.5 | | | | |
| *Astragalus* | 25 | 2.3 | 0.0 | 0.1 | 0.2 | | | | |
| *Chaenactis* | 25 | 2.0 | 0.0 | 0.1 | 0.2 | | | | |
| *Gilia* | 25 | 1.7 | 0.0 | 0.1 | 0.2 | | | | |

## *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 |
|---|---|---|
| *Salazaria mexicana* | 17 | CEGL005293 |
| *Prunus fasciculata* | 3 | CEGL002704 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1251 m, Range 764 – 1735 m
Slope: Mean 20°, Range 0 – 49°
Aspect: Variable

Tree Cover: Mean 0.2%, Range 0 – 1%
Shrub Cover: Mean 15.7%, Range 1 – 55%
Herb Cover: Mean 6.7%, Range 0 – 23%

**Surface Covers:**
Large Rock: Mean 22.2%, Range 0.0 –98%
Small Rock: Mean 48.4%, Range 1 – 95%
Fines: Mean 20.7%, Range 0 – 73%
Litter: Mean 3.0%, Range 0 – 40%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | **1** | **2** | | **5** | | | | **11** |

**Surveys Used in Description (N = 20):** DEVA9671, DEVA9802, DEVA9805, DEVAS201, JAWB0012, JAWB0120, MOJC0058, MOJC0361, MOJC0461, MOJC0466, MOJC0593, MOJC0759, MOJC0918, MOJC0955, SLTN0602, SLTN0614, SLTN0770, SLTN0976, SLTN1142, TEHA0010

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Salazaria mexicana* | 86 | 35.0 | 7.2 | 0.5 | 25.0 | **x** | | **x** | **x** |
| | *Eriogonum fasciculatum* | 73 | 6.5 | 1.1 | 0.2 | 5.0 | | | | **x** |
| | *Hymenoclea salsola* | 68 | 5.4 | 1.0 | 0.1 | 4.0 | | | | **x** |
| | *Ambrosia dumosa* | 64 | 2.4 | 0.4 | 0.1 | 1.5 | | | | **x** |
| | *Ephedra nevadensis* | 50 | 4.2 | 0.8 | 0.2 | 8.0 | | | | **x** |
| | *Larrea tridentata* | 45 | 5.0 | 1.2 | 0.1 | 15.0 | | | | |
| | *Stephanomeria pauciflora* | 45 | 1.2 | 0.2 | 0.1 | 1.0 | | | | |
| | *Viguiera reticulata* | 36 | 1.4 | 0.2 | 0.1 | 2.0 | | | | |
| | *Xylorhiza tortifolia* | 36 | 0.9 | 0.1 | 0.2 | 0.5 | | | | |
| | *Prunus fasciculata* | 32 | 7.0 | 2.3 | 0.1 | 40.0 | | | | |
| | *Gutierrezia microcephala* | 32 | 1.3 | 0.3 | 0.1 | 3.0 | | | | |
| | *Lycium andersonii* | 32 | 1.7 | 0.3 | 0.5 | 3.0 | | | | |
| | *Psorothamnus arborescens* | 32 | 1.7 | 0.3 | 0.1 | 1.5 | | | | |
| | *Encelia actonii* | 32 | 1.5 | 0.2 | 0.1 | 1.5 | | | | |
| | *Grayia spinosa* | 32 | 0.6 | 0.1 | 0.1 | 0.5 | | | | |
| | *Ericameria teretifolia* | 27 | 1.7 | 0.4 | 0.2 | 3.5 | | | | |
| | *Atriplex confertifolia* | 27 | 1.5 | 0.3 | 0.1 | 1.5 | | | | |
| | *Lepidium fremontii* | 27 | 1.0 | 0.1 | 0.2 | 1.0 | | | | |
| | *Opuntia basilaris* | 27 | 0.5 | 0.1 | 0.1 | 0.5 | | | | |
| | *Thamnosma montana* | 23 | 1.4 | 0.3 | 0.5 | 3.0 | | | | |
| | *Krascheninnikovia lanata* | 23 | 0.9 | 0.2 | 0.2 | 2.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 73 | 19.5 | 1.2 | 0.1 | 10.0 | | | | **x** |
| | *Eriogonum inflatum* | 73 | 8.2 | 0.3 | 0.1 | 0.5 | | | | **x** |
| | *Achnatherum speciosum* | 68 | 11.8 | 0.8 | 0.1 | 7.0 | | | | **x** |
| | *Sphaeralcea ambigua* | 45 | 4.8 | 0.2 | 0.1 | 1.0 | | | | |
| | *Mirabilis laevis* | 36 | 4.1 | 0.2 | 0.2 | 0.5 | | | | |
| | *Erodium cicutarium* | 32 | 2.4 | 0.1 | 0.1 | 0.5 | | | | |
| | *Eriogonum* | 27 | 3.9 | 0.1 | 0.1 | 1.0 | | | | |
| | *Cryptantha* | 27 | 1.5 | 0.1 | 0.1 | 0.5 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Prunus fasciculata* Association

**Common Name:** Desert Almond Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1107 m, Range 867 – 1350 m
Slope: Mean 20°, Range 0 – 49°
Aspect: Variable

Tree Cover: Mean 0.5%, Range 0 – 1%
Shrub Cover: Mean 21.3%, Range 4 – 55%
Herb Cover: Mean 9.2%, Range 1 – 23%

**Surface Covers:**
Large Rock: Mean 46.5%, Range 0.0 –72%
Small Rock: Mean 19.7%, Range 14 – 25%
Fines: Mean 18.3%, Range 10 – 33%
Litter: Mean 13.7%, Range 0 – 40%

**Surveys Used in Description (N = 3):** JAWB0012, JAWB0120, MOJC0918

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Yucca brevifolia* | 33 | 33.3 | 0.3 | 1.0 | 1.0 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Prunus fasciculata* | 100 | 43.7 | 15.2 | 2.5 | 40.0 | X | | X | X |
| | *Eriogonum heermannii* | 67 | 5.7 | 0.5 | 0.5 | 1.0 | | | | X |
| | *Ambrosia dumosa* | 67 | 3.1 | 0.4 | 0.2 | 1.0 | | | | X |
| | *Ephedra nevadensis* | 67 | 2.0 | 0.2 | 0.2 | 0.5 | | | | X |
| | *Stephanomeria pauciflora* | 67 | 2.0 | 0.2 | 0.2 | 0.5 | | | | X |
| | *Ericameria nauseosa* | 33 | 7.3 | 4.0 | 12.0 | 12.0 | | | | |
| | *Ephedra viridis* | 33 | 1.8 | 1.0 | 3.0 | 3.0 | | | | |
| | *Plant* | 33 | 4.4 | 0.7 | 2.0 | 2.0 | | | | |
| | *Brickellia desertorum* | 33 | 4.4 | 0.7 | 2.0 | 2.0 | | | | |
| | *Gutierrezia microcephala* | 33 | 2.2 | 0.3 | 1.0 | 1.0 | | | | |
| | *Atriplex confertifolia* | 33 | 2.2 | 0.3 | 1.0 | 1.0 | | | | |
| | *Encelia actonii* | 33 | 4.6 | 0.3 | 1.0 | 1.0 | | | | |
| | *Salvia mohavensis* | 33 | 2.2 | 0.3 | 1.0 | 1.0 | | | | |
| | *Ephedra funerea* | 33 | 1.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Thamnosma montana* | 33 | 1.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Krascheninnikovia lanata* | 33 | 1.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Brickellia atractyloides* | 33 | 1.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Echinocactus polycephalus* | 33 | 1.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Salvia funerea* | 33 | 1.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Lepidium fremontii* | 33 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Petalonyx nitidus* | 33 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cleome isomeris* | 33 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Hesperoyucca whipplei* | 33 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Senna armata* | 33 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum fasciculatum* | 33 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eucnide urens* | 33 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Ericameria teretifolia* | 33 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 67 | 6.9 | 1.0 | 1.0 | 2.0 | | | | X |
| | *Eriogonum inflatum* | 67 | 8.8 | 0.2 | 0.2 | 0.5 | | | | X |
| | *Achnatherum speciosum* | 67 | 8.8 | 0.2 | 0.2 | 0.5 | | | | X |
| | *Bromus tectorum* | 33 | 24.8 | 6.0 | 18.0 | 18.0 | | | | |
| | *Nicotiana quadrivalvis* | 33 | 1.4 | 0.3 | 1.0 | 1.0 | | | | |
| | *Phacelia fremontii* | 33 | 1.4 | 0.3 | 1.0 | 1.0 | | | | |
| | *Cryptantha circumscissa* | 33 | 1.4 | 0.3 | 1.0 | 1.0 | | | | |
| | *Camissonia brevipes* | 33 | 2.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Mentzelia* | 33 | 2.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Physalis crassifolia* | 33 | 2.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Delphinium* | 33 | 2.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Cryptantha* | 33 | 2.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Cheilanthes parryi* | 33 | 2.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Astragalus* | 33 | 2.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Arenaria* | 33 | 2.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Aristida purpurea* | 33 | 2.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Sphaeralcea ambigua* | 33 | 2.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Physalis* | 33 | 2.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Penstemon* | 33 | 2.1 | 0.2 | 0.5 | 0.5 | | | | |
| | *Mirabilis laevis* | 33 | 6.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Chamaesyce vallis-mortae* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum baileyi* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Mentzelia albicaulis* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Schismus* | 33 | 6.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Erodium cicutarium* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriophyllum* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Salvia columbariae* | 33 | 6.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Phacelia cicutaria* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |

## *Salazaria mexicana* Association

**Common Name:** Bladder Sage Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1273 m, Range 764 – 1735 m
Slope: Mean 20°, Range 2 – 48°
Aspect: Variable

Tree Cover: Mean 0.2%, Range 0 – 1%
Shrub Cover: Mean 14.8%, Range 1 – 45%
Herb Cover: Mean 6.3%, Range 0 – 21%

**Surface Covers:**
Large Rock: Mean 18.3%, Range 0.1 –98%
Small Rock: Mean 53.0%, Range 1 – 95%
Fines: Mean 21.1%, Range 0 – 73%
Litter: Mean 1.3%, Range 0 – 12%

**Surveys Used in Description (N = 17):** DEVA9671, DEVA9802, DEVA9805, DEVAS201, MOJC0058, MOJC0361, MOJC0461, MOJC0466, MOJC0593, MOJC0759, MOJC0955, SLTN0602, SLTN0614, SLTN0770, SLTN0976, SLTN1142, TEHA0010

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Salazaria mexicana* | 100 | 40.5 | 8.3 | 0.5 | 25.0 | X | | X | X |
| | *Eriogonum fasciculatum* | 79 | 7.4 | 1.2 | 0.2 | 5.0 | X | | | X |
| | *Hymenoclea salsola* | 79 | 6.2 | 1.1 | 0.1 | 4.0 | X | | | X |
| | *Ambrosia dumosa* | 63 | 2.3 | 0.3 | 0.1 | 1.5 | | | | X |
| | *Larrea tridentata* | 53 | 5.8 | 1.4 | 0.1 | 15.0 | | | | X |
| | *Ephedra nevadensis* | 47 | 4.5 | 0.9 | 0.2 | 8.0 | | | | |
| | *Viguiera reticulata* | 42 | 1.6 | 0.3 | 0.1 | 2.0 | | | | |
| | *Stephanomeria pauciflora* | 42 | 1.1 | 0.2 | 0.1 | 1.0 | | | | |
| | *Xylorhiza tortifolia* | 42 | 1.0 | 0.2 | 0.2 | 0.5 | | | | |
| | *Lycium andersonii* | 37 | 2.0 | 0.4 | 0.5 | 3.0 | | | | |
| | *Psorothamnus arborescens* | 37 | 1.9 | 0.3 | 0.1 | 1.5 | | | | |
| | *Grayia spinosa* | 37 | 0.7 | 0.1 | 0.1 | 0.5 | | | | |
| | *Gutierrezia microcephala* | 32 | 1.2 | 0.3 | 0.1 | 3.0 | | | | |
| | *Encelia actonii* | 32 | 1.0 | 0.2 | 0.1 | 1.5 | | | | |
| | *Opuntia basilaris* | 32 | 0.6 | 0.1 | 0.1 | 0.5 | | | | |
| | *Ericameria teretifolia* | 26 | 1.8 | 0.4 | 0.5 | 3.5 | | | | |
| | *Atriplex confertifolia* | 26 | 1.4 | 0.3 | 0.1 | 1.5 | | | | |
| | *Lepidium fremontii* | 26 | 1.0 | 0.2 | 0.2 | 1.0 | | | | |
| | *Thamnosma montana* | 21 | 1.4 | 0.3 | 0.5 | 3.0 | | | | |
| | *Prunus fasciculata* | 21 | 1.2 | 0.2 | 0.1 | 4.0 | | | | |
| | *Atriplex canescens* | 21 | 1.0 | 0.2 | 0.2 | 1.5 | | | | |
| | *Krascheninnikovia lanata* | 21 | 0.9 | 0.2 | 0.2 | 2.0 | | | | |
| | *Encelia farinosa* | 21 | 0.6 | 0.1 | 0.5 | 1.0 | | | | |
| | *Ericameria cooperi* | 21 | 0.5 | 0.1 | 0.2 | 0.5 | | | | |
| | *Tetradymia axillaris* | 21 | 0.2 | 0.0 | 0.1 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 74 | 21.5 | 1.2 | 0.1 | 10.0 | | | | X |
| | *Eriogonum inflatum* | 74 | 8.2 | 0.3 | 0.1 | 0.5 | | | | X |
| | *Achnatherum speciosum* | 68 | 12.3 | 0.8 | 0.1 | 7.0 | | | | X |
| | *Sphaeralcea ambigua* | 47 | 5.2 | 0.2 | 0.1 | 1.0 | | | | |
| | *Mirabilis laevis* | 37 | 3.7 | 0.2 | 0.2 | 0.5 | | | | |
| | *Eriogonum* | 32 | 4.5 | 0.1 | 0.1 | 1.0 | | | | |
| | *Erodium cicutarium* | 32 | 2.7 | 0.1 | 0.1 | 0.5 | | | | |
| | *Cryptantha* | 26 | 1.4 | 0.1 | 0.1 | 0.5 | | | | |
| | *Stanleya* | 21 | 2.5 | 0.1 | 0.2 | 1.0 | | | | |
| | *Amsinckia* | 21 | 1.4 | 0.0 | 0.1 | 0.2 | | | | |
| | *Chamaesyce albomarginata* | 21 | 0.5 | 0.0 | 0.1 | 0.1 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 21 | 14.9 | 0.1 | 0.2 | 1.0 | | | | |

## *Psorothamnus fremontii – Psorothamnus polydenius* Shrubland Alliance

**Common Name:** Fremont's smokebush – Nevada smokebush scrub

**NVC Alliance Code:** A4186. *Psorothamnus fremontii - Psorothamnus polydenius* Desert Wash Scrub Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Psorothamnus arborescens* | 6 | |
| *Psorothamnus arborescens – Atriplex confertifolia – Tetradymia* spp. | 17 | |
| *Psorothamnus polydenius – (Psorothamnus arborescens)* | 16 | |
| *Sarcobatus baileyi* | 2 | |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1320 m, Range 913 – 1716 m
Slope: Mean 9°, Range 0 – 36°
Aspect: Variable

Tree Cover: 0.0%
Shrub Cover: Mean 18.0%, Range 0 – 44%
Herb Cover: Mean 10.5%, Range 1 – 60%

**Surface Covers:**
Large Rock: Mean 7.1%, Range 0.0 –80%
Small Rock: Mean 43.9%, Range 5 – 90%
Fines: Mean 32.9%, Range 0 – 92%
Litter: Mean 2.5%, Range 0 – 15%

**Conservation Status Rank: Global** G4?; **State (California)** S2S3

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | **1** | **8** | **2** | **13** | **12** | | **5** |

**Surveys Used in Description (N = 41):** DEVAS096, DEVAS207, FIR1211061314, FIR1211061439, FIR1211061502, FIR1211061558, FIR1211061615, FIR1306251738, FISH0003, FISH0011, FISH0012, FISH0053, FISH0058, FISH0073, OWVA0001, OWVA0002, OWVA0003, OWVA0004, OWVA0005, OWVA0007, OWVA0009, OWVA0029, OWVA0031, OWVA0040, OWVA0046, SLTN0527, SLTN0554, SLTN0615, SLTN0717, SLTN0724, SLTN0797, SLTN0933, SLTN1079, SLTN1080, SLTN1094, SLTN1104, SLTN1138, SLTN1150, SLTN1155, SLTN1207, ZOE1211071056

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Psorothamnus arborescens* | 78 | 25.8 | 5.3 | 0.2 | 25.0 | **x** | | | **x** |
| | *Psorothamnus polydenius* | 51 | 21.6 | 3.1 | 0.1 | 25.0 | | | | **x** |
| | *Ephedra nevadensis* | 49 | 4.5 | 1.1 | 0.1 | 10.0 | | | | |
| | *Atriplex confertifolia* | 41 | 10.0 | 1.7 | 0.1 | 15.0 | | | | |
| | *Atriplex canescens* | 41 | 11.2 | 1.6 | 0.2 | 15.0 | | | | |
| | *Tetradymia axillaris* | 29 | 2.4 | 0.6 | 0.1 | 12.0 | | | | |
| | *Hymenoclea salsola* | 22 | 3.5 | 0.8 | 0.1 | 8.0 | | | | |
| | *Krascheninnikovia lanata* | 22 | 1.6 | 0.4 | 0.1 | 5.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 34 | 6.9 | 0.4 | 0.1 | 7.0 | | | | |
| | *Amsinckia* | 34 | 3.8 | 0.3 | 0.1 | 4.0 | | | | |
| | *Eriogonum* | 29 | 6.9 | 0.9 | 0.1 | 30.0 | | | | |
| | *Salsola* | 27 | 7.3 | 0.5 | 0.1 | 10.0 | | | | |
| | *Chaenactis* | 27 | 2.5 | 0.3 | 0.1 | 5.0 | | | | |
| | *Eriogonum inflatum* | 24 | 6.7 | 1.5 | 0.1 | 35.0 | | | | |
| | *Bromus rubens* | 22 | 5.3 | 0.3 | 0.1 | 4.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Psorothamnus arborescens* Provisional Association

**Common Name:** Mojave Indigo Bush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1220 m, Range 913 – 1535 m
Slope: Mean 5°, Range 2 – 7°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 16.3%, Range 2 – 37%
Herb Cover: Mean 8.0%, Range 1 – 25%

**Surface Covers:**
Large Rock: Mean 11.7%, Range 0.0 –25%
Small Rock: Mean 54.0%, Range 6 – 90%
Fines: Mean 26.6%, Range 1 – 90%
Litter: Mean 1.9%, Range 0 – 8%

**Surveys Used in Description (N = 6):** DEVAS096, DEVAS207, OWVA0001, OWVA0004, SLTN0717, SLTN0797

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Psorothamnus arborescens* | 100 | 61.7 | 9.4 | 1.0 | 25.0 | X | X | | X |
| | *Hymenoclea salsola* | 50 | 16.7 | 3.2 | 5.0 | 8.0 | | | | X |
| | *Ephedra nevadensis* | 50 | 4.6 | 0.9 | 0.1 | 3.0 | | | | X |
| | *Larrea tridentata* | 33 | 9.6 | 0.8 | 1.0 | 3.5 | | | | |
| | *Stephanomeria pauciflora* | 33 | 1.0 | 0.4 | 0.1 | 2.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Eriogonum inflatum* | 50 | 9.8 | 0.4 | 0.1 | 1.0 | | | | X |
| | *Cryptantha* | 50 | 4.9 | 0.1 | 0.1 | 0.5 | | | | X |
| | *Amsinckia* | 33 | 2.2 | 0.5 | 0.1 | 3.0 | | | | |
| | *Eriogonum* | 33 | 17.3 | 0.5 | 1.0 | 2.0 | | | | |
| | *Chaenactis carphoclinia* | 33 | 0.8 | 0.2 | 0.1 | 1.0 | | | | |
| | *Phacelia* | 33 | 1.0 | 0.0 | 0.1 | 0.1 | | | | |
| | *Chaenactis* | 33 | 1.2 | 0.0 | 0.1 | 0.1 | | | | |

## *Psorothamnus arborescens – Atriplex confertifolia – Tetradymia* spp. Association

**Common Name:** Mojave Indigo Bush – Shadscale – Horsebrush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1320 m, Range 1172 – 1572 m
Slope: Mean 8°, Range 0 – 24°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 19.2%, Range 0 – 40%
Herb Cover: Mean 13.3%, Range 1 – 60%

**Surface Covers:**
Large Rock: Mean 10.7%, Range 0.0 –80%
Small Rock: Mean 45.1%, Range 5 – 90%
Fines: Mean 26.0%, Range 0 – 92%
Litter: Mean 2.3%, Range 0 – 15%

**Surveys Used in Description (N = 17):** FISH0012, FISH0073, OWVA0003, OWVA0005, OWVA0029, OWVA0031, OWVA0046, SLTN0527, SLTN0554, SLTN0615, SLTN0724, SLTN0933, SLTN1079, SLTN1094, SLTN1104, SLTN1155, ZOE1211071056

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Psorothamnus arborescens* | 100 | 32.9 | 7.6 | 0.2 | 20.0 | X | | X | X |
| | *Atriplex confertifolia* | 71 | 20.4 | 3.6 | 1.0 | 15.0 | | | | X |
| | *Ephedra nevadensis* | 59 | 4.0 | 0.8 | 0.1 | 4.0 | | | | X |
| | *Tetradymia axillaris* | 47 | 4.4 | 1.3 | 0.1 | 12.0 | | | | |
| | *Krascheninnikovia lanata* | 47 | 3.5 | 0.9 | 0.1 | 5.0 | | | | |
| | *Xylorhiza tortifolia* | 41 | 1.4 | 0.3 | 0.1 | 4.0 | | | | |
| | *Psorothamnus polydenius* | 35 | 4.4 | 0.5 | 0.1 | 4.0 | | | | |
| | *Atriplex canescens* | 29 | 6.0 | 1.3 | 0.2 | 10.0 | | | | |
| | *Tetradymia glabrata* | 29 | 6.0 | 0.7 | 1.0 | 5.0 | | | | |
| | *Sarcobatus vermiculatus* | 24 | 2.6 | 0.9 | 0.2 | 10.0 | | | | |
| | *Hymenoclea salsola* | 24 | 0.9 | 0.3 | 0.1 | 4.0 | | | | |
| | *Lycium andersonii* | 24 | 0.7 | 0.1 | 0.1 | 2.0 | | | | |
| | *Lepidium fremontii* | 24 | 0.7 | 0.1 | 0.1 | 1.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 47 | 9.5 | 0.5 | 0.1 | 7.0 | | | | |
| | *Amsinckia* | 35 | 2.5 | 0.1 | 0.1 | 1.0 | | | | |
| | *Eriogonum inflatum* | 29 | 11.8 | 3.5 | 0.1 | 35.0 | | | | |
| | *Chaenactis* | 29 | 2.3 | 0.3 | 0.1 | 5.0 | | | | |
| | *Malacothrix glabrata* | 29 | 4.9 | 0.2 | 0.1 | 2.0 | | | | |
| | *Bromus rubens* | 29 | 3.0 | 0.2 | 0.1 | 2.0 | | | | |

## *Psorothamnus polydenius – (Psorothamnus arborescens)* Association

**Common Name:** Dotted Dalea – (Mojave Indigo Bush) Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1361 m, Range 1163 – 1716 m
Slope: Mean 13°, Range 1 – 36°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 17.3%, Range 3 – 44%
Herb Cover: Mean 9.4%, Range 2 – 40%

**Surface Covers:**
Large Rock: Mean 0.3%, Range 0.0 –1%
Small Rock: Mean 39.0%, Range 22 – 71%
Fines: Mean 41.1%, Range 9 – 73%
Litter: Mean 3.2%, Range 0 – 9%

**Surveys Used in Description (N = 16):** FIR1211061314, FIR1211061439, FIR1211061502, FIR1211061558, FIR1211061615, FISH0003, FISH0011, FISH0053, FISH0058, OWVA0002, OWVA0007, OWVA0009, SLTN1080, SLTN1138, SLTN1150, SLTN1207

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | |
| *Psorothamnus polydenius* | 94 | 50.7 | 7.3 | 2.0 | 25.0 | X | X | | X |
| *Atriplex canescens* | 69 | 22.0 | 2.8 | 0.2 | 15.0 | | | | X |
| *Psorothamnus arborescens* | 44 | 6.1 | 1.6 | 0.2 | 15.0 | | | | |
| *Ephedra nevadensis* | 38 | 5.4 | 1.6 | 0.2 | 10.0 | | | | |
| **Herb** | | | | | | | | | |
| *Eriogonum* | 50 | 10.0 | 2.1 | 0.1 | 30.0 | | | | X |
| *Salsola* | 38 | 10.9 | 1.0 | 0.1 | 10.0 | | | | |
| *Amsinckia* | 38 | 6.2 | 0.5 | 0.1 | 4.0 | | | | |
| *Lessingia glandulifera* var. *glandulifera* | 38 | 13.0 | 0.2 | 0.2 | 1.0 | | | | |
| *Bromus tectorum* | 31 | 7.3 | 0.5 | 0.2 | 7.0 | | | | |
| *Eriogonum deflexum* | 25 | 8.7 | 0.2 | 0.2 | 3.0 | | | | |
| unknown Onagraceae | 25 | 1.4 | 0.2 | 0.1 | 1.0 | | | | |
| *Achnatherum hymenoides* | 25 | 3.5 | 0.2 | 0.2 | 1.0 | | | | |

## *Sarcobatus baileyi* Provisional Association

**Common Name:** Bailey's Greasewood Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1307 m, Range 1272 – 1342 m
Slope: no data
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 19.0%, Range 10 – 28%
Herb Cover: Mean 3.5%, Range 3 – 4%

**Surface Covers:**
Large Rock: 0%
Small Rock: 22%
Fines: 76%
Litter: 1%

**Surveys Used in Description (N = 2):** FIR1306251738, OWVA0040

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Sarcobatus baileyi* | 100 | 54.2 | 11.0 | 2.0 | 20.0 | X | X | | X |
| | *Psorothamnus arborescens* | 100 | 16.1 | 4.1 | 0.2 | 8.0 | X | | | X |
| | *Atriplex confertifolia* | 50 | 18.5 | 1.0 | 2.0 | 2.0 | | | | X |
| | *Tetradymia axillaris* | 50 | 9.3 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Ephedra nevadensis* | 50 | 1.9 | 0.1 | 0.2 | 0.2 | | | | X |
| **Herb** | | | | | | | | | | |
| | *Salsola* | 50 | 25.0 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Loeseliastrum depressum* | 50 | 5.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Mentzelia albicaulis* | 50 | 5.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Eriogonum inflatum* | 50 | 5.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Langloisia setosissima* | 50 | 5.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Chaenactis* | 50 | 5.0 | 0.1 | 0.2 | 0.2 | | | | X |

## *Purshia tridentata – Artemisia tridentata* Shrubland Alliance

**Common Name:** Bitter brush scrub

**NVC Alliance Code:** A3179. *Purshia tridentata - Artemisia tridentata* Mesic Steppe & Shrubland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Purshia glandulosa – Artemisia tridentata* | 6 | CEPP006746 |
| *Purshia glandulosa* | 4 | CEPP006747 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1789 m, Range 1435 – 2266 m
Slope: Mean 15°, Range 7 – 31°
Aspect: East-facing

Tree Cover: Mean 0.3%, Range 0 – 1%
Shrub Cover: Mean 27.4%, Range 12 – 55%
Herb Cover: Mean 17.7%, Range 2 – 75%

**Surface Covers:**
Large Rock: Mean 8.5%, Range 0.0 –30%
Small Rock: Mean 46.9%, Range 10 – 80%
Fines: Mean 25.2%, Range 2 – 86%
Litter: Mean 3.3%, Range 0 – 20%

**Conservation Status Rank: Global** G4; **State (California)** S3

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | **3** | **1** | **3** | | **1** | | **2** |

**Surveys Used in Description (N = 10):** A1805231806, DEVA0309, DEVA9212, DEVA9237, MOJC0529, SLTN0219, SLTN0249, SLTN0355, SLTN0605, SLTN1091

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Yucca brevifolia* | 30 | 30.0 | 0.1 | 0.2 | 1.0 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Purshia glandulosa* | 100 | 45.5 | 12.7 | 4.0 | 25.0 | **x** | | **x** | **x** |
| | *Artemisia tridentata* | 80 | 25.7 | 8.9 | 1.0 | 25.0 | **x** | | | **x** |
| | *Ericameria nauseosa* | 40 | 2.0 | 0.5 | 0.2 | 3.0 | | | | |
| | *Chrysothamnus viscidiflorus* | 30 | 1.8 | 0.7 | 1.0 | 5.0 | | | | |
| | *Ephedra viridis* | 30 | 1.8 | 0.4 | 0.1 | 2.0 | | | | |
| | *Ericameria cooperi* | 30 | 1.8 | 0.3 | 0.1 | 3.0 | | | | |
| | *Grayia spinosa* | 20 | 1.0 | 0.2 | 1.0 | 1.0 | | | | |
| | *Eriogonum fasciculatum* | 20 | 1.4 | 0.2 | 1.0 | 1.0 | | | | |
| | *Prunus andersonii* | 20 | 0.4 | 0.1 | 0.2 | 1.0 | | | | |
| | *Eriogonum umbellatum* | 20 | 0.2 | 0.1 | 0.2 | 1.0 | | | | |
| | *Ephedra nevadensis* | 20 | 0.6 | 0.1 | 0.1 | 1.0 | | | | |
| | *Stephanomeria pauciflora* | 20 | 0.5 | 0.1 | 0.1 | 0.5 | | | | |
| | *Atriplex canescens* | 20 | 0.2 | 0.0 | 0.2 | 0.2 | | | | |
| | *Coleogyne ramosissima* | 20 | 0.1 | 0.0 | 0.1 | 0.2 | | | | |
| | *unknown Asteraceae* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 70 | 5.9 | 2.2 | 0.1 | 20.0 | | | | **x** |
| | *Achnatherum speciosum* | 60 | 9.6 | 1.8 | 0.1 | 15.0 | | | | **x** |
| | *Elymus elymoides* | 50 | 9.8 | 0.4 | 0.1 | 2.0 | | | | **x** |
| | *Amsinckia* | 50 | 2.9 | 0.2 | 0.1 | 1.0 | | | | **x** |
| | *Gilia* | 40 | 6.1 | 0.9 | 0.2 | 8.0 | | | | |
| | *Cryptantha* | 40 | 4.5 | 0.3 | 0.1 | 2.0 | | | | |
| | *Layia glandulosa* | 40 | 2.8 | 0.3 | 0.1 | 2.0 | | | | |
| | *Eriastrum* | 40 | 0.8 | 0.1 | 0.1 | 0.2 | | | | |
| | *Bromus rubens* | 30 | 1.9 | 0.1 | 0.2 | 0.5 | | | | |
| | *Sphaeralcea ambigua* | 30 | 1.3 | 0.1 | 0.1 | 0.5 | | | | |
| | *Chaenactis stevioides* | 20 | 5.8 | 3.1 | 1.0 | 30.0 | | | | |
| | *Eriophyllum* | 20 | 2.4 | 1.6 | 0.5 | 15.0 | | | | |
| | *Phacelia bicolor* | 20 | 2.3 | 0.4 | 1.0 | 3.0 | | | | |
| | *Salvia columbariae* | 20 | 1.9 | 0.2 | 0.2 | 2.0 | | | | |
| | *Phacelia* | 20 | 1.7 | 0.2 | 0.1 | 2.0 | | | | |
| | *Phacelia vallis-mortae* | 20 | 2.2 | 0.1 | 0.2 | 1.0 | | | | |
| | *Poa secunda* | 20 | 1.1 | 0.1 | 0.2 | 1.0 | | | | |
| | *Mentzelia albicaulis* | 20 | 1.1 | 0.1 | 0.2 | 1.0 | | | | |
| | *Eriogonum* | 20 | 2.4 | 0.1 | 0.2 | 1.0 | | | | |
| | *Caulanthus pilosus* | 20 | 1.9 | 0.1 | 0.1 | 1.0 | | | | |
| | *Phlox stansburyi* | 20 | 0.6 | 0.0 | 0.2 | 0.2 | | | | |
| | *Phacelia fremontii* | 20 | 0.2 | 0.0 | 0.1 | 0.2 | | | | |
| | *Gilia brecciarum* | 20 | 0.4 | 0.0 | 0.1 | 0.2 | | | | |
| | *Cryptantha pterocarya* | 20 | 0.4 | 0.0 | 0.1 | 0.2 | | | | |
| | *Achnatherum hymenoides* | 20 | 0.5 | 0.0 | 0.1 | 0.2 | | | | |
| | Forb (herbaceous, not grass nor grasslike) | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | *Cryptogammic crust* | 20 | 20.0 | 0.1 | 0.2 | 0.5 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Purshia glandulosa* Association

**Common Name:** Antelope Bitterbrush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1514 m, Range 1435 – 1669 m
Slope: Mean 17°, Range 9 – 27°
Aspect: East-facing

Tree Cover: Mean 0.3%, Range 0 – 1%
Shrub Cover: Mean 17.5%, Range 12 – 20%
Herb Cover: Mean 25.1%, Range 2 – 75%

**Surface Covers:**
Large Rock: Mean 15.3%, Range 3.0 –30%
Small Rock: Mean 60.6%, Range 40 – 80%
Fines: Mean 10.3%, Range 2 – 25%
Litter: Mean 1.7%, Range 0 – 4%

**Surveys Used in Description (N = 4):** DEVA9212, MOJC0529, SLTN0219, SLTN0355

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Juniperus osteosperma* | 25 | 25.0 | 0.3 | 1.0 | 1.0 | | | | |
| | *Yucca brevifolia* | 25 | 25.0 | 0.1 | 0.2 | 0.2 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Purshia glandulosa* | 100 | 42.3 | 6.5 | 4.0 | 11.0 | X | | X | X |
| | *Ericameria cooperi* | 50 | 4.3 | 0.8 | 0.1 | 3.0 | | | | X |
| | *Eriogonum fasciculatum* | 50 | 3.5 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Artemisia tridentata* | 50 | 2.8 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Ephedra nevadensis* | 50 | 1.5 | 0.3 | 0.1 | 1.0 | | | | X |
| | *Stephanomeria pauciflora* | 50 | 1.2 | 0.2 | 0.1 | 0.5 | | | | X |
| | *Ericameria teretifolia* | 25 | 10.3 | 1.3 | 5.0 | 5.0 | | | | |
| | *Ceanothus leucodermis* | 25 | 5.8 | 1.0 | 4.0 | 4.0 | | | | |
| | *Ericameria laricifolia* | 25 | 2.8 | 0.5 | 2.0 | 2.0 | | | | |
| | *Prunus fasciculata* | 25 | 2.9 | 0.4 | 1.5 | 1.5 | | | | |
| | *Ericameria nauseosa* | 25 | 1.5 | 0.3 | 1.0 | 1.0 | | | | |
| | *Artemisia* | 25 | 1.9 | 0.3 | 1.0 | 1.0 | | | | |
| | *Chrysothamnus viscidiflorus* | 25 | 1.4 | 0.3 | 1.0 | 1.0 | | | | |
| | *Menodora spinescens* | 25 | 1.4 | 0.3 | 1.0 | 1.0 | | | | |
| | *Ephedra* | 25 | 1.9 | 0.3 | 1.0 | 1.0 | | | | |
| | *Grayia spinosa* | 25 | 1.4 | 0.3 | 1.0 | 1.0 | | | | |
| | *Ericameria cuneata* | 25 | 2.1 | 0.3 | 1.0 | 1.0 | | | | |
| | *Fallugia paradoxa* | 25 | 1.9 | 0.3 | 1.0 | 1.0 | | | | |
| | *Brickellia* | 25 | 1.0 | 0.1 | 0.5 | 0.5 | | | | |
| | *Agave utahensis* | 25 | 1.0 | 0.1 | 0.5 | 0.5 | | | | |
| | *Salvia mohavensis* | 25 | 1.0 | 0.1 | 0.5 | 0.5 | | | | |
| | *Plant* | 25 | 1.0 | 0.1 | 0.5 | 0.5 | | | | |
| | *Prunus* | 25 | 1.0 | 0.1 | 0.5 | 0.5 | | | | |
| | *Ericameria* | 25 | 1.0 | 0.1 | 0.5 | 0.5 | | | | |
| | *Gutierrezia microcephala* | 25 | 1.0 | 0.1 | 0.5 | 0.5 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub ctnd.** | | | | | | | | | | |
| | *Thamnosma montana* | 25 | 1.0 | 0.1 | 0.5 | 0.5 | | | | |
| | *Hymenoclea salsola* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Psorothamnus arborescens* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Brickellia oblongifolia* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Atriplex canescens* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Lycium cooperi* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Achnatherum speciosum* | 100 | 7.5 | 0.7 | 0.1 | 2.0 | X | | | X |
| | *Bromus tectorum* | 75 | 7.7 | 5.1 | 0.1 | 20.0 | X | | | X |
| | *Bromus rubens* | 75 | 4.7 | 0.3 | 0.2 | 0.5 | X | | | X |
| | *Chaenactis stevioides* | 50 | 14.6 | 7.8 | 1.0 | 30.0 | | | | X |
| | *Eriophyllum* | 50 | 5.9 | 3.9 | 0.5 | 15.0 | | | | X |
| | *Salvia columbariae* | 50 | 4.7 | 0.6 | 0.2 | 2.0 | | | | X |
| | *Poa secunda* | 50 | 2.8 | 0.3 | 0.2 | 1.0 | | | | X |
| | *Sphaeralcea ambigua* | 50 | 2.8 | 0.2 | 0.1 | 0.5 | | | | X |
| | *Layia glandulosa* | 50 | 1.1 | 0.1 | 0.1 | 0.2 | | | | X |
| | *Cryptantha pterocarya* | 50 | 1.1 | 0.1 | 0.1 | 0.2 | | | | X |
| | *Amsinckia* | 50 | 1.0 | 0.1 | 0.1 | 0.2 | | | | X |
| | *Cryptantha circumscissa* | 25 | 1.7 | 1.3 | 5.0 | 5.0 | | | | |
| | *Phacelia bicolor* | 25 | 1.0 | 0.8 | 3.0 | 3.0 | | | | |
| | *Lotus strigosus* | 25 | 3.8 | 0.5 | 2.0 | 2.0 | | | | |
| | *Phacelia* | 25 | 3.8 | 0.5 | 2.0 | 2.0 | | | | |
| | *Mentzelia albicaulis* | 25 | 1.9 | 0.3 | 1.0 | 1.0 | | | | |
| | *Penstemon* | 25 | 5.6 | 0.3 | 1.0 | 1.0 | | | | |
| | *Stephanomeria parryi* | 25 | 0.3 | 0.3 | 1.0 | 1.0 | | | | |
| | *Phacelia vallis-mortae* | 25 | 4.6 | 0.3 | 1.0 | 1.0 | | | | |
| | *Eriastrum densifolium* | 25 | 0.3 | 0.3 | 1.0 | 1.0 | | | | |
| | *Eriogonum* | 25 | 5.6 | 0.3 | 1.0 | 1.0 | | | | |
| | *Astragalus* | 25 | 2.8 | 0.1 | 0.5 | 0.5 | | | | |
| | *Caulanthus cooperi* | 25 | 0.9 | 0.1 | 0.5 | 0.5 | | | | |
| | *Hedeoma nana* | 25 | 2.8 | 0.1 | 0.5 | 0.5 | | | | |
| | *Emmenanthe penduliflora* | 25 | 0.9 | 0.1 | 0.5 | 0.5 | | | | |
| | *Cuscuta* | 25 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Phlox stansburyi* | 25 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Malacothrix californica* | 25 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Vulpia* | 25 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Tricardia watsonii* | 25 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cryptantha utahensis* | 25 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Chamaesyce albomarginata* | 25 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus carinatus* | 25 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Gilia* | 25 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Cryptogammic crust | 50 | 50.0 | 0.2 | 0.2 | 0.5 | | | | X |

## *Purshia glandulosa – Artemisia tridentata* Association

**Common Name:** Bitterbrush – Big Sagebrush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1973 m, Range 1745 – 2266 m
Slope: Mean 13°, Range 7 – 31°
Aspect: East-facing

Tree Cover: Mean 0.2%, Range 0 – 1%
Shrub Cover: Mean 35.4%, Range 22 – 55%
Herb Cover: Mean 11.8%, Range 5 – 25%

**Surface Covers:**
Large Rock: Mean 3.0%, Range 0.0 –10%
Small Rock: Mean 36.0%, Range 10 – 60%
Fines: Mean 37.2%, Range 20 – 86%
Litter: Mean 4.7%, Range 0 – 20%

**Surveys Used in Description (N = 6):** A1805231806, DEVA0309, DEVA9237, SLTN0249, SLTN0605, SLTN1091

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Yucca brevifolia* | 33 | 33.3 | 0.2 | 0.2 | 1.0 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Purshia glandulosa* | 100 | 47.7 | 16.8 | 9.0 | 25.0 | X | | X | X |
| | *Artemisia tridentata* | 100 | 41.0 | 14.5 | 8.0 | 25.0 | X | | X | X |
| | *Ericameria nauseosa* | 50 | 2.3 | 0.7 | 0.2 | 3.0 | | | | X |
| | *Ephedra viridis* | 50 | 2.9 | 0.7 | 0.1 | 2.0 | | | | X |
| | *Chrysothamnus viscidiflorus* | 33 | 2.1 | 1.0 | 1.0 | 5.0 | | | | |
| | *Prunus andersonii* | 33 | 0.6 | 0.2 | 0.2 | 1.0 | | | | |
| | *Eriogonum umbellatum* | 33 | 0.4 | 0.2 | 0.2 | 1.0 | | | | |
| | *Coleogyne ramosissima* | 33 | 0.1 | 0.1 | 0.1 | 0.2 | | | | |
| | unknown Asteraceae | 33 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| **Herb** | | | | | | | | | | |
| | *Elymus elymoides* | 67 | 16.3 | 0.7 | 0.2 | 2.0 | | | | X |
| | *Bromus tectorum* | 67 | 4.6 | 0.3 | 0.1 | 1.0 | | | | X |
| | *Gilia* | 50 | 9.6 | 1.5 | 0.2 | 8.0 | | | | X |
| | *Cryptantha* | 50 | 7.4 | 0.4 | 0.1 | 2.0 | | | | X |
| | *Amsinckia* | 50 | 4.3 | 0.2 | 0.1 | 1.0 | | | | X |
| | *Eriastrum* | 50 | 1.3 | 0.1 | 0.1 | 0.2 | | | | X |
| | *Achnatherum speciosum* | 33 | 10.9 | 2.5 | 0.1 | 15.0 | | | | |
| | *Layia glandulosa* | 33 | 3.9 | 0.4 | 0.2 | 2.0 | | | | |
| | *Phacelia fremontii* | 33 | 0.4 | 0.1 | 0.1 | 0.2 | | | | |
| | *Achnatherum hymenoides* | 33 | 0.9 | 0.1 | 0.1 | 0.2 | | | | |

## *Quercus john-tuckeri* Shrubland Alliance

**Common Name:** Tucker oak chaparral

**NVC Alliance Code:** A3793. *Quercus john-tuckeri - Quercus cornelius-mulleri - Fremontodendron californicum* Chaparral Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Quercus john-tuckeri* (alliance) | 1 | A3793 |
| *Quercus john-tuckeri* | 2 | |
| *Quercus john-tuckeri – Juniperus californica – Ericameria linearifolia* | 1 | |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1309 m, Range 1123 – 1490 m
Slope: Mean 18°, Range 3 – 27°
Aspect: North-facing

Tree Cover: Mean 0.4%, Range 0 – 1%
Shrub Cover: Mean 36.0%, Range 24 – 45%
Herb Cover: Mean 13.8%, Range 2 – 35%

**Surface Covers:**
Large Rock: Mean 0.3%, Range 0.0 –1%
Small Rock: Mean 9.5%, Range 5 – 18%
Fines: Mean 32.3%, Range 15 – 42%
Litter: Mean 55.7%, Range 40 – 77%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **3** | **1** | | | | | | |

**Surveys Used in Description (N = 4):** JAWB0030, JAWB0031, JAWB0038, POA1504011040

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus monophylla* | 75 | 62.5 | 0.2 | 0.2 | 0.4 | **x** | **x** | | **x** |
| | *Juniperus californica* | 25 | 12.5 | 0.1 | 0.4 | 0.4 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Quercus john-tuckeri* | 100 | 59.8 | 23.8 | 13.0 | 30.0 | **x** | **x** | | **x** |
| | *Cercocarpus montanus* var. *glaber* | 75 | 9.3 | 2.8 | 0.2 | 9.0 | **x** | | | **x** |
| | *Ceanothus cuneatus* | 50 | 10.8 | 5.0 | 10.0 | 10.0 | | | | **x** |
| | *Ericameria linearifolia* | 50 | 7.1 | 2.6 | 0.2 | 10.0 | | | | **x** |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub ctnd.** | | | | | | | | | | |
| | *Garrya flavescens* | 50 | 3.8 | 1.8 | 2.0 | 5.0 | | | | **x** |
| | *Rhamnus ilicifolia* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Fremontodendron californicum* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Lonicera interrupta* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Garrya* | | 5.4 | 1.5 | 6.0 | 6.0 | | | | |
| | *Ribes quercetorum* | 25 | 2.6 | 1.3 | 5.0 | 5.0 | | | | |
| | *Opuntia basilaris* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Phoradendron juniperinum* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Hesperoyucca whipplei* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Arctostaphylos viscida* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Tauschia hartwegii* | 75 | 21.6 | 0.8 | 0.2 | 2.0 | **x** | | | **x** |
| | *Marah horridus* | 75 | 4.1 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Bromus rubens* | 50 | 34.3 | 7.5 | 10.0 | 20.0 | | | | **x** |
| | *Galium andrewsii* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Bowlesia incana* | 50 | 0.7 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Bromus* | 25 | 17.9 | 1.8 | 7.0 | 7.0 | | | | |
| | *Poa secunda* | 25 | 2.5 | 0.8 | 3.0 | 3.0 | | | | |
| | *Phacelia* | 25 | 5.1 | 0.5 | 2.0 | 2.0 | | | | |
| | *Bromus tectorum* | 25 | 1.6 | 0.5 | 2.0 | 2.0 | | | | |
| | *Tauschia parishii* | 25 | 0.8 | 0.3 | 1.0 | 1.0 | | | | |
| | *Cordylanthus* | 25 | 1.8 | 0.3 | 1.0 | 1.0 | | | | |
| | *Chenopodium* | 25 | 0.8 | 0.3 | 1.0 | 1.0 | | | | |
| | *Mentzelia dispersa* | 25 | 3.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Melica imperfecta* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cryptantha oxygona* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cirsium occidentale* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Lasthenia* | 25 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cryptantha muricata* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Amsinckia* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Plectritis ciliosa* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Phoradendron villosum* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Claytonia* | 25 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Stylomecon heterophylla* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Allium* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Yabea microcarpa* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Vulpia* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Triteleia laxa* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Thysanocarpus curvipes* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Lomatium utriculatum* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Athysanus pusillus* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Silene californica* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 75 | 72.9 | 0.9 | 0.4 | 2.2 | **x** | **x** | | **x** |
| | Moss | 25 | 2.1 | 0.1 | 0.2 | 0.2 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Quercus john-tuckeri Association*

**Common Name:** Tucker Oak Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1312 m, Range 1265 – 1359 m
Slope: Mean 26°, Range 25 – 27°
Aspect: Northeast-facing

Tree Cover: Mean 0.2%, Range 0 – 0.4%
Shrub Cover: Mean 42.5%, Range 40 – 45%
Herb Cover: Mean 18.5%, Range 2 – 35%

**Surface Covers:**
Large Rock: Mean 0.4%, Range 0.2 –1%
Small Rock: Mean 11.6%, Range 5 – 18%
Fines: Mean 27.5%, Range 15 – 40%
Litter: Mean 58.5%, Range 40 – 77%

**Surveys Used in Description (N = 2):** JAWB0030, JAWB0038

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus monophylla* | 100 | 100. | 0.2 | 0.2 | 0.2 | X | X | | X |
| **Shrub** | | | | | | | | | | |
| | *Quercus john-tuckeri* | 100 | 61.6 | 28.5 | 27.0 | 30.0 | X | X | | X |
| | *Ceanothus cuneatus* | 100 | 21.7 | 10.0 | 10.0 | 10.0 | X | | | X |
| | *Garrya flavescens* | 100 | 7.7 | 3.5 | 2.0 | 5.0 | X | | | X |
| | *Cercocarpus montanus* var. *glaber* | 100 | 2.4 | 1.1 | 0.2 | 2.0 | X | | | X |
| | *Fremontodendron californicum* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Ribes quercetorum* | 50 | 5.3 | 2.5 | 5.0 | 5.0 | | | | X |
| | *Ericameria linearifolia* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Lonicera interrupta* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Rhamnus ilicifolia* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Arctostaphylos viscida* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Tauschia hartwegii* | 100 | 36.0 | 0.6 | 0.2 | 1.0 | X | | X | X |
| | *Marah horridus* | 100 | 7.5 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Bromus rubens* | 50 | 32.9 | 10.0 | 20.0 | 20.0 | | | | X |
| | *Poa secunda* | 50 | 4.9 | 1.5 | 3.0 | 3.0 | | | | X |
| | *Bromus tectorum* | 50 | 3.3 | 1.0 | 2.0 | 2.0 | | | | X |
| | *Chenopodium* | 50 | 1.6 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Tauschia parishii* | 50 | 1.6 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Cryptantha oxygona* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Yabea microcarpa* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Stylomecon heterophylla* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Mentzelia dispersa* | 50 | 7.1 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Lomatium utriculatum* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Triteleia laxa* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Plectritis ciliosa* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Phoradendron villosum* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Thysanocarpus curvipes* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 100 | 95.8 | 1.3 | 0.4 | 2.2 | X | X | | X |
| | Moss | 50 | 4.2 | 0.1 | 0.2 | 0.2 | | | | X |

## *Quercus john-tuckeri – Juniperus californica – Ericameria linearifolia* Association

**Common Name:** Tucker Oak – California Juniper – Narrowleaf Goldenbush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: 1123 m
Slope: 3°
Aspect: Northwest-facing

Tree Cover: 1%
Shrub Cover: 35%
Herb Cover: 15%

**Surface Covers:**
Large Rock: 0%
Small Rock: 5%
Fines: 42%
Litter: 50%

**Surveys Used in Description (N = 1):** JAWB0031

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | Dom | cDom | Often |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Juniperus californica* | 100 | 50.0 | 0.4 | 0.4 | 0.4 | X | X | | X |
| | *Pinus monophylla* | 100 | 50.0 | 0.4 | 0.4 | 0.4 | X | X | | X |
| **Shrub** | | | | | | | | | | |
| | *Quercus john-tuckeri* | 100 | 69.4 | 25.0 | 25.0 | 25.0 | X | X | | X |
| | *Ericameria linearifolia* | 100 | 27.8 | 10.0 | 10.0 | 10.0 | X | | | X |
| | *Phoradendron juniperinum* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Hesperoyucca whipplei* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Lonicera interrupta* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Opuntia basilaris* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Rhamnus ilicifolia* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 100 | 71.4 | 10.0 | 10.0 | 10.0 | X | X | | X |
| | *Tauschia hartwegii* | 100 | 14.3 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Cordylanthus* | 100 | 7.1 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Marah horridus* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Cirsium occidentale* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Melica imperfecta* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Silene californica* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Galium andrewsii* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 100 | 100. | 1.0 | 1.0 | 1.0 | X | X | | X |

## *Quercus wislizeni* (shrub) Shrubland Alliance

**Common Name:** Interior live oak chaparral

**NVC Alliance Code:** A3860. *Quercus wislizeni* var. *frutescens - Arctostaphylos glandulosa* Pre-montane Chaparral Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Quercus wislizeni* var. *frutescens* | 4 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

**Plot/Sample Data Summary:**

Elevation: Mean 1247 m, Range 882 – 1774 m
Slope: Mean 10°, Range 2 – 18°
Aspect: Variable

Tree Cover: Mean 11.5%, Range 0 – 30%
Shrub Cover: Mean 13.7%, Range 3 – 40%
Herb Cover: Mean 28.7%, Range 0 – 78%

**Surface Covers:**
Large Rock: Mean 6.0%, Range 0.0 –12%
Small Rock: Mean 3.8%, Range 0 – 7%
Fines: Mean 42.0%, Range 32 – 52%
Litter: Mean 46.5%, Range 28 – 65%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | **1** | | | | | | **2** | |

**Surveys Used in Description (N = 4):** ERSKBO20, ERSKVO72, JAWB0014, JAWB0214

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Quercus wislizeni* | 100 | 99.2 | 21.3 | 0.2 | 40.0 | **x** | **x** | | **x** |
| | *Pinus sabiniana* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Quercus douglasii* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Ribes* | 75 | 27.2 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Ericameria nauseosa* | 50 | 12.1 | 0.6 | 0.2 | 2.0 | | | | **x** |
| | *Calystegia longipes* | 50 | 6.9 | 0.3 | 0.2 | 1.0 | | | | **x** |
| | *Ericameria linearifolia* | 50 | 6.9 | 0.3 | 0.2 | 1.0 | | | | **x** |
| | *Ephedra viridis* | 50 | 2.7 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Lonicera interrupta* | 50 | 2.2 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Rhamnus ilicifolia* | 50 | 2.2 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Ceanothus greggii var. vestitus* | 25 | 23.3 | 2.0 | 8.0 | 8.0 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Ceanothus cuneatus* | 25 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Ceanothus integerrimus* | 25 | 1.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Prunus fasciculata* | 25 | 1.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum fasciculatum* | 25 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Fremontodendron californicum* | 25 | 1.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Hesperoyucca whipplei* | 25 | 1.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Sambucus nigra* | 25 | 1.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Malacothamnus fremontii* | 25 | 1.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Lotus scoparius* | 25 | 1.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Artemisia tridentata* | 25 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Erodium cicutarium* | 75 | 10.9 | 6.4 | 0.2 | 21.3 | **x** | | | **x** |
| | *Bromus rubens* | 75 | 5.7 | 3.1 | 0.2 | 10.4 | **x** | | | **x** |
| | *Eriophyllum confertiflorum* | 75 | 0.9 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Bromus tectorum* | 50 | 40.2 | 4.6 | 0.2 | 18.0 | | | | **x** |
| | *Avena* | 50 | 4.8 | 3.3 | 0.2 | 12.9 | | | | **x** |
| | *Pholistoma auritum* | 50 | 2.6 | 1.6 | 0.2 | 6.0 | | | | **x** |
| | *Cirsium occidentale* | 50 | 1.9 | 1.1 | 0.2 | 4.0 | | | | **x** |
| | *Delphinium* | 50 | 2.7 | 0.7 | 0.6 | 2.2 | | | | **x** |
| | *Amsinckia* | 50 | 2.0 | 0.6 | 0.4 | 2.0 | | | | **x** |
| | *Vulpia* | 50 | 1.3 | 0.6 | 0.2 | 2.0 | | | | **x** |
| | *Marah horridus* | 50 | 1.3 | 0.6 | 0.2 | 2.0 | | | | **x** |
| | *Melica californica* | 50 | 1.0 | 0.3 | 0.2 | 1.0 | | | | **x** |
| | *Eschscholzia caespitosa* | 50 | 0.7 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Gnaphalium* | 50 | 0.7 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Eriodictyon parryi* | 50 | 0.7 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Scrophularia californica* | 50 | 0.7 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Mimulus* | 50 | 0.7 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Plagiobothrys arizonicus* | 50 | 0.7 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Pellaea mucronata* | 50 | 0.7 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Solanum* | 50 | 0.7 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Bromus diandrus* | 25 | 1.8 | 1.4 | 5.6 | 5.6 | | | | |
| | *Senecio flaccidus* | 25 | 0.6 | 0.5 | 2.0 | 2.0 | | | | |
| | *Trichostema lanceolatum* | 25 | 0.6 | 0.5 | 2.0 | 2.0 | | | | |
| | *Lupinus bicolor* | 25 | 0.6 | 0.5 | 2.0 | 2.0 | | | | |
| | *Poa secunda* | 25 | 0.8 | 0.3 | 1.0 | 1.0 | | | | |
| | *Mentzelia albicaulis* | 25 | 0.8 | 0.3 | 1.0 | 1.0 | | | | |
| | *Sisymbrium* | 25 | 0.8 | 0.3 | 1.0 | 1.0 | | | | |
| | *Muhlenbergia rigens* | 25 | 0.8 | 0.3 | 1.0 | 1.0 | | | | |
| | *Lasthenia gracilis* | 25 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Artemisia douglasiana* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Pentagramma triangularis* | 25 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Juncus orthophyllus* | 25 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Microseris lindleyi* | 25 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |
| | *Phacelia cicutaria* | 25 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Rhus trilobata – Crataegus rivularis – Forestiera pubescens* Shrubland Alliance

**Common Name:** Basket bush – river hawthorn – desert olive patches

**NVC Alliance Code:** A3799. *Rhus trilobata - Crataegus rivularis - Forestiera pubescens* Shrubland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Forestiera pubescens* | 5 | CEGL001126 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1428 m, Range 1019 – 2135 m
Slope: Mean 14°, Range 1 – 31°
Aspect: Variable

Tree Cover: Mean 10.3%, Range 0 – 30%
Shrub Cover: Mean 46.0%, Range 14 – 95%
Herb Cover: Mean 2.4%, Range 1 – 5%

**Surface Covers:**
Large Rock: Mean 8.4%, Range 0.0 –37%
Small Rock: Mean 9.2%, Range 0 – 17%
Fines: Mean 55.6%, Range 13 – 91%
Litter: Mean 24.0%, Range 0 – 72%

**Conservation Status Rank: Global** G4; **State (California)** S3?

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **3** | **1** | | | | | | **1** |

**Surveys Used in Description (N = 5):** DEVA9267, JAWB0024, JAWB0032, JAWB0036, SLTN0351

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Salix* | 20 | 20.0 | 2.0 | 10.0 | 10.0 | | | | |
| | *Quercus wislizeni* | 20 | 20.0 | 0.8 | 4.0 | 4.0 | | | | |
| | *Quercus ×alvordiana* | 20 | 6.7 | 0.6 | 3.0 | 3.0 | | | | |
| | *Quercus douglasii* | 20 | 20.0 | 0.4 | 2.0 | 2.0 | | | | |
| | *Pinus sabiniana* | 20 | 4.4 | 0.4 | 2.0 | 2.0 | | | | |
| | *Pinus monophylla* | 20 | 4.4 | 0.4 | 2.0 | 2.0 | | | | |
| | *Aesculus californica* | 20 | 4.4 | 0.4 | 2.0 | 2.0 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Forestiera pubescens* | 100 | 85.6 | 49.6 | 30.0 | 80.0 | **x** | **x** | | **x** |
| | *Rosa woodsii* | 40 | 2.3 | 2.4 | 2.0 | 10.0 | | | | |
| | *Artemisia tridentata* | 40 | 1.8 | 1.2 | 1.0 | 5.0 | | | | |
| | *Ericameria nauseosa* | 40 | 0.2 | 0.2 | 0.1 | 1.0 | | | | |
| | *Salix exigua* | 20 | 6.4 | 7.0 | 35.0 | 35.0 | | | | |
| | *Baccharis sergiloides* | 20 | 1.8 | 2.0 | 10.0 | 10.0 | | | | |
| | *Purshia stansburiana* | 20 | 0.5 | 0.6 | 3.0 | 3.0 | | | | |
| | *Ceanothus cuneatus* | 20 | 0.6 | 0.2 | 1.0 | 1.0 | | | | |
| | *Baccharis salicifolia* | 20 | 0.4 | 0.2 | 1.0 | 1.0 | | | | |
| | *Eriogonum fasciculatum* | 20 | 0.0 | 0.0 | 0.2 | 0.2 | | | | |
| | *Ericameria linearifolia* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Ephedra viridis* | 20 | 0.0 | 0.0 | 0.2 | 0.2 | | | | |
| | *Gutierrezia sarothrae* | 20 | 0.0 | 0.0 | 0.2 | 0.2 | | | | |
| | *Lonicera interrupta* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Tetradymia canescens* | 20 | 0.0 | 0.0 | 0.1 | 0.1 | | | | |
| | *Artemisia ludoviciana* | 20 | 0.0 | 0.0 | 0.1 | 0.1 | | | | |
| **Herb** | | | | | | | | | | |
| | *Bromus rubens* | 40 | 26.5 | 1.0 | 1.0 | 4.0 | | | | |
| | *Bromus madritensis* | 40 | 27.8 | 0.6 | 1.0 | 2.0 | | | | |
| | *Avena* | 20 | 9.1 | 0.2 | 1.0 | 1.0 | | | | |
| | *Bromus tectorum* | 20 | 5.6 | 0.2 | 1.0 | 1.0 | | | | |
| | *Marah horridus* | 20 | 1.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Nicotiana attenuata* | 20 | 3.3 | 0.0 | 0.2 | 0.2 | | | | |
| | *Chamaesyce albomarginata* | 20 | 1.8 | 0.0 | 0.2 | 0.2 | | | | |
| | *Erodium cicutarium* | 20 | 0.9 | 0.0 | 0.2 | 0.2 | | | | |
| | *Amsinckia* | 20 | 1.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Achnatherum speciosum* | 20 | 0.9 | 0.0 | 0.2 | 0.2 | | | | |
| | *Stanleya* | 20 | 0.9 | 0.0 | 0.2 | 0.2 | | | | |
| | *Bowlesia incana* | 20 | 1.1 | 0.0 | 0.2 | 0.2 | | | | |
| | Forb (herbaceous, not grass nor grasslike) | 20 | 1.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Elymus elymoides* | 20 | 1.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Eriastrum* | 20 | 1.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Angelica lineariloba* | 20 | 1.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Solidago* | 20 | 1.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Allium* | 20 | 1.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Leymus cinereus* | 20 | 1.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Lomatium* | 20 | 1.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Camissonia pusilla* | 20 | 1.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Lupinus* | 20 | 1.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Phacelia bicolor* | 20 | 1.8 | 0.0 | 0.1 | 0.1 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Ribes quercetorum* Shrubland Alliance

**Common Name:** Oak gooseberry thickets

**NVC Alliance Code:** n/a

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Ribes quercetorum* | 3 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1395 m, Range 1310 – 1448 m
Slope: Mean 22°, Range 10 – 34°
Aspect: Northeast-facing

Tree Cover: Mean 0.7%, Range 0 – 2%
Shrub Cover: Mean 48.3%, Range 38 – 55%
Herb Cover: Mean 0.7%, Range 0 – 2%

**Surface Covers:**
Large Rock: 0.0%
Small Rock: Mean 5.6%, Range 3 – 8%
Fines: Mean 82.0%, Range 77 – 87%
Litter: Mean 10.0%, Range 8 – 12%

**Conservation Status Rank: Global** G2; **State (California)** S2?

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **1** | **2** | | | | | | |

**Surveys Used in Description (N = 3):** JAWB0028, POA1504011227, TEHA0034

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus sabiniana* | 33 | 33.3 | 0.7 | 2.0 | 2.0 | | | | |
| | *Quercus douglasii* | 33 | 33.3 | 0.1 | 0.2 | 0.2 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Ribes quercetorum* | 100 | 93.8 | 44.7 | 38.0 | 51.0 | **x** | **x** | **x** | **x** |
| | *Artemisia tridentata* | 67 | 2.5 | 1.3 | 2.0 | 2.0 | | | | **x** |
| | *Sambucus nigra* | 33 | 3.2 | 1.7 | 5.0 | 5.0 | | | | |
| | *Ericameria nauseosa* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Fremontodendron californicum* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Quercus john-tuckeri* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Chenopodium* | 33 | 11.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus madritensis* | 33 | 11.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Nicotiana attenuata* | 33 | 11.1 | 0.1 | 0.2 | 0.2 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = 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* / Mesic graminoids | 8 | CEGL001203 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1670 m, Range 1154 – 2306 m
Slope: Mean 3°, Range 0 – 6°
Aspect: Variable

Tree Cover: Mean 4.4%, Range 0 – 12%
Shrub Cover: Mean 50.3%, Range 8 – 85%
Herb Cover: Mean 28.4%, Range 4 – 100%

**Surface Covers:**
Large Rock: Mean 0.8%, Range 0.0 –2%
Small Rock: Mean 4.6%, Range 0 – 30%
Fines: Mean 29.6%, Range 0 – 65%
Litter: Mean 42.9%, Range 0 – 94%

**Conservation Status Rank: Global** G5; **State (California)** S4

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | **2** | **4** | | | | | **2** |

**Surveys Used in Description (N = 8):** C1805211724, DEVA9235, DEVA9655, OWVA0013, OWVA0032, OWVA0035, SLTN0331, SLTN0810

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Salix laevigata* | 50 | 40.3 | 3.2 | 4.0 | 9.0 | | | | **x** |
| | *Salix gooddingii* | 25 | 5.1 | 0.5 | 1.0 | 3.0 | | | | |
| | *Robinia pseudoacacia* | 25 | 2.2 | 0.2 | 0.2 | 1.0 | | | | |
| | *Betula occidentalis* | 25 | 2.0 | 0.2 | 0.2 | 1.0 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Salix exigua* | 100 | 67.8 | 45.6 | 10.0 | 75.0 | **x** | **x** | | **x** |
| | *Rosa woodsii* | 75 | 8.2 | 8.8 | 0.5 | 55.0 | **x** | | | **x** |
| | *Artemisia tridentata* | 50 | 3.1 | 1.3 | 1.0 | 5.0 | | | | **x** |
| | *Ericameria nauseosa* | 38 | 3.6 | 0.9 | 0.1 | 7.0 | | | | |
| | *Salix lasiolepis* | 25 | 7.7 | 6.6 | 25.0 | 28.0 | | | | |
| | *Forestiera pubescens* | 25 | 2.3 | 1.8 | 6.0 | 8.0 | | | | |
| | *Artemisia ludoviciana* | 25 | 3.2 | 1.5 | 5.0 | 7.0 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Juncus mexicanus* | 38 | 9.1 | 3.9 | 1.0 | 20.0 | | | | |
| | *Carex praegracilis* | 38 | 6.7 | 1.5 | 0.2 | 8.0 | | | | |
| | *Melilotus* | 38 | 9.1 | 1.1 | 1.0 | 5.0 | | | | |
| | *Bromus tectorum* | 38 | 0.7 | 0.1 | 0.1 | 0.2 | | | | |
| | *Carex* | 25 | 9.7 | 2.6 | 1.0 | 20.0 | | | | |
| | *Distichlis spicata* | 25 | 11.1 | 1.9 | 7.0 | 8.0 | | | | |
| | *Juncus* | 25 | 4.4 | 1.4 | 1.0 | 10.0 | | | | |
| | Graminoid (grass or grasslike) | 25 | 7.8 | 0.9 | 1.5 | 6.0 | | | | |
| | *Nasturtium officinale* | 25 | 2.2 | 0.2 | 0.2 | 1.0 | | | | |
| | *Juncus arcticus* | 25 | 2.8 | 0.2 | 0.2 | 1.0 | | | | |
| | *Epilobium* | 25 | 0.1 | 0.0 | 0.1 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Moss | 38 | 30.5 | 0.5 | 0.2 | 3.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Salix lasiolepis* Shrubland Alliance

**Common Name:** Arroyo willow thickets

**NVC Alliance Code:** A3878. *Salix lasiolepis* Warm Desert Wet Shrubland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Salix lasiolepis* (alliance) | 2 | A3878 |
| *Salix lasiolepis* / Barren Ground | 2 | CEGL001216 |
| *Salix lasiolepis – Baccharis salicifolia* | 1 | CEGL002875 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1367 m, Range 973 – 1676 m
Slope: Mean 4°, Range 1 – 10°
Aspect: Variable

Tree Cover: Mean 0.6%, Range 0 – 1%
Shrub Cover: Mean 46.2%, Range 1 – 65%
Herb Cover: Mean 4.6%, Range 0 – 10%

**Surface Covers:**
Large Rock: Mean 3.9%, Range 1.0 –10%
Small Rock: Mean 23.0%, Range 8 – 50%
Fines: Mean 53.3%, Range 23 – 86%
Litter: Mean 19.3%, Range 2 – 50%

**Conservation Status Rank: Global** G4; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | **2** | | **1** | | | | | **1** |

**Surveys Used in Description (N = 5):** C1805231436, DEVA9341, JAWB0013, JAWB0021, JAWB0101

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Salix laevigata* | 60 | 43.3 | 0.3 | 0.2 | 1.0 | | | | x |
| | *Salix gooddingii* | 20 | 16.7 | 0.2 | 1.0 | 1.0 | | | | |
| | *Juniperus californica* | 20 | 20.0 | 0.0 | 0.2 | 0.2 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Salix lasiolepis* | 100 | 82.1 | 33.0 | 0.2 | 65.0 | x | x | | x |
| | *Baccharis salicifolia* | 60 | 4.8 | 2.4 | 0.2 | 10.0 | | | | x |
| | *Ericameria nauseosa* | 40 | 3.1 | 2.0 | 0.2 | 10.0 | | | | |

| Layer | Taxon | Con | RelAvg | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Baccharis sergiloides* | 20 | 3.0 | 2.0 | 10.0 | 10.0 | | | | |
| | *Salix exigua* | 20 | 2.4 | 1.6 | 8.0 | 8.0 | | | | |
| | *Forestiera pubescens* | 20 | 2.1 | 1.0 | 5.0 | 5.0 | | | | |
| | *Artemisia tridentata* | 20 | 0.8 | 0.4 | 2.0 | 2.0 | | | | |
| | *Artemisia dracunculus* | 20 | 0.4 | 0.2 | 1.0 | 1.0 | | | | |
| | *Encelia actonii* | 20 | 0.3 | 0.2 | 1.0 | 1.0 | | | | |
| | *Brickellia californica* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Ribes roezlii* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Purshia glandulosa* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Atriplex canescens* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Fremontodendron californicum* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Rosa woodsii* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Picrothamnus desertorum* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Prunus fasciculata* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Lycium cooperi* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Hymenoclea salsola* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Ericameria linearifolia* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Ribes quercetorum* | 20 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Leymus triticoides* | 60 | 12.9 | 0.7 | 0.2 | 3.0 | | | | **x** |
| | *Bromus rubens* | 40 | 15.1 | 1.4 | 0.2 | 7.0 | | | | |
| | *Solidago* | 40 | 6.1 | 0.4 | 0.2 | 2.0 | | | | |
| | *Juncus mexicanus* | 40 | 4.4 | 0.2 | 0.2 | 1.0 | | | | |
| | *Bromus tectorum* | 40 | 3.0 | 0.2 | 0.2 | 1.0 | | | | |
| | *Polypogon monspeliensis* | 40 | 2.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Schismus* | 20 | 2.1 | 0.2 | 1.0 | 1.0 | | | | |
| | *Nicotiana attenuata* | 20 | 9.1 | 0.2 | 1.0 | 1.0 | | | | |
| | *Distichlis spicata* | 20 | 2.1 | 0.2 | 1.0 | 1.0 | | | | |
| | *Typha* | 20 | 2.6 | 0.2 | 1.0 | 1.0 | | | | |
| | *Phacelia* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Mimulus guttatus* | 20 | 0.8 | 0.0 | 0.2 | 0.2 | | | | |
| | *Nasturtium officinale* | 20 | 0.8 | 0.0 | 0.2 | 0.2 | | | | |
| | *Cuscuta* | 20 | 1.8 | 0.0 | 0.2 | 0.2 | | | | |
| | *Mentzelia* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Cryptantha utahensis* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Melilotus* | 20 | 1.8 | 0.0 | 0.2 | 0.2 | | | | |
| | *Eriastrum wilcoxii* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Lupinus* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Eriogonum pusillum* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Gilia* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| | *Elymus elymoides* | 20 | 0.5 | 0.0 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Algae | 20 | 20.0 | 1.0 | 1.0 | 1.0 | | | | |
| | Moss | 20 | 20.0 | 1.0 | 1.0 | 1.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Salix lasiolepis – Baccharis salicifolia* Association

**Common Name:** Arroyo Willow / Mule-fat Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: 973 m
Slope: 2°
Aspect: Northwest-facing

Tree Cover: 0%
Shrub Cover: 45%
Herb Cover: 3%

**Surface Covers:**
Large Rock: 2.2%
Small Rock: 50%
Fines: 50%
Litter: 5%

**Surveys Used in Description (N = 1):** JAWB0021

**Association Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Juniperus californica* | 100 | 100. | 0.2 | 0.2 | 0.2 | X | X | | X |
| **Shrub** | | | | | | | | | | |
| | *Salix lasiolepis* | 100 | 62.0 | 30.0 | 30.0 | 30.0 | X | X | | X |
| | *Baccharis salicifolia* | 100 | 20.7 | 10.0 | 10.0 | 10.0 | X | | | X |
| | *Forestiera pubescens* | 100 | 10.3 | 5.0 | 5.0 | 5.0 | X | | | X |
| | *Artemisia tridentata* | 100 | 4.1 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Artemisia dracunculus* | 100 | 2.1 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Ribes quercetorum* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Brickellia californica* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Herb** | | | | | | | | | | |
| | *Nicotiana attenuata* | 100 | 45.5 | 1.0 | 1.0 | 1.0 | X | | X | X |
| | *Artemisia douglasiana* | 100 | 9.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Melilotus* | 100 | 9.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Juncus bufonius* | 100 | 9.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Cuscuta* | 100 | 9.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Polypogon monspeliensis* | 100 | 9.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Scrophularia californica* | 100 | 9.1 | 0.2 | 0.2 | 0.2 | X | | | X |

## *Salix lasiolepis* / Barren Ground Association

**Common Name:** Arroyo Willow / Barren Ground Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1541 m, Range 1406 – 1676 m
Slope: Mean 6°, Range 2 – 10°
Aspect: East-facing

Tree Cover: 1%
Shrub Cover: Mean 33.0%, Range 1 – 65%
Herb Cover: 5%

**Surface Covers:**
Large Rock: Mean 5.6%, Range 1.0 –10%
Small Rock: Mean 10.0%, Range 8 – 12%
Fines: Mean 54.5%, Range 23 – 86%
Litter: Mean 26.0%, Range 2 – 50%

**Surveys Used in Description (N = 2):** DEVA9341, JAWB0013

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Salix laevigata* | 50 | 50.0 | 0.5 | 1.0 | 1.0 | | | | X |
| **Shrub** | | | | | | | | | | |
| | *Salix lasiolepis* | 100 | 97.9 | 50.0 | 35.0 | 65.0 | X | X | | X |
| | *Rosa woodsii* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Ericameria linearifolia* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Baccharis salicifolia* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Purshia glandulosa* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Prunus fasciculata* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Picrothamnus desertorum* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Fremontodendron californicum* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Ericameria nauseosa* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Ribes roezlii* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Leymus triticoides* | 100 | 31.3 | 1.6 | 0.2 | 3.0 | X | | X | X |
| | *Solidago* | 100 | 15.2 | 1.1 | 0.2 | 2.0 | X | | | X |
| | *Juncus mexicanus* | 50 | 10.0 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Typha* | 50 | 6.6 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Bromus tectorum* | 50 | 6.6 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Phacelia vallis-mortae* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Elymus elymoides* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Eriogonum pusillum* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Cryptantha utahensis* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Veronica anagallis-aquatica* | 50 | 2.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Salvia columbariae* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Amsinckia* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Asclepias fascicularis* | 50 | 2.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Polypogon monspeliensis* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Camissonia claviformis* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Phacelia* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Eriastrum wilcoxii* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Claytonia perfoliata* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Bromus rubens* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Castilleja angustifolia* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Nasturtium officinale* | 50 | 2.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Gilia* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Lupinus* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Mentzelia* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Mimulus guttatus* | 50 | 2.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Cirsium* | 50 | 1.3 | 0.1 | 0.2 | 0.2 | | | | X |
| **Non-vasc.** | | | | | | | | | | |
| | Moss | 50 | 50.0 | 0.5 | 1.0 | 1.0 | | | | X |
| | Algae | 50 | 50.0 | 0.5 | 1.0 | 1.0 | | | | X |

## *Sarcobatus vermiculatus* Shrubland Alliance

**Common Name:** Greasewood scrub

**NVC Alliance Code:** A1046. *Sarcobatus vermiculatus* Intermountain Wet Shrubland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Sarcobatus vermiculatus / Sporobolus airoides* | 9 | CEGL001368 |
| *Sarcobatus vermiculatus* (alliance) | 1 | A1046 |
| *Sarcobatus vermiculatus* Disturbed | 5 | CEGL001357 |
| *Sarcobatus vermiculatus / Leymus cinereus* | 2 | CEGL001366 |
| *Sarcobatus vermiculatus – Atriplex confertifolia – (Picrothamnus desertorum, Suaeda moquinii)* | 4 | CEGL001371 |
| *Chrysothamnus albidus* | 11 | |
| *Atriplex parryi* | 8 | CEGL002711 |
| *Sarcobatus vermiculatus – Suaeda moquinii* | 5 | CEGL001370 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1191 m, Range 425 – 1746 m
Slope: Mean 5°, Range 0 – 40°
Aspect: Variable

Tree Cover: 0.0%
Shrub Cover: Mean 10.2%, Range 2 – 32%
Herb Cover: Mean 8.4%, Range 0 – 47%

**Surface Covers:**
Large Rock: Mean 0.1%, Range 0.0 –1%
Small Rock: Mean 14.1%, Range 0 – 58%
Fines: Mean 65.1%, Range 0 – 96%
Litter: Mean 10.2%, Range 0 – 93%

**Conservation Status Rank: Global** G5; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | **12** | **1** | **15** | **14** | | **3** |

**Surveys Used in Description (N = 45):** BLK021_a, BLK040_d, BLK096_a, DEVA0919, DEVA9115, DEVAD217, FIR1211071027, FIR1211071150, FIR1211071206, FIR1211080959, FIR1211081022, FIR1211081038, FIR1211081052, FISH0009, FISH0048, FISH0054, FISH0056, FISH0067, FISH0068, FISH0074, FSP004_a, FSP004_d, FSP006_a, FSP006_d, LAW043_a, LAW062_a, LAW063_a, LAW065_a, LAW104_d, LNP018_a, OWVA0016, OWVA0028, OWVA0037, OWVA0038, PLC240_d, PLC246_d, SLTN0712, SLTN0783, TIN028_a, TIN028_d, TIN068_a, UHL052_d, UNW029_a, UNW072_d, ZOE1211081651

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Sarcobatus vermiculatus* | 82 | 30.1 | 3.2 | 0.2 | 15.0 | **x** | | **x** | **x** |
| | *Ericameria nauseosa* | 53 | 8.0 | 0.9 | 0.2 | 8.0 | | | | **x** |
| | *Atriplex torreyi* | 38 | 9.1 | 1.1 | 0.3 | 13.2 | | | | |
| | *Atriplex parryi* | 36 | 14.0 | 1.0 | 0.1 | 10.0 | | | | |
| | *Atriplex confertifolia* | 36 | 4.8 | 0.4 | 0.1 | 4.0 | | | | |
| | *Suaeda moquinii* | 31 | 4.1 | 0.5 | 0.1 | 4.0 | | | | |
| | *Chrysothamnus albidus* | 29 | 21.5 | 2.1 | 0.1 | 26.0 | | | | |
| | *Artemisia tridentata* | 20 | 2.8 | 0.2 | 0.1 | 2.7 | | | | |
| **Herb** | | | | | | | | | | |
| | *Distichlis spicata* | 71 | 23.5 | 1.0 | 0.1 | 6.0 | | | | **x** |
| | *Sporobolus airoides* | 56 | 18.1 | 1.0 | 0.1 | 9.4 | | | | **x** |
| | *Salsola* | 33 | 15.3 | 1.7 | 0.1 | 16.6 | | | | |
| | *Juncus arcticus* | 29 | 2.7 | 0.2 | 0.1 | 2.0 | | | | |
| | *Leymus cinereus* | 27 | 10.5 | 1.0 | 0.2 | 21.0 | | | | |
| | *Atriplex phyllostegia* | 20 | 1.8 | 0.3 | 0.1 | 4.4 | | | | |
| | *Cleomella obtusifolia* | 20 | 1.4 | 0.3 | 0.1 | 8.6 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Atriplex parryi* Provisional Association

**Common Name:** Parry's Saltbush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1058 m, Range 583 – 1284 m
Slope: Mean 2°, Range 0 – 3°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 7.4%, Range 3 – 15%
Herb Cover: Mean 3.6%, Range 0 – 12%

**Surface Covers:**
Large Rock: Mean 0.2%, Range 0.0 –1%
Small Rock: Mean 26.9%, Range 8 – 58%
Fines: Mean 63.2%, Range 1 – 91%
Litter: Mean 0.6%, Range 0 – 2%

**Surveys Used in Description (N = 8):** DEVA0919, DEVAD217, FISH0067, OWVA0016, OWVA0037, SLTN0783, UNW029_a, ZOE1211081651

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Atriplex parryi* | 100 | 74.7 | 5.3 | 3.0 | 10.0 | X | X | | X |
| | *Sarcobatus vermiculatus* | 50 | 12.4 | 0.9 | 1.0 | 3.0 | | | | X |
| | *Ericameria nauseosa* | 38 | 2.4 | 0.2 | 0.2 | 1.0 | | | | |
| | *Stephanomeria pauciflora* | 25 | 1.2 | 0.1 | 0.2 | 0.5 | | | | |
| | *Machaeranthera carnosa* | 25 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Distichlis spicata* | 63 | 40.2 | 1.5 | 0.2 | 5.0 | | | | X |
| | *Sporobolus airoides* | 25 | 6.7 | 0.8 | 0.2 | 6.0 | | | | |
| | *Atriplex phyllostegia* | 25 | 3.5 | 0.4 | 0.2 | 2.8 | | | | |
| | *Cleome lutea* | 25 | 15.0 | 0.2 | 0.2 | 1.0 | | | | |
| | *Salsola* | 25 | 12.1 | 0.2 | 0.2 | 1.0 | | | | |
| | *Cleomella obtusifolia* | 25 | 1.3 | 0.1 | 0.2 | 0.8 | | | | |

## *Chrysothamnus albidus* Provisional Association

**Common Name:** White-flowered Rabbitbrush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1202 m, Range 425 – 1288 m
Slope: Mean 11°, Range 0 – 40°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 10.2%, Range 3 – 26%
Herb Cover: Mean 8.2%, Range 3 – 15%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0.2%
Fines: Mean 64.8%, Range 3 – 91%
Litter: Mean 8.5%, Range 0 – 18%

**Surveys Used in Description (N = 11):** FIR1211071027, FIR1211071150, FIR1211071206, FIR1211080959, FIR1211081022, FIR1211081038, FIR1211081052, FISH0009, FISH0054, FISH0068, SLTN0712

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Chrysothamnus albidus* | 100 | 87.6 | 8.7 | 2.0 | 26.0 | X | X | | X |
| | *Sarcobatus vermiculatus* | 64 | 7.6 | 0.4 | 0.2 | 2.0 | | | | X |
| | *Atriplex parryi* | 27 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Distichlis spicata* | 100 | 26.4 | 1.8 | 0.2 | 6.0 | X | | | X |
| | *Leymus cinereus* | 82 | 28.1 | 1.8 | 0.2 | 7.0 | X | | | X |
| | *Juncus arcticus* | 82 | 10.1 | 0.7 | 0.2 | 2.0 | X | | | X |
| | *Sporobolus airoides* | 55 | 11.7 | 0.9 | 0.2 | 3.0 | | | | X |
| | *Spartina gracilis* | 27 | 8.5 | 0.6 | 0.2 | 4.0 | | | | |
| | *Pyrrocoma racemosa* | 27 | 0.7 | 0.1 | 0.2 | 0.2 | | | | |

## *Sarcobatus vermiculatus – Atriplex confertifolia – (Picrothamnus desertorum, Suaeda moquinii)* Association

**Common Name:** Greasewood – Shadscale – Bud Sagebrush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1187 m, Range 1166 – 1219 m
Slope: 1°
Aspect: Variable

Tree Cover: 0 %
Shrub Cover: Mean 9.7%, Range 2 – 17%
Herb Cover: Mean 1.1%, Range 0 – 2%

**Surface Covers:**
Large Rock: 0%
Small Rock: 12%
Fines: 83%
Litter: 4%

**Surveys Used in Description (N = 4):** BLK040_d, OWVA0028, PLC246_d, UHL052_d

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Sarcobatus vermiculatus* | 100 | 33.3 | 4.2 | 0.3 | 10.0 | X | | X | X |
| | *Atriplex confertifolia* | 100 | 35.2 | 2.1 | 1.0 | 3.1 | X | | X | X |
| | *Ericameria nauseosa* | 75 | 8.6 | 0.7 | 0.2 | 1.4 | X | | | X |
| | *Suaeda moquinii* | 75 | 3.3 | 0.4 | 0.2 | 0.7 | X | | | X |
| | *Atriplex torreyi* | 50 | 6.1 | 0.6 | 0.8 | 1.6 | | | | X |
| | *Stephanomeria* | 50 | 1.4 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Tetradymia axillaris* | 25 | 5.6 | 1.0 | 4.0 | 4.0 | | | | |
| | *Psorothamnus arborescens* | 25 | 2.8 | 0.5 | 2.0 | 2.0 | | | | |
| | *Artemisia tridentata* | 25 | 2.5 | 0.3 | 1.0 | 1.0 | | | | |
| | *Tetradymia glabrata* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Stephanomeria pauciflora* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Picrothamnus desertorum* | 25 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Tetradymia canescens* | 25 | 0.4 | 0.0 | 0.1 | 0.1 | | | | |
| **Herb** | | | | | | | | | | |
| | *Distichlis spicata* | 100 | 48.7 | 0.5 | 0.2 | 1.0 | X | | X | X |
| | *Sporobolus airoides* | 75 | 23.9 | 0.4 | 0.2 | 1.1 | X | | | X |
| | Forb (herbaceous, not grass nor grasslike) | 25 | 7.1 | 0.2 | 0.7 | 0.7 | | | | |
| | *Cleome* | 25 | 2.7 | 0.1 | 0.3 | 0.3 | | | | |
| | *Eriastrum* | 25 | 2.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cleome lutea* | 25 | 2.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus tectorum* | 25 | 2.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus rubens* | 25 | 2.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Schismus* | 25 | 2.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Salsola* | 25 | 6.2 | 0.0 | 0.1 | 0.1 | | | | |

## *Sarcobatus vermiculatus – Suaeda moquinii* Association

**Common Name:** Greasewood – Bush Seepweed Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1193 m, Range 1118 – 1303 m
Slope: Mean 3°, Range 2 – 3°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 12.4%, Range 5 – 18%
Herb Cover: Mean 1.0%, Range 0 – 2%

**Surface Covers:**
Large Rock: 0%
Small Rock: Mean 22.0%, Range 3 – 41%
Fines: Mean 74.5%, Range 57 – 92%
Litter: Mean 2.5%, Range 1 – 4%

**Surveys Used in Description (N = 5):** FISH0074, OWVA0038, PLC240_d, TIN028_a, UNW072_d

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | Standing snag | 20 | 20.0 | 0.4 | 2.0 | 2.0 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Sarcobatus vermiculatus* | 100 | 42.2 | 5.5 | 2.8 | 13.0 | X | | X | X |
| | *Suaeda moquinii* | 100 | 23.0 | 2.7 | 1.6 | 4.0 | X | | | X |
| | *Atriplex confertifolia* | 80 | 3.8 | 0.4 | 0.2 | 0.8 | X | | | X |
| | *Atriplex torreyi* | 60 | 22.8 | 3.0 | 4.5 | 5.6 | | | | X |
| | *Ericameria nauseosa* | 40 | 3.4 | 0.5 | 0.4 | 2.0 | | | | |
| | *Stephanomeria* | 40 | 0.4 | 0.1 | 0.1 | 0.2 | | | | |
| | *Psorothamnus arborescens* | 40 | 0.8 | 0.1 | 0.1 | 0.2 | | | | |
| | *Atriplex parryi* | 20 | 1.1 | 0.2 | 1.0 | 1.0 | | | | |
| | *Artemisia tridentata* | 20 | 1.2 | 0.2 | 0.9 | 0.9 | | | | |
| | *Atriplex canescens* | 20 | 0.3 | 0.0 | 0.2 | 0.2 | | | | |
| | *Psorothamnus polydenius* | 20 | 0.7 | 0.0 | 0.2 | 0.2 | | | | |
| | *Atriplex polycarpa* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Ephedra nevadensis* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Machaeranthera carnosa* | 20 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| **Herb** | | | | | | | | | | |
| | *Salsola* | 60 | 33.4 | 0.2 | 0.2 | 0.5 | | | | X |
| | *Distichlis spicata* | 40 | 14.1 | 0.2 | 0.3 | 0.7 | | | | |
| | *Sporobolus airoides* | 40 | 6.1 | 0.1 | 0.1 | 0.3 | | | | |
| | *Leymus cinereus* | 20 | 3.6 | 0.1 | 0.3 | 0.3 | | | | |
| | *Astragalus* | 20 | 6.7 | 0.0 | 0.2 | 0.2 | | | | |
| | *unknown Polemoniaceae* | 20 | 6.7 | 0.0 | 0.2 | 0.2 | | | | |
| | *Psathyrotes annua* | 20 | 6.7 | 0.0 | 0.2 | 0.2 | | | | |
| | *Bassia hyssopifolia* | 20 | 1.4 | 0.0 | 0.1 | 0.1 | | | | |
| | *Cleomella plocasperma* | 20 | 0.7 | 0.0 | 0.1 | 0.1 | | | | |
| | *Chorizanthe brevicornu* | 20 | 0.7 | 0.0 | 0.1 | 0.1 | | | | |
| | *Glycyrrhiza lepidota* | 20 | 20.0 | 0.0 | 0.1 | 0.1 | | | | |

## *Sarcobatus vermiculatus / Leymus cinereus* Association

**Common Name:** Greasewood / Ashy Ryegrass Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1515 m, Range 1284 – 1746 m
Slope: Mean 10°, Range 2 – 17°
Aspect: South-facing

Tree Cover: 0%
Shrub Cover: Mean 23.0%, Range 14 – 32%
Herb Cover: Mean 25.5%, Range 4 – 47%

**Surface Covers:**
Large Rock: 0%
Small Rock: Mean 9.6%, Range 6 – 13%
Fines: Mean 36.5%, Range 0 – 73%
Litter: Mean 52.0%, Range 11 – 93%

**Surveys Used in Description (N = 2):** DEVA9115, FISH0048

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Sarcobatus vermiculatus* | 100 | 38.4 | 10.0 | 5.0 | 15.0 | X | | X | X |
| | *Ericameria nauseosa* | 100 | 31.0 | 7.0 | 6.0 | 8.0 | X | | X | X |
| | *Ephedra nevadensis* | 100 | 0.9 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Atriplex canescens* | 50 | 9.0 | 3.0 | 6.0 | 6.0 | | | | X |
| | *Atriplex confertifolia* | 50 | 12.7 | 2.0 | 4.0 | 4.0 | | | | X |
| | *Lycium cooperi* | 50 | 4.5 | 1.5 | 3.0 | 3.0 | | | | X |
| | *Tetradymia glabrata* | 50 | 0.6 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Psorothamnus polydenius* | 50 | 0.6 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Opuntia basilaris* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Lycium andersonii* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Gutierrezia sarothrae* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Ericameria teretifolia* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Suaeda moquinii* | 50 | 0.6 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Artemisia tridentata* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Leymus cinereus* | 100 | 71.6 | 12.5 | 4.0 | 21.0 | X | X | | X |
| | *Distichlis spicata* | 100 | 2.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | Graminoid (grass or grasslike) | 50 | 11.4 | 5.0 | 10.0 | 10.0 | | | | X |
| | *Juncus* | 50 | 6.8 | 3.0 | 6.0 | 6.0 | | | | X |
| | *Bromus rubens* | 50 | 2.3 | 1.0 | 2.0 | 2.0 | | | | X |
| | *Lepidium lasiocarpum* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Phacelia vallis-mortae* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Stanleya* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Erodium cicutarium* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Chaenactis macrantha* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Mentzelia* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Vulpia* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Malacothrix glabrata* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Eriogonum palmerianum* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Hordeum murinum* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Gilia* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Eschscholzia glyptosperma* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Chaenactis fremontii* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Descurainia pinnata* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Thelypodium* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Bromus tectorum* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Sphaeralcea ambigua* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Achnatherum hymenoides* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Descurainia sophia* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Amsinckia* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Eriastrum* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Tridens muticus* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Phacelia fremontii* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |

## *Sarcobatus vermiculatus / Sporobolus airoides* Association

**Common Name:** Greasewood / Alkali Sacaton Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1194 m, Range 1121 – 1282 m
Slope: 1°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 11.0%, Range 3 – 23%
Herb Cover: Mean 4.4%, Range 0 – 12%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0%
Fines: 96%
Litter: 3%

**Surveys Used in Description (N = 9):** BLK021_a, FISH0056, FSP004_a, FSP004_d, FSP006_a, FSP006_d, LAW104_d, LNP018_a, TIN068_a

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Sarcobatus vermiculatus* | 100 | 54.7 | 5.4 | 2.8 | 12.3 | X | X | | X |
| | *Atriplex torreyi* | 78 | 20.8 | 2.9 | 1.0 | 13.2 | X | | | X |
| | *Ericameria nauseosa* | 78 | 10.2 | 1.2 | 0.2 | 3.0 | X | | | X |
| | *Atriplex confertifolia* | 44 | 1.8 | 0.2 | 0.1 | 1.3 | | | | |
| | *Suaeda moquinii* | 33 | 3.4 | 0.4 | 0.1 | 2.8 | | | | |
| | *Artemisia tridentata* | 33 | 1.9 | 0.3 | 0.1 | 1.5 | | | | |
| | *Atriplex parryi* | 33 | 1.9 | 0.2 | 0.2 | 1.0 | | | | |
| | *Machaeranthera carnosa* | 33 | 1.6 | 0.1 | 0.2 | 0.5 | | | | |
| **Herb** | | | | | | | | | | |
| | *Sporobolus airoides* | 100 | 49.2 | 1.7 | 0.1 | 4.5 | X | | X | X |
| | *Distichlis spicata* | 56 | 12.4 | 0.8 | 0.1 | 2.7 | | | | X |
| | *Salsola* | 44 | 20.1 | 0.5 | 0.3 | 2.0 | | | | |
| | *Cleomella obtusifolia* | 33 | 2.4 | 0.2 | 0.1 | 1.2 | | | | |
| | *Eriogonum maculatum* | 33 | 1.3 | 0.1 | 0.1 | 0.6 | | | | |
| | *Juncus arcticus* | 33 | 1.1 | 0.1 | 0.2 | 0.4 | | | | |
| | *Atriplex phyllostegia* | 22 | 1.5 | 0.2 | 0.1 | 1.5 | | | | |
| | *Cynodon dactylon* | 22 | 2.1 | 0.1 | 0.1 | 1.2 | | | | |

## *Sarcobatus vermiculatus* Disturbed Association

**Common Name:** Greasewood disturbed Association
**Classification Comments:** none

**Plot/Sample Data Summary:**
Elevation: Mean 1245 m, Range 1175 – 1266 m
Slope: no data
Aspect: no data

Tree Cover: 0 %
Shrub Cover: Mean 6.4%, Range 4 – 8%
Herb Cover: Mean 31.4%, Range 26 – 36%

**Surface Covers:**
Large Rock: no data
Small Rock: no data
Fines: no data
Litter: no data

**Surveys Used in Description (N = 5):** BLK096_a, LAW043_a, LAW062_a, LAW063_a, LAW065_a

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Sarcobatus vermiculatus* | 100 | 44.6 | 2.9 | 1.4 | 4.8 | X | | X | X |
| | *Ericameria nauseosa* | 100 | 24.4 | 1.6 | 0.6 | 3.4 | X | | | X |
| | *Atriplex torreyi* | 60 | 6.8 | 0.5 | 0.3 | 1.1 | | | | X |
| | *Iva axillaris* | 60 | 5.0 | 0.3 | 0.4 | 0.6 | | | | X |
| | *Ambrosia dumosa* | 60 | 3.9 | 0.3 | 0.1 | 0.8 | | | | X |
| | *Psorothamnus arborescens* | 40 | 1.6 | 0.1 | 0.1 | 0.4 | | | | |
| | *Artemisia tridentata* | 20 | 10.0 | 0.5 | 2.7 | 2.7 | | | | |
| | *Atriplex canescens* | 20 | 1.6 | 0.1 | 0.7 | 0.7 | | | | |
| | *Atriplex confertifolia* | 20 | 1.6 | 0.1 | 0.4 | 0.4 | | | | |
| | *Salsola* | 100 | 44.0 | 13.7 | 12.3 | 16.6 | X | | X | X |
| | *Bassia hyssopifolia* | 80 | 13.2 | 4.4 | 2.8 | 9.1 | X | | | X |
| | *Atriplex phyllostegia* | 80 | 4.9 | 1.5 | 0.1 | 4.4 | X | | | X |
| | *Cleomella obtusifolia* | 60 | 5.9 | 2.0 | 0.4 | 8.6 | | | | X |
| | *Chenopodium* | 60 | 0.7 | 0.2 | 0.1 | 0.6 | | | | X |
| | *Sporobolus airoides* | 40 | 7.6 | 2.0 | 0.4 | 9.4 | | | | |
| | *Marsilea* | 40 | 3.7 | 1.3 | 1.0 | 5.4 | | | | |
| | *Ambrosia acanthicarpa* | 40 | 2.7 | 0.8 | 1.3 | 2.5 | | | | |
| | *Heliotropium curassavicum* | 40 | 1.4 | 0.4 | 0.4 | 1.6 | | | | |
| | *Helianthus annuus* | 40 | 0.9 | 0.3 | 0.6 | 0.9 | | | | |
| | *Eriogonum* | 40 | 0.5 | 0.2 | 0.3 | 0.4 | | | | |
| | *Distichlis spicata* | 40 | 0.5 | 0.1 | 0.1 | 0.6 | | | | |
| | *Leptochloa fusca* | 40 | 0.4 | 0.1 | 0.3 | 0.3 | | | | |
| | *Carex* | 40 | 0.3 | 0.1 | 0.1 | 0.4 | | | | |
| | *Lepidium latifolium* | 40 | 0.3 | 0.1 | 0.1 | 0.4 | | | | |
| | *Atriplex truncata* | 40 | 0.3 | 0.1 | 0.1 | 0.4 | | | | |
| | *Amaranthus* | 20 | 4.8 | 1.6 | 7.8 | 7.8 | | | | |
| | *Halogeton glomeratus* | 20 | 2.9 | 1.0 | 5.2 | 5.2 | | | | |
| | *Cleomella parviflora* | 20 | 1.2 | 0.4 | 2.0 | 2.0 | | | | |
| | *Eriogonum maculatum* | 20 | 1.0 | 0.3 | 1.3 | 1.3 | | | | |
| | *Eleocharis palustris* | 20 | 0.8 | 0.3 | 1.3 | 1.3 | | | | |
| | *Eriogonum deflexum* | 20 | 0.4 | 0.1 | 0.7 | 0.7 | | | | |
| | *Eriogonum brachyanthum* | 20 | 0.4 | 0.1 | 0.6 | 0.6 | | | | |
| | *Polypogon monspeliensis* | 20 | 0.2 | 0.1 | 0.4 | 0.4 | | | | |

## *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 |
|---|---|---|
| *Suaeda moquinii* | 9 | CEGL001991 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 619 m, Range 9 – 1287 m
Slope: Mean 1°, Range 0 – 3°
Aspect: West-facing

Tree Cover: Mean 0.1%, Range 0 – 0.2%
Shrub Cover: Mean 5.0%, Range 2 – 12%
Herb Cover: Mean 1.0%, Range 0 – 2%

**Surface Covers:**
Large Rock: Mean 0.2%, Range 0.0 –2%
Small Rock: Mean 9.3%, Range 0 – 30%
Fines: Mean 85.7%, Range 58 – 100%
Litter: Mean 3.0%, Range 0 – 15%

**Conservation Status Rank: Global** G4; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | | **3** | **1** | | | **5** |

**Surveys Used in Description (N = 9):** DEVA9422, DEVA9639, DEVA9641, DEVA9817, DEVAS020, DEVAS026, DEVAS063, FISH0059, MOJC0721

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Sarcobatus vermiculatus* | 82 | 30.1 | 3.2 | 0.2 | 15.0 | **x** | | **x** | **x** |
| | *Ericameria nauseosa* | 53 | 8.0 | 0.9 | 0.2 | 8.0 | | | | **x** |
| | *Atriplex torreyi* | 38 | 9.1 | 1.1 | 0.3 | 13.2 | | | | |
| | *Atriplex parryi* | 36 | 14.0 | 1.0 | 0.1 | 10.0 | | | | |
| | *Atriplex confertifolia* | 36 | 4.8 | 0.4 | 0.1 | 4.0 | | | | |
| | *Suaeda moquinii* | 31 | 4.1 | 0.5 | 0.1 | 4.0 | | | | |
| | *Chrysothamnus albidus* | 29 | 21.5 | 2.1 | 0.1 | 26.0 | | | | |
| | *Artemisia tridentata* | 20 | 2.8 | 0.2 | 0.1 | 2.7 | | | | |
| **Herb** | | | | | | | | | | |
| | *Distichlis spicata* | 71 | 23.5 | 1.0 | 0.1 | 6.0 | | | | **x** |
| | *Sporobolus airoides* | 56 | 18.1 | 1.0 | 0.1 | 9.4 | | | | **x** |
| | *Salsola* | 33 | 15.3 | 1.7 | 0.1 | 16.6 | | | | |
| | *Juncus arcticus* | 29 | 2.7 | 0.2 | 0.1 | 2.0 | | | | |
| | *Leymus cinereus* | 27 | 10.5 | 1.0 | 0.2 | 21.0 | | | | |
| | *Atriplex phyllostegia* | 20 | 1.8 | 0.3 | 0.1 | 4.4 | | | | |
| | *Cleomella obtusifolia* | 20 | 1.4 | 0.3 | 0.1 | 8.6 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Vitis arizonica – Vitis girdiana* Shrubland Alliance

**Common Name:** Wild grape shrubland

**NVC Alliance Code:** A4162. *Vitis arizonica - Vitis girdiana* Wet Shrubland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Vitis girdiana* | 7 | CEPP006842 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1068 m, Range 684 – 1642 m
Slope: Mean 5°, Range 4 – 5°
Aspect: Variable

Tree Cover: Mean 0.4%, Range 0 – 1%
Shrub Cover: Mean 68.3%, Range 25 – 99%
Herb Cover: Mean 28.1%, Range 1 – 90%

**Surface Covers:**
Large Rock: Mean 10.5%, Range 0.0 –21%
Small Rock: Mean 20.0%, Range 0 – 40%
Fines: Mean 17.5%, Range 0 – 35%
Litter: Mean 46.5%, Range 2 – 91%

**Conservation Status Rank: Global** G3; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | | | | **2** | | | | **4** |

**Surveys Used in Description (N = 7):** DEVA8057, DEVA8058, DEVA8091, DEVA8092, DEVA8093, DEVA8094, JAWB0201

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Vitis girdiana* | 100 | 87.6 | 64.6 | 10.0 | 98.0 | x | x | | x |
| | *Baccharis sergiloides* | 25 | 0.4 | 0.3 | 0.2 | 2.0 | | | | |
| | *Pluchea sericea* | 25 | 0.2 | 0.2 | 0.2 | 1.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Phragmites australis* | 38 | 29.9 | 11.0 | 1.0 | 80.0 | | | | |
| | *Distichlis spicata* | 25 | 4.6 | 1.8 | 2.0 | 12.0 | | | | |
| | *Schoenoplectus americanus* | 25 | 6.8 | 1.4 | 4.0 | 7.0 | | | | |
| | *Amsinckia* | 25 | 4.2 | 0.1 | 0.2 | 0.2 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## HERBACEOUS VEGETATION

## *Anemopsis californica – Helianthus nuttallii – Solidago spectabilis* Herbaceous Alliance

**Common Name:** Yerba mansa – Nuttall's sunflower – Nevada goldenrod alkaline wet meadows

**NVC Alliance Code:** A4247. *Anemopsis californica - Helianthus nuttallii - Solidago spectabilis* Alkaline Wet Meadow Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Anemopsis californica* | 7 | |
| *Anemopsis californica – Juncus arcticus* var. *mexicanus* | 1 | |
| *Helianthus nuttallii* | 1 | |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1205 m, Range 955 – 1377 m
Slope: Mean 1°, Range 0 – 5°
Aspect: Variable

Tree Cover: Mean 0.1%, Range 0 – 1%
Shrub Cover: Mean 1.7%, Range 0 – 12%
Herb Cover: Mean 59.8%, Range 18 – 88%

**Surface Covers:**
Large Rock: 0.0%
Small Rock: Mean 0.2%, Range 0 – 1%
Fines: Mean 52.0%, Range 0 – 89%
Litter: Mean 23.6%, Range 0 – 80%

**Conservation Status Rank: Global** G3; **State (California)** S2

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | **7** | | **2** | | | |

**Surveys Used in Description (N = 9):** A1805231056, A1805231905, FISH0010, FISH0062, MAN060_a, OWVA0012, OWVA0015, OWVA0026, UNW031_a

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Atriplex torreyi* | 33 | 21.4 | 0.5 | 0.3 | 3.0 | | | | |
| | *Ericameria nauseosa* | 22 | 14.3 | 0.8 | 3.3 | 4.0 | | | | |
| | *Forestiera pubescens* | 22 | 5.5 | 0.4 | 0.1 | 3.8 | | | | |
| | *Rosa woodsii* | 22 | 1.9 | 0.1 | 0.2 | 1.0 | | | | |
| | *Salix exigua* | 22 | 6.5 | 0.0 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Anemopsis californica* | 89 | 45.6 | 28.2 | 9.3 | 60.0 | **x** | | **x** | **x** |
| | *Distichlis spicata* | 89 | 18.5 | 10.7 | 1.0 | 20.0 | **x** | | | **x** |
| | *Juncus mexicanus* | 78 | 3.6 | 2.1 | 0.3 | 6.0 | **x** | | | **x** |
| | *Nitrophila occidentalis* | 67 | 3.0 | 2.0 | 0.2 | 6.0 | | | | **x** |
| | *Glycyrrhiza lepidota* | 56 | 1.6 | 1.1 | 1.0 | 2.8 | | | | **x** |
| | *Carex* | 44 | 3.3 | 2.3 | 0.2 | 11.8 | | | | |
| | *Juncus arcticus* | 44 | 3.7 | 1.9 | 0.2 | 12.7 | | | | |
| | *Pyrrocoma racemosa* | 44 | 0.5 | 0.3 | 0.2 | 2.3 | | | | |
| | *Sporobolus airoides* | 33 | 3.1 | 2.3 | 2.0 | 9.6 | | | | |
| | *Leymus triticoides* | 33 | 1.1 | 0.9 | 0.2 | 6.1 | | | | |
| | *Carex praegracilis* | 22 | 2.7 | 1.7 | 0.3 | 15.0 | | | | |
| | *Lotus corniculatus* | 22 | 3.1 | 1.7 | 2.9 | 12.0 | | | | |
| | *Carex douglasii* | 22 | 1.5 | 1.2 | 5.0 | 5.7 | | | | |
| | *Helianthus nuttallii* | 22 | 2.3 | 1.1 | 0.2 | 10.0 | | | | |
| | *Spartina gracilis* | 22 | 1.6 | 1.0 | 0.2 | 9.0 | | | | |
| | *Helianthus annuus* | 22 | 0.5 | 0.4 | 0.8 | 2.9 | | | | |
| | *Triglochin* | 22 | 0.3 | 0.1 | 0.2 | 1.0 | | | | |
| | *Poa pratensis* | 22 | 0.1 | 0.1 | 0.2 | 0.4 | | | | |
| | *Cordylanthus maritimus* ssp. *canescens* | 22 | 0.1 | 0.1 | 0.2 | 0.3 | | | | |
| | *Polypogon monspeliensis* | 22 | 0.1 | 0.1 | 0.2 | 0.3 | | | | |
| | *Symphyotrichum* | 22 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Anemopsis californica* Provisional Association

**Common Name:** Yerba Mansa Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1201 m, Range 955 – 1377 m
Slope: no data
Aspect: no data

Tree Cover: 0%
Shrub Cover: Mean 2.1%, Range 0 – 12%
Herb Cover: Mean 55.9%, Range 18 – 75%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0%
Fines: Mean 44.5%, Range 0 – 89%
Litter: Mean 26.5%, Range 0 – 80%

**Surveys Used in Description (N = 7):** A1805231056, A1805231905, FISH0010, FISH0062, MAN060_a, OWVA0015, OWVA0026

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 29 | 18.3 | 1.0 | 3.3 | 4.0 | | | | |
| | *Atriplex torreyi* | 29 | 15.6 | 0.6 | 1.0 | 3.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Anemopsis californica* | 100 | 57.1 | 34.9 | 10.0 | 60.0 | X | X | | X |
| | *Distichlis spicata* | 86 | 21.0 | 11.3 | 3.0 | 20.0 | X | | | X |
| | *Nitrophila occidentalis* | 71 | 3.7 | 2.5 | 0.2 | 6.0 | | | | X |
| | *Juncus mexicanus* | 71 | 4.0 | 2.3 | 0.3 | 6.0 | | | | X |
| | *Glycyrrhiza lepidota* | 43 | 1.1 | 0.8 | 1.0 | 2.5 | | | | |
| | *Juncus arcticus* | 43 | 2.6 | 0.7 | 0.2 | 3.0 | | | | |
| | *Pyrrocoma racemosa* | 43 | 0.2 | 0.1 | 0.2 | 0.3 | | | | |
| | *Spartina gracilis* | 29 | 2.1 | 1.3 | 0.2 | 9.0 | | | | |
| | *Carex* | 29 | 0.6 | 0.5 | 0.2 | 3.0 | | | | |
| | *Triglochin* | 29 | 0.4 | 0.2 | 0.2 | 1.0 | | | | |
| | *Symphyotrichum* | 29 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |

## *Anemopsis californica – Juncus arcticus* var. *mexicanus* Association

**Common Name:** Yerba Mansa – Mexican Rush Association
**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: 1141 m
Slope: no data
Aspect: no data

Tree Cover: 0.9%
Shrub Cover: 0.4%
Herb Cover: 88%

**Surface Covers:**
Large Rock: no data
Small Rock: no data
Fines: no data
Litter: no data

**Surveys Used in Description (N = 1):** UNW031_a

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Salix laevigata* | 100 | 78.6 | 0.7 | 0.7 | 0.7 | X | X | | X |
| | *Salix gooddingii* | 100 | 21.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Shrub** | | | | | | | | | | |
| | *Atriplex torreyi* | 100 | 83.3 | 0.3 | 0.3 | 0.3 | X | X | | X |
| | *Forestiera pubescens* | 100 | 16.7 | 0.1 | 0.1 | 0.1 | X | | | X |
| **Herb** | | | | | | | | | | |
| | *Distichlis spicata* | 100 | 17.7 | 15.6 | 15.6 | 15.6 | X | | | X |
| | *Juncus arcticus* | 100 | 14.4 | 12.7 | 12.7 | 12.7 | X | | | X |
| | *Carex* | 100 | 13.3 | 11.8 | 11.8 | 11.8 | X | | | X |
| | *Sporobolus airoides* | 100 | 10.9 | 9.6 | 9.6 | 9.6 | X | | | X |
| | *Anemopsis californica* | 100 | 10.6 | 9.3 | 9.3 | 9.3 | X | | | X |
| | *Leymus triticoides* | 100 | 6.9 | 6.1 | 6.1 | 6.1 | X | | | X |
| | *Carex douglasii* | 100 | 6.5 | 5.7 | 5.7 | 5.7 | X | | | X |
| | *Helianthus annuus* | 100 | 3.3 | 2.9 | 2.9 | 2.9 | X | | | X |
| | *Lotus corniculatus* | 100 | 3.3 | 2.9 | 2.9 | 2.9 | X | | | X |
| | *Glycyrrhiza lepidota* | 100 | 3.2 | 2.8 | 2.8 | 2.8 | X | | | X |
| | *Pyrrocoma racemosa* | 100 | 2.6 | 2.3 | 2.3 | 2.3 | X | | | X |
| | *Trifolium* | 100 | 1.3 | 1.1 | 1.1 | 1.1 | X | | | X |
| | *Hordeum jubatum* | 100 | 1.0 | 0.9 | 0.9 | 0.9 | X | | | X |
| | *Nitrophila occidentalis* | 100 | 0.7 | 0.6 | 0.6 | 0.6 | X | | | X |
| | *Schedonorus pratensis* | 100 | 0.6 | 0.6 | 0.6 | 0.6 | X | | | X |
| | *Mentha* | 100 | 0.6 | 0.5 | 0.5 | 0.5 | X | | | X |
| | *Poa pratensis* | 100 | 0.5 | 0.4 | 0.4 | 0.4 | X | | | X |
| | *Juncus mexicanus* | 100 | 0.4 | 0.4 | 0.4 | 0.4 | X | | | X |
| | *Bassia hyssopifolia* | 100 | 0.4 | 0.3 | 0.3 | 0.3 | X | | | X |
| | *Poa palustris* | 100 | 0.4 | 0.3 | 0.3 | 0.3 | X | | | X |
| | *Polypogon monspeliensis* | 100 | 0.3 | 0.3 | 0.3 | 0.3 | X | | | X |
| | *Cynodon dactylon* | 100 | 0.3 | 0.3 | 0.3 | 0.3 | X | | | X |
| | *Carex praegracilis* | 100 | 0.3 | 0.3 | 0.3 | 0.3 | X | | | X |
| | *Cordylanthus maritimus* ssp. *canescens* | 100 | 0.3 | 0.3 | 0.3 | 0.3 | X | | | X |
| | *Chenopodium* | 100 | 0.2 | 0.2 | 0.2 | 0.2 | X | | | X |

## *Helianthus nuttallii* Provisional Association

**Common Name:** Nuttall's Sunflower Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: 1293 m
Slope: 5°
Aspect: Northeast-facing

Tree Cover: 0%
Shrub Cover: 0.2%
Herb Cover: 55%

**Surface Covers:**
Large Rock: 0%
Small Rock: 1%
Fines: 82%
Litter: 12%

**Surveys Used in Description (N = 1):** OWVA0012

**Association Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Erigeron concinnus* | 100 | 83.3 | 2.0 | 2.0 | 2.0 | X | X | | X |
| | *Salix exigua* | 100 | 8.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Rosa woodsii* | 100 | 8.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Herb** | | | | | | | | | | |
| | *Lotus corniculatus* | 100 | 24.7 | 12.0 | 12.0 | 12.0 | X | | | X |
| | *Helianthus nuttallii* | 100 | 20.6 | 10.0 | 10.0 | 10.0 | X | | | X |
| | *Carex* | 100 | 12.3 | 6.0 | 6.0 | 6.0 | X | | | X |
| | *Leymus cinereus* | 100 | 8.2 | 4.0 | 4.0 | 4.0 | X | | | X |
| | *Cirsium mohavense* | 100 | 8.2 | 4.0 | 4.0 | 4.0 | X | | | X |
| | *Sporobolus airoides* | 100 | 4.1 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Juncus mexicanus* | 100 | 4.1 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Schedonorus arundinaceus* | 100 | 4.1 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Glycyrrhiza lepidota* | 100 | 4.1 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Distichlis spicata* | 100 | 2.1 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Melilotus* | 100 | 2.1 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Sidalcea covillei* | 100 | 2.1 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Leymus triticoides* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Poa secunda* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Poa pratensis* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Polypogon monspeliensis* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Cleomella plocasperma* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Hordeum marinum* ssp. *gussoneanum* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Hordeum brachyantherum* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Eleocharis parishii* | 100 | 0.4 | 0.2 | 0.2 | 0.2 | X | | | X |

## *Aristida purpurea – Elymus elymoides – Poa secunda* Herbaceous Alliance

**Common Name:** Purple three-awn – squirreltail – curly blue grass patches

**NVC Alliance Code:** n/a.

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Poa secunda – Bromus rubens* | 2 | |
| *Poa secunda Shrub* post-burn | 4 | |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1466 m, Range 1162 – 1737 m
Slope: Mean 22°, Range 17 – 33°
Aspect: Mostly northeast-facing

Tree Cover: Mean 0.4%, Range 0 – 2%
Shrub Cover: Mean 2.7%, Range 0 – 5%
Herb Cover: Mean 15.3%, Range 2 – 50%

**Surface Covers:**
Large Rock: Mean 3.0%, Range 0.0 –15%
Small Rock: Mean 64.3%, Range 52 – 85%
Fines: Mean 12.5%, Range 0 – 40%
Litter: Mean 3.5%, Range 0 – 15%

**Conservation Status Rank: Global** GNR; **State (California)** SNR

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | **1** | **1** | **4** | | | | | | |

**Surveys Used in Description (N = 6):** JAWB0037, JAWB0205, SLTN0224, SLTN0424, SLTN0552, TEHA0121

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Purshia glandulosa* | 50 | 15.3 | 0.6 | 0.1 | 3.0 | | | | **x** |
| | *Ephedra viridis* | 50 | 7.8 | 0.4 | 0.1 | 2.0 | | | | **x** |
| | *Ephedra nevadensis* | 33 | 22.6 | 0.5 | 1.0 | 2.0 | | | | |
| | *Ericameria linearifolia* | 33 | 17.3 | 0.2 | 0.2 | 1.0 | | | | |
| | *Eriogonum fasciculatum* | 33 | 1.6 | 0.0 | 0.1 | 0.1 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Poa secunda* | 83 | 31.7 | 4.8 | 1.0 | 10.0 | **x** | | **x** | **x** |
| | *Cryptantha* | 50 | 7.0 | 1.9 | 0.1 | 10.0 | | | | **x** |
| | *Eriogonum* | 50 | 2.7 | 0.9 | 0.1 | 5.0 | | | | **x** |
| | *Amsinckia* | 50 | 2.7 | 0.3 | 0.1 | 1.0 | | | | **x** |
| | *Layia glandulosa* | 33 | 4.7 | 2.0 | 0.1 | 12.0 | | | | |
| | *Achnatherum speciosum* | 33 | 7.5 | 1.0 | 0.2 | 6.0 | | | | |
| | *Bromus rubens* | 33 | 2.2 | 0.2 | 0.2 | 1.0 | | | | |
| | *Bromus tectorum* | 33 | 1.2 | 0.2 | 0.1 | 1.0 | | | | |
| | *Elymus elymoides* | 33 | 0.4 | 0.1 | 0.1 | 0.2 | | | | |
| | *Coreopsis bigelovii* | 33 | 0.4 | 0.1 | 0.1 | 0.2 | | | | |
| | *Gilia* | 33 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |
| | *Eriophyllum* | 33 | 0.6 | 0.0 | 0.1 | 0.1 | | | | |
| | *Mentzelia albicaulis* | 33 | 0.6 | 0.0 | 0.1 | 0.1 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Poa secunda – Bromus rubens* Association

**Common Name:** Curly Bluegrass – Red Brome Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1296 m, Range 1162 – 1429 m
Slope: Mean 28°, Range 22 – 33°
Aspect: Northeast-facing

Tree Cover: Mean 0.2%, Range 0 – 0.4%
Shrub Cover: Mean 0.6%, Range 0 – 1%
Herb Cover: Mean 10.0%, Range 5 – 15%

**Surface Covers:**
Large Rock: Mean 7.5%, Range 0.0 –15%
Small Rock: Mean 66.5%, Range 65 – 68%
Fines: Mean 17.0%, Range 5 – 29%
Litter: Mean 10.0%, Range 5 – 15%

**Surveys Used in Description (N = 2):** JAWB0037, TEHA0121

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Juniperus californica* | 50 | 50.0 | 0.1 | 0.2 | 0.2 | | | | X |
| **Shrub** | | | | | | | | | | |
| | *Lotus scoparius* | 50 | 41.7 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Ericameria linearifolia* | 50 | 50.0 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Garrya flavescens* | 50 | 8.3 | 0.1 | 0.2 | 0.2 | | | | X |

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | |
| *Bromus rubens* | 100 | 6.6 | 0.6 | 0.2 | 1.0 | X | | | X |
| *Poa secunda* | 50 | 23.8 | 5.0 | 10.0 | 10.0 | | | | X |
| *Lupinus* | 50 | 18.3 | 1.5 | 3.0 | 3.0 | | | | X |
| *Bromus arenarius* | 50 | 7.1 | 1.5 | 3.0 | 3.0 | | | | X |
| *Lagophylla ramosissima* | 50 | 4.8 | 1.0 | 2.0 | 2.0 | | | | X |
| *Vulpia* | 50 | 2.9 | 0.6 | 1.2 | 1.2 | | | | X |
| *Perideridia pringlei* | 50 | 2.4 | 0.5 | 1.0 | 1.0 | | | | X |
| *Corethrogyne filaginifolia* | 50 | 6.1 | 0.5 | 1.0 | 1.0 | | | | X |
| *Galium hallii* | 50 | 6.1 | 0.5 | 1.0 | 1.0 | | | | X |
| *Lotus unifoliolatus* var. *unifoliolatus* | 50 | 2.4 | 0.5 | 1.0 | 1.0 | | | | X |
| unknown Apiaceae | 50 | 1.2 | 0.1 | 0.2 | 0.2 | | | | X |
| *Mimulus guttatus* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Plectritis ciliosa* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Selaginella* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Thysanocarpus curvipes* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Lomatium utriculatum* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Trifolium willdenovii* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Rigiopappus leptocladus* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Syntrichopappus fremontii* | 50 | 1.2 | 0.1 | 0.2 | 0.2 | | | | X |
| *Eriastrum brandegeeae* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Elymus elymoides* | 50 | 1.2 | 0.1 | 0.2 | 0.2 | | | | X |
| *Eriogonum* | 50 | 1.2 | 0.1 | 0.2 | 0.2 | | | | X |
| *Thysanocarpus laciniatus* | 50 | 1.2 | 0.1 | 0.2 | 0.2 | | | | X |
| *Erysimum capitatum* | 50 | 1.2 | 0.1 | 0.2 | 0.2 | | | | X |
| *Leptosiphon parviflorus* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Eriogonum saxatile* | 50 | 1.2 | 0.1 | 0.2 | 0.2 | | | | X |
| *Clarkia cylindrica* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Coreopsis bigelovii* | 50 | 1.2 | 0.1 | 0.2 | 0.2 | | | | X |
| *Camissonia kernensis* | 50 | 1.2 | 0.1 | 0.2 | 0.2 | | | | X |
| *Calochortus venustus* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Bromus hordeaceus* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Athysanus pusillus* | 50 | 0.5 | 0.1 | 0.2 | 0.2 | | | | X |
| *Achnatherum speciosum* | 50 | 1.2 | 0.1 | 0.2 | 0.2 | | | | X |
| *Cryptantha microstachys* | 50 | 1.2 | 0.1 | 0.2 | 0.2 | | | | X |
| **Non-vasc** | | | | | | | | | |
| Lichen | 50 | 48.8 | 19.6 | 39.2 | 39.2 | | | | X |
| Moss | 50 | 1.2 | 0.5 | 1.0 | 1.0 | | | | X |

## *Poa secunda* Shrub post-burn Provisional Association

**Common Name:** Curly Bluegrass Shrub post-burn Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1551 m, Range 1381 – 1737 m
Slope: Mean 19°, Range 17 – 24°
Aspect: Mostly northeast-facing

Tree Cover: Mean 0.5%, Range 0 – 2%
Shrub Cover: Mean 3.8%, Range 2 – 5%
Herb Cover: Mean 18.0%, Range 2 – 50%

**Surface Covers:**
Large Rock: Mean 0.8%, Range 0.0 –2%
Small Rock: Mean 63.3%, Range 52 – 85%
Fines: Mean 10.3%, Range 0 – 40%
Litter: Mean 0.3%, Range 0 – 1%

**Surveys Used in Description (N = 4):** JAWB0205, SLTN0224, SLTN0424, SLTN0552

**Association Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Yucca brevifolia* | 25 | 25.0 | 0.5 | 2.0 | 2.0 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Purshia glandulosa* | 75 | 23.0 | 0.9 | 0.1 | 3.0 | X | | | X |
| | *Ephedra viridis* | 75 | 11.7 | 0.6 | 0.1 | 2.0 | X | | | X |
| | *Ephedra nevadensis* | 50 | 33.9 | 0.8 | 1.0 | 2.0 | | | | X |
| | *Eriogonum fasciculatum* | 50 | 2.4 | 0.1 | 0.1 | 0.1 | | | | X |
| | *Salazaria mexicana* | 25 | 13.9 | 0.8 | 3.0 | 3.0 | | | | |
| | *Penstemon incertus* | 25 | 9.3 | 0.5 | 2.0 | 2.0 | | | | |
| | *Ericameria linearifolia* | 25 | 0.9 | 0.1 | 0.2 | 0.2 | | | | |
| | *Artemisia tridentata* | 25 | 1.0 | 0.0 | 0.1 | 0.1 | | | | |
| | *Ceanothus greggii* var. *vestitus* | 25 | 1.5 | 0.0 | 0.1 | 0.1 | | | | |
| | *Chrysothamnus* | 25 | 0.5 | 0.0 | 0.1 | 0.1 | | | | |
| | *Ericameria teretifolia* | 25 | 1.0 | 0.0 | 0.1 | 0.1 | | | | |
| | *Stephanomeria pauciflora* | 25 | 1.0 | 0.0 | 0.1 | 0.1 | | | | |

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | |
| *Poa secunda* | 100 | 35.6 | 4.8 | 1.0 | 10.0 | X | | X | X |
| *Cryptantha* | 75 | 10.5 | 2.8 | 0.1 | 10.0 | X | | | X |
| *Amsinckia* | 75 | 4.1 | 0.4 | 0.1 | 1.0 | X | | | X |
| *Layia glandulosa* | 50 | 7.0 | 3.0 | 0.1 | 12.0 | | | | X |
| *Eriogonum* | 50 | 3.4 | 1.3 | 0.1 | 5.0 | | | | X |
| *Bromus tectorum* | 50 | 1.8 | 0.3 | 0.1 | 1.0 | | | | X |
| *Gilia* | 50 | 1.3 | 0.1 | 0.1 | 0.1 | | | | X |
| *Eriophyllum* | 50 | 0.9 | 0.1 | 0.1 | 0.1 | | | | X |
| *Mentzelia albicaulis* | 50 | 0.9 | 0.1 | 0.1 | 0.1 | | | | X |
| *Gilia brecciarum* | 25 | 5.2 | 2.5 | 10.0 | 10.0 | | | | |
| *Achnatherum speciosum* | 25 | 10.7 | 1.5 | 6.0 | 6.0 | | | | |
| *Camissonia pallida* | 25 | 4.0 | 0.1 | 0.5 | 0.5 | | | | |
| Forb (herbaceous, not grass nor grasslike) | 25 | 1.3 | 0.1 | 0.3 | 0.3 | | | | |
| *Centrostegia thurberi* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| *Eriastrum sapphirinum* ssp. *sapphirinum* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| *Eriogonum baileyi* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| *Lupinus bicolor* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| *Eriogonum inflatum* | 25 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| *Plagiobothrys* | 25 | 0.4 | 0.0 | 0.1 | 0.1 | | | | |
| *Argemone munita* | 25 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Cryptantha micrantha* | 25 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |
| *Delphinium* | 25 | 0.4 | 0.0 | 0.1 | 0.1 | | | | |
| *Linanthus dichotomus* | 25 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |
| *Cryptantha circumscissa* | 25 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Arabis* | 25 | 0.4 | 0.0 | 0.1 | 0.1 | | | | |
| *Collinsia callosa* | 25 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |
| *Claytonia perfoliata* | 25 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |
| *Elymus elymoides* | 25 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Cistanthe monandra* | 25 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |
| *Eriastrum* | 25 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |
| *Anisocoma acaulis* | 25 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |
| *Mentzelia* | 25 | 0.4 | 0.0 | 0.1 | 0.1 | | | | |
| *Phlox stansburyi* | 25 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Phacelia* | 25 | 0.4 | 0.0 | 0.1 | 0.1 | | | | |
| *Monardella* | 25 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Lomatium nevadense* | 25 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Stephanomeria exigua* | 25 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |
| *Salvia columbariae* | 25 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |
| *Claytonia parviflora* | 25 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Eriogonum deflexum* | 25 | 0.4 | 0.0 | 0.1 | 0.1 | | | | |
| *Eriogonum nidularium* | 25 | 0.4 | 0.0 | 0.1 | 0.1 | | | | |
| *Coreopsis bigelovii* | 25 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| *Dichelostemma capitatum* | 25 | 0.8 | 0.0 | 0.1 | 0.1 | | | | |

## *Bolboschoenus maritimus* Herbaceous Alliance

**Common Name:** Salt marsh bulrush marshes

**NVC Alliance Code:** A3895. *Schoenoplectus americanus - Schoenoplectus acutus - Schoenoplectus californicus* Marsh Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Bolboschoenus maritimus* | 1 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: 1097 m
Slope: 0°
Aspect: No data

Tree Cover: 0%
Shrub Cover: 0%
Herb Cover: 84%

**Surface Covers:**
Large Rock: 0.0%
Small Rock: 0.0%
Fines: 80.0%
Litter: 10.0%

**Conservation Status Rank: Global** G4; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | **1** | | | | | |

**Surveys Used in Description (N = 1):** OWVA0036

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bolboschoenus maritimus* | 100 | 75.2 | 63.0 | 63.0 | 63.0 | **x** | **x** | | **x** |
| | *Distichlis spicata* | 100 | 11.9 | 10.0 | 10.0 | 10.0 | **x** | | | **x** |
| | *Juncus mexicanus* | 100 | 4.8 | 4.0 | 4.0 | 4.0 | **x** | | | **x** |
| | *Poa secunda* | 100 | 3.6 | 3.0 | 3.0 | 3.0 | **x** | | | **x** |
| | *Typha* | 100 | 2.4 | 2.0 | 2.0 | 2.0 | **x** | | | **x** |
| | *Hordeum jubatum* | 100 | 1.2 | 1.0 | 1.0 | 1.0 | **x** | | | **x** |
| | *Symphyotrichum* | 100 | 0.2 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Polypogon monspeliensis* | 100 | 0.2 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Mimulus guttatus* | 100 | 0.2 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |
| | *Polypogon maritimus* | 100 | 0.2 | 0.2 | 0.2 | 0.2 | **x** | | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Bromus tectorum – Taeniatherum caput-medusae* Herbaceous Alliance

**Common Name:** Cheatgrass – medusahead grassland

**NVC Alliance Code:** A1814. *Bromus tectorum - Taeniatherum caput-medusae* Ruderal Annual Grassland Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Bromus tectorum* | 3 | CEGL003019 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1882 m, Range 1415 – 2224 m
Slope: Mean 9°, Range 6 – 10°
Aspect: East-facing

Tree Cover: 0%
Shrub Cover: Mean 2.3%, Range 1 – 5%
Herb Cover: Mean 85.3%, Range 21 – 100%

**Surface Covers:**
Large Rock: Mean 0.7%, Range 0.0 –1%
Small Rock: Mean 27.0%, Range 0 – 65%
Fines: Mean 57.0%, Range 20 – 85%
Litter: Mean 5.0%, Range 0 – 15%

**Conservation Status Rank: Global** GNA; **State (California)** SNA

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | **1** | | | | **2** | | |

**Surveys Used in Description (N = 3):** SLTN0603, SLTN1202, TEHA0116

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 67 | 9.2 | 0.7 | 1.0 | 1.0 | | | | **x** |
| | *Iva axillaris* | 33 | 29.9 | 4.0 | 12.0 | 12.0 | | | | |
| | *Prunus andersonii* | 33 | 13.3 | 0.7 | 2.0 | 2.0 | | | | |
| | *Purshia glandulosa* | 33 | 13.3 | 0.7 | 2.0 | 2.0 | | | | |
| | *Artemisia tridentata* | 33 | 33.3 | 0.3 | 1.0 | 1.0 | | | | |
| | *Brickellia desertorum* | 33 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |
| | *Lepidium fremontii* | 33 | 0.5 | 0.1 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 100 | 67.2 | 59.7 | 11.0 | 98.0 | **x** | **x** | | **x** |
| | *Erodium cicutarium* | 67 | 15.5 | 20.7 | 2.0 | 60.0 | | | | **x** |
| | *Sisymbrium* | 67 | 7.9 | 2.3 | 2.0 | 5.0 | | | | **x** |
| | *Eriogonum palmerianum* | 33 | 2.2 | 1.7 | 5.0 | 5.0 | | | | |
| | *Stephanomeria parryi* | 33 | 0.9 | 0.7 | 2.0 | 2.0 | | | | |
| | *Bromus rubens* | 33 | 3.0 | 0.7 | 2.0 | 2.0 | | | | |
| | *Descurainia pinnata* | 33 | 1.5 | 0.3 | 1.0 | 1.0 | | | | |
| | *Stanleya* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Erysimum capitatum* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum nudum* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum deflexum* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Epilobium canum* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Euthamia occidentalis* | 33 | 0.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *unknown Brassicaceae* | 33 | 0.0 | 0.0 | 0.1 | 0.1 | | | | |
| | *Cryptantha* | 33 | 0.0 | 0.0 | 0.1 | 0.1 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Corethrogyne filaginifolia – Eriogonum (elongatum, nudum)* Herbaceous Alliance

**Common Name:** Sand-aster and perennial buckwheat fields

**NVC Alliance Code:** A4238. *Corethrogyne filaginifolia - Eriogonum elongatum - Eriogonum nudum* Dry Meadow Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Lupinus excubitus – Mentzelia albicaulis – Eriogonum* spp. | 13 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1613 m, Range 1105 – 2130 m
Slope: Mean 20°, Range 3 – 48°
Aspect: Variable

Tree Cover: Mean 2.7%, Range 0 – 10%
Shrub Cover: Mean 7.7%, Range 0 – 28%
Herb Cover: Mean 41.7%, Range 0 – 77%

**Surface Covers:**
Large Rock: Mean 5.2%, Range 0.0 –28%
Small Rock: Mean 38.2%, Range 5 – 75%
Fines: Mean 21.5%, Range 0 – 85%
Litter: Mean 11.3%, Range 0 – 65%

**Conservation Status Rank: Global** G4; **State (California)** S4

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **7** | **5** | **1** | | | | | |

**Surveys Used in Description (N = 13):** CHIMSG76, ERSKDS21, ERSKJU34, ERSKMH55, ERSKSG61, ERSKSG62, ERSKSG63, JAWB0003, JAWB0019, SLTN0225, SLTN0226, SLTN0547, SLTN0941

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | Standing snag | 38 | 28.1 | 1.5 | 0.2 | 9.0 | | | | |
| | *Yucca brevifolia* | 38 | 16.7 | 0.6 | 0.2 | 3.0 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Lupinus excubitus* | 77 | 36.1 | 4.3 | 0.1 | 22.0 | **x** | | **x** | **x** |
| | *Ephedra viridis* | 38 | 12.4 | 0.7 | 0.2 | 4.0 | | | | |
| | *Ericameria nauseosa* | 38 | 3.2 | 0.5 | 0.2 | 4.0 | | | | |
| | *Lotus procumbens* | 31 | 2.8 | 0.3 | 0.2 | 2.0 | | | | |
| | *Opuntia basilaris* | 31 | 1.8 | 0.1 | 0.2 | 1.2 | | | | |
| | *Ephedra nevadensis* | 23 | 12.5 | 0.4 | 1.0 | 2.5 | | | | |
| | *Fremontodendron californicum* | 23 | 0.4 | 0.0 | 0.2 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Bromus tectorum* | 100 | 11.1 | 4.1 | 0.1 | 15.0 | **x** | | | **x** |
| | *Mentzelia albicaulis* | 92 | 15.5 | 7.4 | 0.1 | 35.0 | **x** | | | **x** |
| | *Stephanomeria exigua* | 77 | 2.2 | 1.2 | 0.2 | 4.4 | **x** | | | **x** |
| | *Achnatherum speciosum* | 69 | 1.3 | 0.7 | 0.1 | 2.0 | | | | **x** |
| | *Erodium cicutarium* | 62 | 5.3 | 2.0 | 0.1 | 8.4 | | | | **x** |
| | *Cryptantha circumscissa* | 62 | 3.6 | 1.8 | 0.2 | 8.0 | | | | **x** |
| | *Poa secunda* | 54 | 2.6 | 1.5 | 0.1 | 8.0 | | | | **x** |
| | *Leptosiphon aureus* | 54 | 2.8 | 1.2 | 0.2 | 5.0 | | | | **x** |
| | *Amsinckia* | 54 | 1.0 | 0.4 | 0.1 | 2.2 | | | | **x** |
| | *Eriophyllum* | 46 | 2.5 | 1.3 | 0.2 | 8.0 | | | | |
| | *Layia glandulosa* | 46 | 2.1 | 1.0 | 0.2 | 8.0 | | | | |
| | *Phacelia fremontii* | 46 | 0.7 | 0.2 | 0.2 | 2.0 | | | | |
| | *Chaenactis xantiana* | 38 | 2.4 | 0.9 | 0.2 | 5.0 | | | | |
| | *Anisocoma acaulis* | 38 | 2.0 | 0.8 | 0.2 | 6.0 | | | | |
| | *Bromus rubens* | 38 | 2.0 | 0.8 | 0.1 | 5.6 | | | | |
| | *Erigeron foliosus* | 38 | 0.6 | 0.3 | 0.2 | 2.0 | | | | |
| | *Eriogonum baileyi* | 31 | 1.9 | 0.9 | 2.0 | 5.0 | | | | |
| | *Linanthus parryae* | 31 | 1.2 | 0.6 | 0.2 | 4.0 | | | | |
| | *Camissonia campestris* | 31 | 0.7 | 0.4 | 0.2 | 4.0 | | | | |
| | *Elymus elymoides* | 31 | 0.4 | 0.1 | 0.1 | 1.0 | | | | |
| | *Delphinium* | 31 | 0.1 | 0.1 | 0.1 | 0.2 | | | | |
| | *Phacelia* | 31 | 1.2 | 0.0 | 0.1 | 0.2 | | | | |
| | *Cryptantha mohavensis* | 23 | 4.1 | 2.0 | 6.7 | 10.0 | | | | |
| | *Gilia latiflora* | 23 | 2.8 | 1.3 | 0.2 | 16.7 | | | | |
| | *Lupinus bicolor* | 23 | 0.9 | 0.5 | 0.2 | 4.0 | | | | |
| | *Gilia tricolor* | 23 | 1.0 | 0.5 | 0.2 | 3.3 | | | | |
| | *Eriastrum densifolium* | 23 | 0.5 | 0.2 | 0.1 | 2.6 | | | | |
| | *Mirabilis laevis* | 23 | 0.3 | 0.2 | 0.2 | 2.0 | | | | |
| | *Eriogonum* | 23 | 0.6 | 0.2 | 0.2 | 1.0 | | | | |
| | *Malacothrix glabrata* | 23 | 0.3 | 0.2 | 0.2 | 1.6 | | | | |
| | *Senecio flaccidus* | 23 | 0.7 | 0.1 | 0.2 | 1.0 | | | | |
| | *Nama demissum* | 23 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Phacelia tanacetifolia* | 23 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| | *Centrostegia thurberi* | 23 | 0.1 | 0.0 | 0.1 | 0.2 | | | | |
| | *Cryptantha* | 23 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Cressa truxillensis – Distichlis spicata* Herbaceous Alliance

**Common Name:** Alkali weed – salt grass playas and sinks

**NVC Alliance Code:** A4180. *Cressa truxillensis - Distichlis spicata* Vernal Pool Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Plagiobothrys parishii – Distichlis spicata* | 2 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1092 m, Range 1088 – 1096 m
Slope: 0°
Aspect: no data

Tree Cover: 0%
Shrub Cover: 0%
Herb Cover: Mean 50.0%, Range 30 – 70%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0%
Fines: Mean 77.5%, Range 75 – 80%
Litter: Mean 17.5%, Range 15 – 20%

**Conservation Status Rank: Global** G2; **State (California)** S2

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | **2** | | | | | |

**Surveys Used in Description (N = 2):** OWVA0018, OWVA0019

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Plagiobothrys parishii* | 100 | 43.4 | 24.0 | 18.0 | 30.0 | **x** | | **x** | **x** |
| | *Distichlis spicata* | 100 | 14.4 | 10.5 | 1.0 | 20.0 | **x** | | | **x** |
| | *Hordeum marinum* ssp. *gussoneanum* | 100 | 7.9 | 5.5 | 1.0 | 10.0 | **x** | | | **x** |
| | *Polypogon monspeliensis* | 100 | 2.2 | 1.6 | 0.2 | 3.0 | **x** | | | **x** |
| | *Deschampsia danthonioides* | 50 | 7.9 | 6.0 | 12.0 | 12.0 | | | | **x** |
| | *Eriogonum* | 50 | 6.6 | 2.5 | 5.0 | 5.0 | | | | **x** |
| | *Descurainia sophia* | 50 | 6.6 | 2.5 | 5.0 | 5.0 | | | | **x** |
| | *Hordeum jubatum* | 50 | 5.3 | 2.0 | 4.0 | 4.0 | | | | **x** |
| | *Eleocharis parishii* | 50 | 2.6 | 1.0 | 2.0 | 2.0 | | | | **x** |
| | *Carex praegracilis* | 50 | 0.7 | 0.5 | 1.0 | 1.0 | | | | **x** |
| | *Poa secunda* | 50 | 0.3 | 0.2 | 0.4 | 0.4 | | | | **x** |
| | *Polygonum aviculare* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Heliotropium curassavicum* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Chenopodium* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Cressa truxillensis* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Lotus micranthus* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Lactuca* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Juncus mexicanus* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Symphyotrichum* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *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* | 17 | CEGL001770 |
| *Distichlis spicata – (Scirpus nevadensis)* | 2 | CEGL001773 |
| *Distichlis spicata – Juncus arcticus* var. *balticus (J. arcticus* var. *mexicanus)* | 9 | CEPP006700 |
| *Distichlis spicata – Leymus triticoides* | 1 | |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1233 m, Range -74 – 2115 m
Slope: Mean 1°, Range 0 – 12°
Aspect: Variable

Tree Cover: Mean 1.4%, Range 0 – 18%
Shrub Cover: Mean 4.7%, Range 0 – 15%
Herb Cover: Mean 44.4%, Range 4 – 95%

**Surface Covers:**
Large Rock: Mean 0.4%, Range 0.0 –5%
Small Rock: Mean 4.1%, Range 0 – 30%
Fines: Mean 56.1%, Range 2 – 99%
Litter: Mean 8.4%, Range 0 – 63%

**Conservation Status Rank: Global** GNR; **State (California)** S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | **1** | **5** | **4** | **8** | **11** | | |

**Surveys Used in Description (N = 29):** A1805250913, BGP019_a, BGP031_a, BGP047_a, BLK143_a, DEVA0617, DEVA9193, DEVA9451, FIR1211081125, FIR1306241603, FISH0043, FISH0050, FISH0051, FSL051_a, FSL120_a, LAW108_a, LAW110_d, OWVA0017, OWVA0027, RYE1211061045, RYE1211061128, RYE1211061427, SLTN0514, SLTN0515, SLTN0762, SLTN1164, SLTN1199, TEHA0113, UNW079_a

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 41 | 23.2 | 2.1 | 0.2 | 15.0 | | | | |
| | *Atriplex torreyi* | 31 | 10.6 | 0.8 | 0.1 | 9.6 | | | | |
| | *Suaeda moquinii* | 24 | 2.7 | 0.0 | 0.1 | 0.2 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Distichlis spicata* | 100 | 62.9 | 25.1 | 1.0 | 65.0 | **x** | **x** | | **x** |
| | *Juncus arcticus* | 48 | 7.2 | 2.5 | 0.3 | 19.0 | | | | |
| | *Sporobolus airoides* | 31 | 5.5 | 1.8 | 2.5 | 8.9 | | | | |
| | *Polypogon monspeliensis* | 31 | 0.3 | 0.2 | 0.1 | 2.7 | | | | |
| | *Eleocharis palustris* | 24 | 2.2 | 1.2 | 0.1 | 14.4 | | | | |
| | *Leymus triticoides* | 24 | 1.5 | 0.8 | 0.1 | 10.0 | | | | |
| | *Juncus mexicanus* | 21 | 1.4 | 1.6 | 0.1 | 35.0 | | | | |
| | *Typha* | 21 | 1.4 | 1.0 | 0.2 | 20.8 | | | | |
| | *Glycyrrhiza lepidota* | 21 | 0.8 | 0.4 | 0.2 | 4.5 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Distichlis spicata* Association

**Common Name:** Salt Grass Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1175 m, Range -74 – 2115 m
Slope: Mean 1°, Range 0 – 3°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 6.8%, Range 0 – 15%
Herb Cover: Mean 39.2%, Range 4 – 77%

**Surface Covers:**
Large Rock: 0%
Small Rock: Mean 5.6%, Range 0 – 30%
Fines: Mean 62.7%, Range 2 – 99%
Litter: Mean 1.6%, Range 0 – 5%

**Surveys Used in Description (N = 17):** A1805250913, BGP031_a, BGP047_a, BLK143_a, DEVA0617, DEVA9193, FISH0050, FISH0051, FSL051_a, LAW108_a, LAW110_d, OWVA0027, SLTN0514, SLTN0515, SLTN0762, SLTN1164, UNW079_a

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 47 | 26.6 | 2.9 | 0.3 | 15.0 | | | | |
| | *Atriplex torreyi* | 41 | 14.6 | 1.1 | 0.1 | 9.6 | | | | |
| | *Suaeda moquinii* | 35 | 4.4 | 0.1 | 0.1 | 0.2 | | | | |
| | *Allenrolfea occidentalis* | 24 | 4.5 | 0.1 | 0.0 | 0.5 | | | | |
| **Herb** | | | | | | | | | | |
| | *Distichlis spicata* | 100 | 73.5 | 27.6 | 4.0 | 65.0 | X | X | | X |
| | *Sporobolus airoides* | 35 | 7.1 | 2.1 | 2.5 | 8.6 | | | | |
| | *Juncus arcticus* | 29 | 0.5 | 0.2 | 0.3 | 1.2 | | | | |
| | *Leymus triticoides* | 24 | 1.0 | 0.5 | 0.1 | 6.1 | | | | |
| | *Glycyrrhiza lepidota* | 24 | 0.8 | 0.4 | 0.2 | 4.5 | | | | |
| | *Nitrophila occidentalis* | 24 | 1.7 | 0.3 | 0.2 | 3.6 | | | | |
| | *Polypogon monspeliensis* | 24 | 0.1 | 0.1 | 0.1 | 0.7 | | | | |

## *Distichlis spicata – (Scirpus nevadensis)* Association

**Common Name:** Salt Grass – (Great Basin Bulrush) Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1594 m, Range 1090 – 2097 m
Slope: 0°
Aspect: Flat

Tree Cover: Mean 9.0%, Range 0 – 18%
Shrub Cover: Mean 4.5%, Range 0 – 9%
Herb Cover: Mean 72.0%, Range 65 – 79%

**Surface Covers:**
Large Rock: 0%
Small Rock: Mean 0.1%, Range 0 – 0.1%
Fines: Mean 60.0%, Range 40 – 80%
Litter: Mean 7.5%, Range 0 – 15%

**Surveys Used in Description (N = 2):** OWVA0017, SLTN1199

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | unknown Asteraceae | 50 | 50.0 | 0.5 | 1.0 | 1.0 | | | X | |
| **Herb** | | | | | | | | | | |
| | *Scirpus nevadensis* | 100 | 44.8 | 34.0 | 8.0 | 60.0 | X | | X | X | |
| | *Distichlis spicata* | 100 | 43.3 | 29.5 | 1.0 | 58.0 | X | | X | X | |
| | *Eleocharis macrostachya* | 50 | 8.4 | 6.5 | 13.0 | 13.0 | | | | X | |
| | *Juncus mexicanus* | 50 | 1.3 | 1.0 | 2.0 | 2.0 | | | | X | |
| | *Nitrophila occidentalis* | 50 | 0.7 | 0.5 | 1.0 | 1.0 | | | | X | |
| | *Eleocharis palustris* | 50 | 0.7 | 0.5 | 1.0 | 1.0 | | | | X | |
| | Forb (herbaceous, not grass nor grasslike) | 50 | 0.6 | 0.5 | 1.0 | 1.0 | | | | X | |

## *Distichlis spicata – Juncus arcticus* var*. balticus (J. arcticus* var*. mexicanus)* Association

**Common Name:** Baltic Rush – Salt Grass Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1237 m, Range 962 – 1284 m
Slope: Mean 1°, Range 0 – 2°
Aspect: no data

Tree Cover: 0%
Shrub Cover: Mean 2.0%, Range 0 – 8%
Herb Cover: Mean 47.1%, Range 15 – 95%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0%
Fines: Mean 41.5%, Range 5 – 78%
Litter: Mean 12.5%, Range 5 – 20%

**Surveys Used in Description (N = 9):** BGP019_a, DEVA9451, FIR1211081125, FIR1306241603, FISH0043, FSL120_a, RYE1211061045, RYE1211061128, RYE1211061427

### Association Stand Table:

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | |
| *Ericameria nauseosa* | 33 | 23.7 | 1.4 | 2.7 | 5.0 | | | | |
| *Atriplex torreyi* | 22 | 6.5 | 0.5 | 0.4 | 3.8 | | | | |
| **Herb** | | | | | | | | | |
| *Distichlis spicata* | 100 | 51.3 | 20.5 | 7.0 | 35.0 | X | X | | X |
| *Juncus arcticus* | 89 | 18.4 | 5.6 | 1.0 | 12.0 | X | | | X |
| *Polypogon monspeliensis* | 44 | 0.7 | 0.5 | 0.2 | 2.7 | | | | |
| *Eleocharis palustris* | 33 | 5.9 | 3.0 | 4.2 | 14.4 | | | | |
| *Solidago* | 33 | 2.1 | 2.8 | 0.2 | 25.0 | | | | |
| *Sporobolus airoides* | 33 | 4.1 | 1.9 | 2.6 | 8.9 | | | | |
| *Leymus cinereus* | 33 | 0.9 | 1.2 | 0.2 | 10.0 | | | | |
| *Cordylanthus maritimus ssp. canescens* | 33 | 1.2 | 0.8 | 0.2 | 5.5 | | | | |
| *Pyrrocoma racemosa* | 33 | 0.5 | 0.1 | 0.1 | 1.0 | | | | |
| *Hordeum jubatum* | 33 | 0.1 | 0.1 | 0.1 | 0.2 | | | | |
| *Juncus mexicanus* | 22 | 2.8 | 3.9 | 0.1 | 35.0 | | | | |
| *Bassia hyssopifolia* | 22 | 1.1 | 0.8 | 0.8 | 5.9 | | | | |
| *Typha* | 22 | 1.0 | 0.7 | 2.6 | 3.8 | | | | |
| *Carex* | 22 | 0.8 | 0.6 | 1.1 | 4.2 | | | | |
| *Leymus triticoides* | 22 | 0.8 | 0.6 | 2.0 | 3.3 | | | | |
| *Glycyrrhiza lepidota* | 22 | 1.0 | 0.4 | 2.0 | 2.0 | | | | |
| *Muhlenbergia asperifolia* | 22 | 1.1 | 0.4 | 1.4 | 2.0 | | | | |
| *Lepidium latifolium* | 22 | 0.2 | 0.1 | 0.3 | 1.1 | | | | |
| *Spartina gracilis* | 22 | 0.5 | 0.1 | 0.2 | 1.0 | | | | |
| *Atriplex truncata* | 22 | 0.2 | 0.1 | 0.2 | 1.0 | | | | |
| *Chenopodium* | 22 | 0.1 | 0.1 | 0.1 | 0.4 | | | | |
| *Helianthus nuttallii* | 22 | 0.2 | 0.0 | 0.2 | 0.2 | | | | |
| *Helianthus annuus* | 22 | 0.1 | 0.0 | 0.2 | 0.2 | | | | |
| *Atriplex phyllostegia* | 22 | 0.0 | 0.0 | 0.1 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | |
| Algae | 22 | 22.2 | 2.8 | 0.2 | 25.0 | | | | |

## *Distichlis spicata – Leymus triticoides* Association

**Common Name:** Salt Grass – Creeping Rye Grass Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: 1460 m
Slope: 12°
Aspect: Southeast-facing

Tree Cover: 0%
Shrub Cover: 0%
Herb Cover: 55%

**Surface Covers:**
Large Rock: 5%
Small Rock: 7%
Fines: 18%
Litter: 63%

**Surveys Used in Description (N = 1):** TEHA0113

**Association Stand Table:**

| Layer Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | |
| *Pinus sabiniana* | 100 | 50.0 | 0.2 | 0.2 | 0.2 | X | X | | X |
| *Salix laevigata* | 100 | 50.0 | 0.2 | 0.2 | 0.2 | X | X | | X |
| **Shrub** | | | | | | | | | |
| *Iva axillaris* | 100 | 83.3 | 2.0 | 2.0 | 2.0 | X | X | | X |
| *Baccharis salicifolia* | 100 | 8.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Ericameria nauseosa* | 100 | 8.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Herb** | | | | | | | | | |
| *Juncus arcticus* | 100 | 33.1 | 19.0 | 19.0 | 19.0 | X | | X | X |
| *Distichlis spicata* | 100 | 26.1 | 15.0 | 15.0 | 15.0 | X | | | X |
| *Euthamia occidentalis* | 100 | 20.9 | 12.0 | 12.0 | 12.0 | X | | | X |
| *Leymus triticoides* | 100 | 17.4 | 10.0 | 10.0 | 10.0 | X | | | X |
| *Lactuca* | 100 | 0.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Typha* | 100 | 0.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Juncus* | 100 | 0.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Castilleja* | 100 | 0.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Polypogon monspeliensis* | 100 | 0.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Cirsium cymosum* | 100 | 0.3 | 0.2 | 0.2 | 0.2 | X | | | X |
| *Asclepias fascicularis* | 100 | 0.3 | 0.2 | 0.2 | 0.2 | X | | | X |

## *Eleocharis* (*palustris, rostellata*) Alkaline-Saline Herbaceous Alliance

**Common Name:** Common spikerush and beaked spikerush marshes

**NVC Alliance Code:** A3930. *Eleocharis palustris - Eleocharis rostellata* Alkaline-Saline Marsh Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Eleocharis rostellata* | 6 | CEGL003428 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1422 m, Range 1283 – 1749 m
Slope: Mean 7°, Range 0 – 27°
Aspect: South-east facing

Tree Cover: 0%
Shrub Cover: Mean 0.1%, Range 0 – 0.2%
Herb Cover: Mean 57.6%, Range 18 – 100%

**Surface Covers:**
Large Rock: Mean 0.5%, Range 0.0 –2%
Small Rock: 0%
Fines: Mean 16.8%, Range 0 – 50%
Litter: Mean 40.5%, Range 0 – 82%

**Conservation Status Rank: Global** G3; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | | | **4** | | | **2** |

**Surveys Used in Description (N = 6):** DEVA8052, FIR1211080839, FISH0007, FISH0046, FISH0049, SLTN0980

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Eleocharis rostellata* | 83 | 66.0 | 31.3 | 17.0 | 72.0 | x | x | | x |
| | *Juncus arcticus* | 67 | 9.6 | 4.5 | 1.0 | 16.0 | | | | x |
| | *Solidago* | 67 | 4.0 | 3.9 | 0.2 | 14.0 | | | | x |
| | *Apocynum cannabinum* | 50 | 1.1 | 0.6 | 0.2 | 3.0 | | | | x |
| | *Symphyotrichum* | 33 | 1.1 | 0.5 | 0.2 | 3.0 | | | | |
| | *Muhlenbergia asperifolia* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Juncus arcticus* (var*. balticus, mexicanus*) Herbaceous Alliance

**Common Name:** Baltic and Mexican rush marshes

**NVC Alliance Code:** A1374. Juncus arcticus ssp. littoralis - Juncus mexicanus Wet Meadow Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Juncus arcticus* var. *balticus – (*var*. mexicanus)* | 9 | CEGL003486 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1411 m, Range 523 – 2522 m
Slope: Mean 1°, Range 0 – 5°
Aspect: North-east facing

Tree Cover: 0%
Shrub Cover: 0%
Herb Cover: Mean 70.2%, Range 10 – 100%

**Surface Covers:**
Large Rock: 0%
Small Rock: Mean 1.7%, Range 0 – 10%
Fines: Mean 49.3%, Range 10 – 94%
Litter: Mean 16.0%, Range 0 – 85%

**Conservation Status Rank: Global** G5; **State (California)** S4

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | **2** | | **2** | **2** | **2** | | **1** |

**Surveys Used in Description (N = 9):** DEVA8056, DEVA8097, DEVA8098, FISH0041, FISH0042, SLTN0327, SLTN0383, SLTN1195, TEHA0038

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Juncus mexicanus* | 100 | 53.9 | 40.8 | 5.0 | 70.0 | x | x | | x |
| | *Iris missouriensis* | 33 | 0.6 | 0.7 | 0.1 | 3.0 | | | | |
| | *Leymus triticoides* | 33 | 0.5 | 0.3 | 0.2 | 2.0 | | | | |
| | Forb (herbaceous, not grass nor grasslike) | 33 | 0.4 | 0.3 | 0.2 | 2.0 | | | | |
| | *Sporobolus airoides* | 22 | 7.9 | 6.3 | 25.0 | 32.0 | | | | |
| | *Arnica* | 22 | 1.9 | 2.2 | 0.1 | 20.0 | | | | |
| | *Epilobium* | 22 | 1.4 | 1.7 | 0.2 | 15.0 | | | | |
| | *Achillea millefolium* | 22 | 1.0 | 1.1 | 0.1 | 10.0 | | | | |
| | *Solidago* | 22 | 0.6 | 0.5 | 0.2 | 4.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Mimulus* (*guttatus*) Herbaceous Alliance

**Common Name:** Common monkey flower seeps

**NVC Alliance Code:** A3812. Mimulus spp. - Primula parryi - Dodecatheon redolens Wet Meadow Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Mimulus guttatus – (Mimulus* spp.*)* | 3 | CEGL005305 |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1296 m, Range 1218 – 1406 m
Slope: Mean 9°, Range 4 – 13°
Aspect: North-facing

Tree Cover: Mean 0.0%, Range 0 – 0%
Shrub Cover: Mean 0.3%, Range 0 – 1%
Herb Cover: Mean 65.0%, Range 50 – 75%

**Surface Covers:**
Large Rock: Mean 35.2%, Range 35.2 –35%
Small Rock: Mean 11.0%, Range 11 – 11%
Fines: Mean 45.0%, Range 45 – 45%
Litter: Mean 1.0%, Range 1 – 1%

**Conservation Status Rank: Global** G4?; **State (California)** S3?

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **2** | **1** | | | | | | |

**Surveys Used in Description (N = 3):** D06021510, JAWB0023, TEHA0127

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ribes roezlii* | 33 | 33.3 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Nasturtium officinale* | 100 | 21.0 | 15.0 | 1.0 | 40.0 | **x** | | | **x** |
| | *Mimulus guttatus* | 100 | 17.4 | 11.7 | 10.0 | 15.0 | **x** | | | **x** |
| | *Urtica* | 100 | 14.4 | 8.5 | 0.2 | 25.0 | **x** | | | **x** |
| | *Juncus bufonius* | 67 | 7.2 | 5.0 | 5.0 | 10.0 | | | | **x** |
| | *Poa annua* | 67 | 2.0 | 1.3 | 2.0 | 2.0 | | | | **x** |
| | *Veronica anagallis-aquatica* | 67 | 0.7 | 0.4 | 0.2 | 1.0 | | | | **x** |
| | *Hordeum brachyantherum* | 67 | 0.2 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Polypogon monspeliensis* | 33 | 9.9 | 6.7 | 20.0 | 20.0 | | | | |
| | *Trifolium variegatum* | 33 | 7.4 | 5.0 | 15.0 | 15.0 | | | | |
| | *Polypogon interruptus* | 33 | 4.6 | 3.3 | 10.0 | 10.0 | | | | |
| | *Eleocharis acicularis* | 33 | 4.9 | 3.3 | 10.0 | 10.0 | | | | |
| | *Bromus diandrus* | 33 | 2.8 | 1.7 | 5.0 | 5.0 | | | | |
| | *Carex praegracilis* | 33 | 1.7 | 1.0 | 3.0 | 3.0 | | | | |
| | *Stellaria* | 33 | 1.7 | 1.0 | 3.0 | 3.0 | | | | |
| | *Bromus tectorum* | 33 | 1.1 | 0.7 | 2.0 | 2.0 | | | | |
| | *Juncus xiphioides* | 33 | 0.5 | 0.3 | 1.0 | 1.0 | | | | |
| | *Taraxacum officinale* | 33 | 0.6 | 0.3 | 1.0 | 1.0 | | | | |
| | *Claytonia perfoliata* | 33 | 0.6 | 0.3 | 1.0 | 1.0 | | | | |
| | *Pholistoma* | 33 | 0.6 | 0.3 | 1.0 | 1.0 | | | | |
| | *Bromus madritensis* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cirsium vulgare* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Zigadenus* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Stachys albens* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Sanicula crassicaulis* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Rumex crispus* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Ranunculus hebecarpus* | 33 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Moss | 33 | 33.3 | 0.7 | 2.0 | 2.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Monolopia (lanceolata) – Coreopsis (calliopsidea)* Herbaceous Alliance

**Common Name:** Monolopia – leafy-stemmed tickseed fields

**NVC Alliance Code:** n/a.

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Coreopsis bigelovii – Layia glandulosa – Mentzelia* spp. / *Ephedra nevadensis* | 5 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1433 m, Range 1280 – 1486 m
Slope: Mean 17°, Range 5 – 29°
Aspect: East-facing

Tree Cover: 0%
Shrub Cover: Mean 2.1%, Range 1 – 4%
Herb Cover: Mean 33.4%, Range 0 – 46%

**Surface Covers:**
Large Rock: Mean 2.1%, Range 0.0 –8%
Small Rock: Mean 55.0%, Range 50 – 60%
Fines: Mean 0.8%, Range 0 – 1%
Litter: Mean 0.1%, Range 0 – 0.2%

**Conservation Status Rank: Global** G3; **State (California)** S3

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | **3** | | **2** | | | | |

**Surveys Used in Description (N = 5):** SLTN0217, SLTN0218, SLTN0220, SLTN0221, SLTN0223

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ephedra nevadensis* | 60 | 46.1 | 1.0 | 1.0 | 2.0 | | | | **x** |
| | *Stephanomeria pauciflora* | 60 | 4.0 | 0.1 | 0.1 | 0.1 | | | | **x** |
| | *Psorothamnus arborescens* | 40 | 20.9 | 0.8 | 1.0 | 3.0 | | | | |
| | *Encelia actonii* | 40 | 8.7 | 0.3 | 0.5 | 1.0 | | | | |
| | *Purshia glandulosa* | 40 | 16.1 | 0.1 | 0.1 | 0.5 | | | | |
| | *Eriogonum fasciculatum* | 40 | 1.4 | 0.0 | 0.1 | 0.1 | | | | |
| | *Brickellia* | 20 | 2.9 | 0.0 | 0.1 | 0.1 | | | | |

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Mentzelia albicaulis* | 100 | 2.1 | 0.9 | 0.1 | 3.0 | **x** | | | **x** |
| | *Gilia brecciarum* | 100 | 0.2 | 0.1 | 0.1 | 0.1 | **x** | | | **x** |
| | *Layia glandulosa* | 80 | 7.1 | 2.8 | 0.1 | 12.0 | **x** | | | **x** |
| | *Phacelia* | 80 | 3.7 | 1.6 | 0.1 | 6.0 | **x** | | | **x** |
| | *Eriophyllum* | 80 | 1.0 | 0.4 | 0.1 | 1.0 | **x** | | | **x** |
| | *Bromus rubens* | 80 | 0.2 | 0.1 | 0.1 | 0.1 | **x** | | | **x** |
| | *Anisocoma acaulis* | 60 | 40.5 | 20.0 | 15.0 | 50.0 | | | | **x** |
| | *Coreopsis bigelovii* | 60 | 27.1 | 11.0 | 5.0 | 30.0 | | | | **x** |
| | *Salvia columbariae* | 60 | 4.9 | 2.1 | 0.1 | 10.0 | | | | **x** |
| | *Cryptantha micrantha* | 60 | 1.7 | 0.6 | 0.1 | 3.0 | | | | **x** |
| | *Cryptantha pterocarya* | 60 | 0.6 | 0.2 | 0.1 | 1.0 | | | | **x** |
| | *Linanthus dichotomus* | 60 | 0.4 | 0.2 | 0.1 | 1.0 | | | | **x** |
| | *Cryptantha* | 60 | 0.1 | 0.1 | 0.1 | 0.1 | | | | **x** |
| | *Poa secunda* | 60 | 0.1 | 0.1 | 0.1 | 0.1 | | | | **x** |
| | *Eriastrum* | 60 | 0.1 | 0.1 | 0.1 | 0.1 | | | | **x** |
| | *Eriogonum* | 60 | 0.1 | 0.1 | 0.1 | 0.1 | | | | **x** |
| | *Bromus tectorum* | 60 | 0.1 | 0.1 | 0.1 | 0.1 | | | | **x** |
| | *Lotus strigosus* | 40 | 2.5 | 1.1 | 0.5 | 5.0 | | | | |
| | *Erodium cicutarium* | 40 | 0.4 | 0.2 | 0.1 | 1.0 | | | | |
| | *Centrostegia thurberi* | 40 | 0.6 | 0.2 | 0.1 | 1.0 | | | | |
| | *Amsinckia* | 40 | 0.4 | 0.2 | 0.1 | 1.0 | | | | |
| | *Linanthus parryae* | 40 | 0.4 | 0.2 | 0.1 | 1.0 | | | | |
| | *Cistanthe monandra* | 40 | 0.6 | 0.2 | 0.1 | 1.0 | | | | |
| | *Eriogonum inflatum* | 40 | 0.3 | 0.1 | 0.1 | 0.5 | | | | |
| | *Caulanthus cooperi* | 40 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Vulpia* | 40 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Achnatherum speciosum* | 40 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Dichelostemma capitatum* | 40 | 0.1 | 0.0 | 0.1 | 0.1 | | | | |
| | *Mirabilis laevis* | 20 | 1.6 | 0.6 | 3.0 | 3.0 | | | | |
| | *Gilia cana* | 20 | 1.1 | 0.4 | 2.0 | 2.0 | | | | |
| | *Gilia* | 20 | 0.5 | 0.2 | 1.0 | 1.0 | | | | |
| | *Stephanomeria exigua* | 20 | 0.5 | 0.2 | 1.0 | 1.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Schoenoplectus (acutus, californicus)* Herbaceous Alliance

**Common Name:** Hardstem and California bulrush marshes

**NVC Alliance Code:** A3895. *Schoenoplectus americanus - Schoenoplectus acutus - Schoenoplectus californicus* Marsh Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Schoenoplectus acutus – Typha domingensis* | 1 | |
| *Schoenoplectus acutus* | 2 | |

**Classification Comments:**

**Plot/Sample Data Summary:**

Elevation: Mean 1311 m, Range 1171 – 1478 m
Slope: Mean 7°, Range 0 – 20°
Aspect: Variable

Tree Cover: Mean 0.1%, Range 0 – 0.2%
Shrub Cover: Mean 0.7%, Range 0 – 2%
Herb Cover: Mean 36.0%, Range 25 – 42%

**Surface Covers:**
Large Rock: Mean 0.7%, Range 0.0 –2%
Small Rock: Mean 1.3%, Range 0 – 4%
Fines: Mean 1.7%, Range 0 – 3%
Litter: Mean 40.7%, Range 2 – 70%

**Conservation Status Rank: Global** GNR; **State (California)** S3S4

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | **1** | **1** | | **1** | | | |

**Surveys Used in Description (N = 3):** FISH0022, OWVA0011, TEHA0114

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Salix laevigata* | 33 | 33.3 | 0.2 | 0.0 | 0.2 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Salix exigua* | 33 | 30.3 | 2.0 | 2.0 | 2.0 | | | | |
| | *Rosa woodsii* | 33 | 3.0 | 0.2 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Schoenoplectus acutus* | 100 | 50.7 | 13.7 | 8.0 | 25.0 | **x** | **x** | | |
| | *Asclepias fascicularis* | 67 | 0.4 | 0.1 | 0.2 | 0.2 | | | | **x** |
| | *Juncus arcticus* | 33 | 18.1 | 5.0 | 15.0 | 15.0 | | | | |
| | *Typha* | 33 | 11.6 | 4.0 | 12.0 | 12.0 | | | | |
| | *Lemna* | 33 | 9.6 | 3.3 | 10.0 | 10.0 | | | | |
| | *Eleocharis rostellata* | 33 | 3.6 | 1.0 | 3.0 | 3.0 | | | | |
| | *Nasturtium officinale* | 33 | 1.9 | 0.7 | 2.0 | 2.0 | | | | |
| | *Veronica anagallis-aquatica* | 33 | 1.0 | 0.3 | 1.0 | 1.0 | | | | |
| | *Euthamia occidentalis* | 33 | 1.2 | 0.3 | 1.0 | 1.0 | | | | |
| | *Epilobium* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Polygonum* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Melilotus* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Malvella leprosa* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Heliotropium curassavicum* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Glycyrrhiza lepidota* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Lactuca* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Anemopsis californica* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Grindelia camporum* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Algae | 33 | 33.3 | 2.0 | 6.0 | 6.0 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Schoenoplectus acutus* Association

**Common Name:** Common Tule Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1381 m, Range 1284 – 1478 m
Slope: Mean 10°, Range 0 – 20°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: 0%
Herb Cover: Mean 33.0%, Range 25 – 41%

**Surface Covers:**
Large Rock: Mean 1.0%, Range 0.0 –2%
Small Rock: Mean 2.0%, Range 0 – 4%
Fines: Mean 1.0%, Range 0 – 2%
Litter: Mean 60.0%, Range 50 – 70%

**Surveys Used in Description (N = 2):** FISH0022, TEHA0114

**Association Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Schoenoplectus acutus* | 100 | 64.5 | 16.5 | 8.0 | 25.0 | X | X | | X |
| | *Juncus arcticus* | 50 | 27.2 | 7.5 | 15.0 | 15.0 | | | | X |
| | *Eleocharis rostellata* | 50 | 5.4 | 1.5 | 3.0 | 3.0 | | | | X |
| | *Euthamia occidentalis* | 50 | 1.8 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Asclepias fascicularis* | 50 | 0.4 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Epilobium* | 50 | 0.4 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Lactuca* | 50 | 0.4 | 0.1 | 0.2 | 0.2 | | | | X |
| **Non vasc** | | | | | | | | | | |
| | Algae | 50 | 50.0 | 3.0 | 6.0 | 6.0 | | | | X |

## *Schoenoplectus acutus – Typha domingensis* Association

**Common Name:** Common Tule – Southern Cattail Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: 1171 m
Slope: 0°
Aspect: Flat

Tree Cover: 0.2%
Shrub Cover: 2%
Herb Cover: 42%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0%
Fines: 3%
Litter: 2%

**Surveys Used in Description (N = 1):** OWVA0011

**Association Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Salix laevigata* | 100 | 100. | 0.2 | 0.2 | 0.2 | X | X | | X |
| **Shrub** | | | | | | | | | | |
| | *Salix exigua* | 100 | 90.9 | 2.0 | 2.0 | 2.0 | X | X | | X |
| | *Rosa woodsii* | 100 | 9.1 | 0.2 | 0.2 | 0.2 | X | | | X |
| **Herb** | | | | | | | | | | |
| | *Typha* | 100 | 34.7 | 12.0 | 12.0 | 12.0 | X | | X | X |
| | *Lemna* | 100 | 28.9 | 10.0 | 10.0 | 10.0 | X | | | X |
| | *Schoenoplectus acutus* | 100 | 23.1 | 8.0 | 8.0 | 8.0 | X | | | X |
| | *Nasturtium officinale* | 100 | 5.8 | 2.0 | 2.0 | 2.0 | X | | | X |
| | *Veronica anagallis-aquatica* | 100 | 2.9 | 1.0 | 1.0 | 1.0 | X | | | X |
| | *Anemopsis californica* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Grindelia camporum* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Melilotus* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Polygonum* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Malvella leprosa* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Heliotropium curassavicum* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Glycyrrhiza lepidota* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Asclepias fascicularis* | 100 | 0.6 | 0.2 | 0.2 | 0.2 | X | | | X |

## *Schoenoplectus americanus* Herbaceous Alliance

**Common Name:** American bulrush marsh

**NVC Alliance Code:** A3895. *Schoenoplectus americanus - Schoenoplectus acutus - Schoenoplectus californicus* Marsh Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Schoenoplectus americanus* | 15 | CEGL001841 |
| *Schoenoplectus americanus – Schoenoplectus californicus – Schoenoplectus acutus* | 2 | |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 489 m, Range 60 – 1283 m
Slope: 0°
Aspect: no data

Tree Cover: 0%
Shrub Cover: 0%
Herb Cover: Mean 74.6%, Range 14 – 100%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0%
Fines: 0%
Litter: 20%

**Conservation Status Rank: Global** G5; **State (California)** S3

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | | **9** | **4** | | | **4** |

**Surveys Used in Description (N = 17):** DEVA8030, DEVA8031, DEVA8032, DEVA8033, DEVA8034, DEVA8035, DEVA8036, DEVA8037, DEVA8038, DEVA8039, DEVA8040, DEVA8041, DEVA8042, FIR1211080944, FISH0052, RYE1211061140, RYE1211061219

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Schoenoplectus americanus* | 100 | 76.5 | 60.1 | 5.0 | 100 | **x** | **x** | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Schoenoplectus americanus* Association

**Common Name:** Common Three-square Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 383 m, Range 60 – 1282 m
Slope: 0°
Aspect: no data

Tree Cover: 0%
Shrub Cover: 0%
Herb Cover: Mean 79.3%, Range 14 – 100%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0%
Fines: 0%
Litter: 20%

**Surveys Used in Description (N = 15):** DEVA8030, DEVA8031, DEVA8032, DEVA8033, DEVA8034, DEVA8035, DEVA8036, DEVA8037, DEVA8038, DEVA8039, DEVA8040, DEVA8041, DEVA8042, FISH0052, RYE1211061140

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | | |
| | *Schoenoplectus americanus* | 100 | 81.3 | 65.1 | 5.0 | 100. | X | X | | X |

## *Schoenoplectus americanus – Schoenoplectus californicus – Schoenoplectus acutus* Provisional Association

**Common Name:** Common Three-square – California Bulrush – Common Tule Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1282 m, Range 1281 – 1283 m
Slope: no data
Aspect: no data

Tree Cover: 0%
Shrub Cover: 0%
Herb Cover: Mean 38.8%, Range 15 – 63%

**Surface Covers:**
Large Rock: no data
Small Rock: no data
Fines: no data
Litter: no data

**Surveys Used in Description (N = 2):** FIR1211080944, RYE1211061219

### Association Stand Table:

| Taxon | Con | RelCov | Avg | Min | Max | Char | Dom | cDom | Often |
|---|---|---|---|---|---|---|---|---|---|
| **Herb** | | | | | | | | | |
| *Schoenoplectus americanus* | 100 | 40.7 | 23.0 | 18.0 | 28.0 | X | | X | X |
| *Schoenoplectus acutus* | 100 | 36.9 | 21.0 | 12.0 | 30.0 | X | | X | X |
| *Phragmites australis* | 50 | 20.2 | 11.0 | 22.0 | 22.0 | | | | X |
| *Typha* | 50 | 1.8 | 1.0 | 2.0 | 2.0 | | | | X |
| *Solidago* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |
| *Distichlis spicata* | 50 | 0.2 | 0.1 | 0.2 | 0.2 | | | | X |

## *Sporobolus airoides – Muhlenbergia asperifolia – Spartina gracilis* Herbaceous Alliance

**Common Name:** Alkali sacaton – scratchgrass – alkali cordgrass alkaline wet meadow

**NVC Alliance Code:** A1334. *Sporobolus airoides - Muhlenbergia asperifolia - Spartina gracilis* Alkaline Wet Meadow Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Spartina gracilis* | 2 | CEGL001588 |
| *Sporobolus airoides / Ericameria nauseosa* | 29 | |
| *Sporobolus airoides / Allenrolfea occidentalis* | 3 | |
| *Sporobolus airoides* | 6 | CEGL001688 |
| *Muhlenbergia asperifolia* | 7 | CEGL001779 |
| *Ivesia kingii – Spartina gracilis* | 15 | |
| *Sporobolus airoides – Distichlis spicata* | 16 | CEGL001687 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1227 m, Range 123 – 1411 m
Slope: Mean 0°, Range 0 – 2°
Aspect: Variable

Tree Cover: Mean 0.1%, Range 0 – 2%
Shrub Cover: Mean 4.9%, Range 0 – 22%
Herb Cover: Mean 25.9%, Range 3 – 88%

**Surface Covers:**
Large Rock: 0%
Small Rock: Mean 0.2%, Range 0 – 2%
Fines: Mean 78.1%, Range 15 – 98%
Litter: Mean 18.8%, Range 1 – 80%

**Conservation Status Rank: Global** G4; **State (California)** S2

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | **1** | **22** | **1** | **33** | **20** | | |

**Surveys Used in Description (N = 78):** A1805221137, BGP013_d, BGP094_a, BLK006_d, BLK069_a, BLK077_a, BLK093_a, BLK095_a, BLK099_a, BLK115_a, DEVA8090, FIR1211070906, FIR1211070945, FIR1211071042, FIR1211071125, FISH0001, FISH0002, FISH0005, FISH0006, FISH0013, FISH0045, FISH0061, FISH0063, FISH0065, FISH0066, FISH0069, FISH0071, FSL044_a, FSL048_a, FSL123_a, FSL126_a, FSL130_a, FSL166_a, FSL179_d, FSL187_a, FSP015_a, IND024_a, IND024_d, IND035_a, IND086_d, IND099_d, IND119_a, IND151_a, IND156_d, LAW072_a, LAW078_a, LAW107_a, LAW109_a, LAW120_a, LNP095_a, MAN006_a, MAN006_d, MAN034_a, OWVA0034, OWVA0043, PLC097_a, PLC121_a, PLC144_a, PLC263_d, POA1211081146, RYE1211061323, RYE1211061337, RYE1211061348, RYE1211061432, RYE1211061457, RYE1211061506, RYE1211071049, RYE1211071148, RYE1211071408, RYE1211071432, RYE1211080910, RYE1211080935, RYE1211081555, TEHA0118, TIN006_d, ZOE1211060909, ZOE1211071321, ZOE1211081527

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 56 | 23.7 | 1.9 | 0.2 | 9.3 | | | | **x** |
| | *Atriplex torreyi* | 50 | 13.8 | 1.3 | 0.1 | 14.3 | | | | **x** |
| | *Sarcobatus vermiculatus* | 37 | 4.2 | 0.3 | 0.1 | 2.2 | | | | |
| | *Allenrolfea occidentalis* | 24 | 10.5 | 0.3 | 0.1 | 4.8 | | | | |
| | *Atriplex confertifolia* | 23 | 3.3 | 0.2 | 0.1 | 2.0 | | | | |
| | *Stephanomeria* | 21 | 0.9 | 0.1 | 0.1 | 0.9 | | | | |
| **Herb** | | | | | | | | | | |
| | *Sporobolus airoides* | 81 | 36.6 | 10.0 | 0.2 | 50.0 | **x** | | **x** | **x** |
| | *Distichlis spicata* | 78 | 17.5 | 5.1 | 0.2 | 25.4 | **x** | | | **x** |
| | *Juncus arcticus* | 68 | 4.8 | 0.7 | 0.1 | 4.0 | | | | **x** |
| | *Glycyrrhiza lepidota* | 45 | 2.8 | 1.0 | 0.1 | 11.2 | | | | |
| | *Leymus triticoides* | 28 | 1.4 | 0.8 | 0.1 | 17.6 | | | | |
| | *Leymus cinereus* | 27 | 0.7 | 0.2 | 0.1 | 4.2 | | | | |
| | *Ivesia kingii* | 26 | 11.6 | 0.9 | 0.2 | 11.0 | | | | |
| | *Bassia hyssopifolia* | 23 | 1.8 | 0.8 | 0.1 | 11.3 | | | | |
| | *Cordylanthus maritimus* ssp. *canescens* | 23 | 0.7 | 0.2 | 0.1 | 3.7 | | | | |
| | *Salsola* | 22 | 2.4 | 0.7 | 0.2 | 10.6 | | | | |
| | *Atriplex phyllostegia* | 21 | 0.8 | 0.3 | 0.1 | 10.0 | | | | |
| | *Pyrrocoma racemosa* | 21 | 0.6 | 0.1 | 0.2 | 1.3 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Ivesia kingii – Spartina gracilis* Provisional Association

**Common Name:** King's Mousetail – Alkali Cordgrass Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1282 m, Range 1275 – 1286 m
Slope: Mean 1°, Range 0 – 2°
Aspect: no data

Tree Cover: 0%
Shrub Cover: Mean 0.2%, Range 0 – 1%
Herb Cover: Mean 8.5%, Range 3 – 15%

**Surface Covers:**
Large Rock: 0%
Small Rock: Mean 0.7%, Range 0 – 2%
Fines: Mean 94.3%, Range 93 – 96%
Litter: Mean 4.0%, Range 3 – 5%

**Surveys Used in Description (N = 15):** FIR1211071125, FISH0002, FISH0013, FISH0045, POA1211081146, RYE1211071049, RYE1211071148, RYE1211071408, RYE1211071432, RYE1211080910, RYE1211080935, RYE1211081555, ZOE1211060909, ZOE1211071321, ZOE1211081527

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Chrysothamnus albidus* | 33 | 30.0 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Ivesia kingii* | 100 | 59.2 | 4.4 | 1.0 | 11.0 | X | X | | X |
| | *Juncus arcticus* | 80 | 12.5 | 0.8 | 0.2 | 2.0 | X | | | X |
| | *Poa secunda* | 47 | 5.1 | 0.4 | 0.2 | 2.0 | | | | |
| | *Distichlis spicata* | 47 | 3.5 | 0.3 | 0.2 | 2.0 | | | | |
| | *Sporobolus airoides* | 47 | 4.0 | 0.2 | 0.2 | 1.0 | | | | |
| | *Spartina gracilis* | 47 | 2.0 | 0.1 | 0.2 | 1.0 | | | | |
| | *Pyrrocoma racemosa* | 40 | 1.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cirsium mohavense* | 40 | 1.3 | 0.1 | 0.2 | 0.2 | | | | |
| | *Sisyrinchium halophilum* | 33 | 3.0 | 0.3 | 0.2 | 3.0 | | | | |
| | *Muhlenbergia asperifolia* | 33 | 6.2 | 0.5 | 0.2 | 3.0 | | | | |

## *Muhlenbergia asperifolia* Provisional Association

**Common Name:** Scratchgrass Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1298 m, Range 1269 – 1411 m
Slope: Mean 1°, Range 0 – 1°
Aspect: no data

Tree Cover: 0%
Shrub Cover: Mean 0.2%, Range 0 – 1%
Herb Cover: Mean 39.9%, Range 15 – 72%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0%
Fines: Mean 31.5%, Range 15 – 48%
Litter: Mean 64.0%, Range 48 – 80%

**Surveys Used in Description (N = 7):** FIR1211070906, FIR1211071042, FISH0061, FISH0071, RYE1211061348, RYE1211061432, TEHA0118

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| **Herb** | | | | | | | | | | |
| | *Muhlenbergia asperifolia* | 100 | 48.7 | 20.0 | 6.0 | 40.0 | X | | X | X |
| | *Juncus arcticus* | 71 | 3.5 | 0.9 | 0.2 | 3.0 | | | | X |
| | *Solidago* | 57 | 7.6 | 3.0 | 0.2 | 10.0 | | | | X |
| | *Distichlis spicata* | 43 | 10.5 | 3.1 | 2.0 | 17.0 | | | | |
| | *Glycyrrhiza lepidota* | 43 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Schoenoplectus americanus* | 29 | 5.0 | 1.6 | 1.0 | 10.0 | | | | |
| | *Spartina gracilis* | 29 | 6.8 | 1.0 | 3.0 | 4.0 | | | | |
| | *Helianthus nuttallii* | 29 | 1.0 | 0.7 | 0.2 | 5.0 | | | | |
| | *Cirsium mohavense* | 29 | 0.4 | 0.2 | 0.2 | 1.0 | | | | |
| | *Sisyrinchium halophilum* | 29 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Symphyotrichum* | 29 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Leymus cinereus* | 29 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Leymus triticoides* | 29 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Pyrrocoma racemosa* | 29 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Puccinellia* | 29 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Castilleja minor* | 29 | 0.1 | 0.1 | 0.2 | 0.2 | | | | |

## *Spartina gracilis* Association

**Common Name:** Alkali Cordgrass Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1277 m, Range 1269 – 1285 m
Slope: 1°
Aspect: no data

Tree Cover: 0%
Shrub Cover: 0%
Herb Cover: Mean 23.3%, Range 9 – 38%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0.2%
Fines: 88%
Litter: 9%

**Surveys Used in Description (N = 2):** FIR1211070945, FISH0006

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Chrysothamnus albidus* | 50 | 50.0 | 0.1 | 0.2 | 0.2 | | | | X |
| **Herb** | | | | | | | | | | |
| | *Spartina gracilis* | 100 | 37.5 | 9.5 | 2.0 | 17.0 | X | | X | X |
| | *Distichlis spicata* | 100 | 7.4 | 2.1 | 0.2 | 4.0 | X | | | X |
| | *Pyrrocoma racemosa* | 100 | 5.5 | 0.6 | 0.2 | 1.0 | X | | | X |
| | *Sporobolus airoides* | 100 | 1.4 | 0.2 | 0.2 | 0.2 | X | | | X |
| | *Leymus triticoides* | 50 | 9.6 | 3.0 | 6.0 | 6.0 | | | | X |
| | *Juncus arcticus* | 50 | 20.8 | 2.0 | 4.0 | 4.0 | | | | X |
| | *Poa secunda* | 50 | 4.8 | 1.5 | 3.0 | 3.0 | | | | X |
| | *Eleocharis rostellata* | 50 | 5.2 | 0.5 | 1.0 | 1.0 | | | | X |
| | *Centaurium namophilum* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Equisetum* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Leymus cinereus* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Cirsium mohavense* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Asclepias* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Triglochin* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Ivesia kingii* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Glycyrrhiza lepidota* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Muhlenbergia asperifolia* | 50 | 0.3 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Cordylanthus maritimus* ssp. *canescens* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Nitrophila occidentalis* | 50 | 1.0 | 0.1 | 0.2 | 0.2 | | | | X |

## *Sporobolus airoides* Association

**Common Name:** Alkali Sacaton Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1040 m, Range 123 – 1284 m
Slope: 0°
Aspect: flat

Tree Cover: 0%
Shrub Cover: Mean 2.2%, Range 0 – 4%
Herb Cover: Mean 17.0%, Range 6 – 24%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0.1%
Fines: Mean 87.3%, Range 70 – 98%
Litter: Mean 9.8%, Range 1 – 25%

**Surveys Used in Description (N = 6):** DEVA8090, FISH0005, FISH0063, OWVA0034, OWVA0043, RYE1211061457

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 50 | 13.8 | 0.4 | 0.2 | 1.0 | | | | X |
| | *Atriplex confertifolia* | 33 | 9.6 | 0.4 | 0.2 | 2.0 | | | | |
| | *Allenrolfea occidentalis* | 33 | 25.0 | 0.2 | 0.2 | 1.0 | | | | |
| **Herb** | | | | | | | | | | |
| | *Sporobolus airoides* | 100 | 85.9 | 22.0 | 6.0 | 50.0 | X | X | | X |
| | *Atriplex phyllostegia* | 33 | 3.3 | 1.7 | 0.2 | 10.0 | | | | |
| | *Glycyrrhiza lepidota* | 33 | 3.1 | 0.5 | 0.2 | 3.0 | | | | |

## *Sporobolus airoides – Distichlis spicata* Association

**Common Name:** Alkali Sacaton – Salt Grass Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1232 m, Range 1145 – 1299 m
Slope: 0°
Aspect: no data

Tree Cover: 0%
Shrub Cover: Mean 4.0%, Range 0 – 10%
Herb Cover: Mean 33.9%, Range 7 – 88%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0%
Fines: 66%
Litter: 30%

**Surveys Used in Description (N = 16):** A1805221137, BGP094_a, BLK099_a, BLK115_a, FISH0069, FSL126_a, FSL166_a, FSL187_a, IND156_d, LAW120_a, MAN006_d, MAN034_a, RYE1211061323, RYE1211061337, RYE1211061506, TIN006_d

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Atriplex torreyi* | 63 | 22.8 | 1.2 | 0.1 | 6.2 | | | | X |
| | *Ericameria nauseosa* | 63 | 14.9 | 0.7 | 0.2 | 2.3 | | | | X |
| | *Sarcobatus vermiculatus* | 44 | 6.2 | 0.3 | 0.1 | 1.9 | | | | |
| | *Allenrolfea occidentalis* | 31 | 22.6 | 0.4 | 0.2 | 3.0 | | | | |
| | *Suaeda moquinii* | 31 | 2.8 | 0.2 | 0.1 | 1.3 | | | | |
| | *Atriplex confertifolia* | 25 | 5.5 | 0.3 | 0.2 | 1.9 | | | | |
| | *Machaeranthera carnosa* | 25 | 4.1 | 0.1 | 0.2 | 0.5 | | | | |
| **Herb** | | | | | | | | | | |
| | *Sporobolus airoides* | 100 | 45.3 | 14.2 | 4.5 | 33.0 | X | | X | X |
| | *Distichlis spicata* | 100 | 31.4 | 9.9 | 2.4 | 25.4 | X | | X | X |
| | *Juncus arcticus* | 63 | 2.9 | 0.7 | 0.1 | 3.0 | | | | X |
| | *Glycyrrhiza lepidota* | 56 | 4.1 | 2.0 | 0.2 | 11.2 | | | | X |
| | *Bassia hyssopifolia* | 31 | 1.7 | 1.0 | 1.5 | 4.0 | | | | |
| | *Cleomella obtusifolia* | 31 | 1.4 | 0.3 | 0.1 | 3.2 | | | | |
| | *Cleomella plocasperma* | 31 | 0.2 | 0.1 | 0.1 | 0.5 | | | | |
| | *Leymus triticoides* | 25 | 3.0 | 2.3 | 1.4 | 17.6 | | | | |
| | *Leymus cinereus* | 25 | 0.8 | 0.4 | 0.1 | 3.0 | | | | |
| | *Atriplex phyllostegia* | 25 | 0.6 | 0.2 | 0.1 | 1.2 | | | | |

## *Sporobolus airoides / Allenrolfea occidentalis* Association

**Common Name:** Alkali Sacaton / Iodine Bush Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1272 m, Range 1272 – 1273 m
Slope: 0°
Aspect: Mostly flat

Tree Cover: 0%
Shrub Cover: Mean 3.7%, Range 2 – 6%
Herb Cover: Mean 15.0%, Range 6 – 26%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0%
Fines: Mean 81.3%, Range 66 – 89%
Litter: Mean 15.0%, Range 7 – 30%

**Surveys Used in Description (N = 3):** FISH0001, FISH0065, FISH0066

**Association Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Allenrolfea occidentalis* | 100 | 74.7 | 2.3 | 2.0 | 3.0 | X | X | | X |
| | *Atriplex torreyi* | 67 | 3.1 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Rosa woodsii* | 33 | 20.2 | 1.3 | 4.0 | 4.0 | | | | |
| | *Sarcobatus vermiculatus* | 33 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Ericameria nauseosa* | 33 | 1.0 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Sporobolus airoides* | 100 | 58.9 | 10.3 | 4.0 | 18.0 | X | X | | X |
| | *Glycyrrhiza lepidota* | 100 | 19.2 | 4.1 | 0.2 | 7.0 | X | | | X |
| | *Distichlis spicata* | 100 | 5.1 | 0.8 | 0.2 | 2.0 | X | | | X |
| | *Juncus arcticus* | 100 | 2.6 | 0.5 | 0.2 | 1.0 | X | | | X |
| | *Ivesia kingii* | 67 | 5.3 | 0.4 | 0.2 | 1.0 | | | | X |
| | *Leymus cinereus* | 67 | 1.4 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Cordylanthus maritimus* ssp. *canescens* | 33 | 4.9 | 0.3 | 1.0 | 1.0 | | | | |
| | *Phragmites australis* | 33 | 1.2 | 0.3 | 1.0 | 1.0 | | | | |
| | *Nitrophila occidentalis* | 33 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| | *Pyrrocoma racemosa* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Iris missouriensis* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cirsium mohavense* | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |

## *Sporobolus airoides* / *Ericameria nauseosa* Association

**Common Name:** Alkali Sacaton / Rabbitbrush Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 1210 m, Range 1144 – 1401 m
Slope: no data
Aspect: no data

Tree Cover: Mean 1.3%, Range 1 – 2%
Shrub Cover: Mean 9.8%, Range 4 – 22%
Herb Cover: Mean 30.1%, Range 8 – 60%

**Surface Covers:**
Large Rock: no data
Small Rock: no data
Fines: no data
Litter: no data

**Surveys Used in Description (N = 29):** BGP013_d, BLK006_d, BLK069_a, BLK077_a, BLK093_a, BLK095_a, FSL044_a, FSL048_a, FSL123_a, FSL130_a, FSL179_d, FSP015_a, IND024_a, IND024_d, IND035_a, IND086_d, IND099_d, IND119_a, IND151_a, LAW072_a, LAW078_a, LAW107_a, LAW109_a, LNP095_a, MAN006_a, PLC097_a, PLC121_a, PLC144_a, PLC263_d

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria nauseosa* | 100 | 49.0 | 4.6 | 1.2 | 9.3 | X | | X | X |
| | *Atriplex torreyi* | 90 | 22.5 | 2.7 | 0.1 | 14.3 | X | | | X |
| | *Sarcobatus vermiculatus* | 69 | 5.1 | 0.4 | 0.1 | 2.2 | | | | X |
| | *Stephanomeria* | 45 | 2.3 | 0.2 | 0.1 | 0.9 | | | | |
| | *Atriplex confertifolia* | 41 | 3.9 | 0.3 | 0.1 | 1.4 | | | | |
| | *Artemisia tridentata* | 38 | 3.8 | 0.3 | 0.1 | 2.2 | | | | |
| | *Allenrolfea occidentalis* | 28 | 2.0 | 0.3 | 0.2 | 4.8 | | | | |
| | *Machaeranthera carnosa* | 28 | 2.5 | 0.2 | 0.1 | 1.7 | | | | |
| | *Atriplex parryi* | 28 | 1.1 | 0.1 | 0.1 | 1.3 | | | | |
| | *Suaeda moquinii* | 24 | 2.6 | 0.2 | 0.1 | 2.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Sporobolus airoides* | 100 | 47.4 | 13.4 | 2.8 | 36.3 | X | | X | X |
| | *Distichlis spicata* | 100 | 24.0 | 7.0 | 0.7 | 18.7 | X | | | X |
| | *Juncus arcticus* | 72 | 2.4 | 0.7 | 0.1 | 3.3 | | | | X |
| | *Glycyrrhiza lepidota* | 55 | 2.5 | 1.0 | 0.1 | 7.1 | | | | X |
| | *Leymus triticoides* | 48 | 1.4 | 0.7 | 0.1 | 11.3 | | | | |
| | *Salsola* | 45 | 6.3 | 1.8 | 0.3 | 10.6 | | | | |
| | *Bassia hyssopifolia* | 41 | 4.0 | 1.5 | 0.1 | 11.3 | | | | |
| | *Cordylanthus maritimus* ssp. *canescens* | 34 | 0.8 | 0.3 | 0.1 | 3.0 | | | | |
| | *Atriplex phyllostegia* | 34 | 1.1 | 0.3 | 0.1 | 2.9 | | | | |
| | *Atriplex truncata* | 34 | 0.6 | 0.2 | 0.1 | 2.1 | | | | |
| | *Leymus cinereus* | 34 | 0.8 | 0.2 | 0.1 | 4.2 | | | | |
| | *Cordylanthus* | 31 | 0.6 | 0.2 | 0.1 | 1.3 | | | | |
| | *Atriplex serenana* | 24 | 0.5 | 0.2 | 0.1 | 2.6 | | | | |
| | *Cleomella obtusifolia* | 24 | 0.2 | 0.0 | 0.1 | 0.3 | | | | |
| | *Carex* | 21 | 0.9 | 0.2 | 0.1 | 2.7 | | | | |
| | *Helianthus annuus* | 21 | 0.3 | 0.2 | 0.1 | 2.2 | | | | |

## *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* | 6 | CEPP006866 |
| *Typha domingensis* | 2 | CEGL001845 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 632 m, Range -79 – 1284 m
Slope: Mean 3°, Range 1 – 10°
Aspect: Mostly south-facing

Tree Cover: 0%
Shrub Cover: Mean 15.0%, Range 0 – 80%
Herb Cover: Mean 42.8%, Range 5 – 90%

**Surface Covers:**
Large Rock: 0%
Small Rock: Mean 0.2%, Range 0 – 1%
Fines: Mean 53.3%, Range 0 – 88%
Litter: Mean 28.3%, Range 0 – 99%

**Conservation Status Rank: Global** G5; **State (California)** S5

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | | | | **4** | **3** | | | **1** |

**Surveys Used in Description (N = 8):** DEVA0399, DEVA9620, FIR1211080856, MOJC0037, MOJC0045, MOJC0052, RYE1211061121, RYE1211061451

**Alliance Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Suaeda moquinii* | 25 | 16.7 | 0.1 | 0.2 | 0.5 | | | | |
| **Herb** | | | | | | | | | | |
| | ***Phragmites australis*** | **75** | **54.0** | **26.9** | **15.0** | **85.0** | **x** | **x** | | **x** |
| | *Distichlis spicata* | 75 | 14.2 | 5.8 | 0.5 | 20.0 | **x** | | | **x** |
| | *Sporobolus airoides* | 50 | 2.9 | 1.2 | 0.2 | 4.5 | | | | **x** |
| | ***Typha*** | **38** | **23.7** | **14.0** | **5.0** | **85.0** | | | | |
| | *Juncus cooperi* | 38 | 2.8 | 1.7 | 0.2 | 10.0 | | | | |
| | *Anemopsis californica* | 38 | 0.5 | 0.3 | 0.2 | 2.0 | | | | |
| | *Nitrophila occidentalis* | 25 | 0.2 | 0.1 | 0.2 | 0.5 | | | | |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Phragmites australis* ssp. *americanus* Provisional Association

**Common Name:** Native Common Reed Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 643 m, Range 60 – 1284 m
Slope: Mean 4°, Range 1 – 10°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 20.0%, Range 0 – 80%
Herb Cover: Mean 35.8%, Range 5 – 82%

**Surface Covers:**
Large Rock: 0.1%
Small Rock: Mean 0.3%, Range 0 – 1%
Fines: Mean 66.6%, Range 4 – 88%
Litter: Mean 10.5%, Range 0 – 29%

**Surveys Used in Description (N = 6):** DEVA9620, MOJC0037, MOJC0045, MOJC0052, RYE1211061121, RYE1211061451

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Suaeda moquinii* | 33 | 22.2 | 0.1 | 0.2 | 0.5 | | | | |
| Herb | | | | | | | | | | |
| | *Phragmites australis* | 100 | 72.0 | 35.9 | 15.0 | 85.0 | X | X | | X |
| | *Distichlis spicata* | 83 | 18.3 | 7.3 | 0.5 | 20.0 | X | | | X |
| | *Sporobolus airoides* | 50 | 3.8 | 1.5 | 1.5 | 4.5 | | | | X |
| | *Juncus cooperi* | 33 | 3.7 | 2.2 | 3.0 | 10.0 | | | | |
| | *Anemopsis californica* | 33 | 0.3 | 0.1 | 0.2 | 0.5 | | | | |
| | *Nitrophila occidentalis* | 33 | 0.3 | 0.1 | 0.2 | 0.5 | | | | |

## *Typha domingensis* Association

**Common Name:** Southern Cattail Association

**Classification Comments:** none

### Plot/Sample Data Summary:

Elevation: Mean 602 m, Range -79 – 1283 m
Slope: 1°
Aspect: Southeast-facing

Tree Cover: 0%
Shrub Cover: 0%
Herb Cover: Mean 63.8%, Range 38 – 90%

**Surface Covers:**
Large Rock: 0%
Small Rock: 0.2%
Fines: 0.2%
Litter: 99.4%

**Surveys Used in Description (N = 2):** DEVA0399, FIR1211080856

### Association Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Prosopis glandulosa* | 50 | 50.0 | 0.0 | 0.0 | 0.0 | | | | X |
| **Shrub** | | | | | | | | | | |
| | *Allenrolfea occidentalis* | 50 | 50.0 | 0.0 | 0.0 | 0.0 | | | | X |
| **Herb** | | | | | | | | | | |
| | *Typha* | 100 | 91.7 | 53.5 | 22.0 | 85.0 | X | X | | X |
| | *Distichlis spicata* | 50 | 1.7 | 1.5 | 3.0 | 3.0 | | | | X |
| | *Anemopsis californica* | 50 | 1.1 | 1.0 | 2.0 | 2.0 | | | | X |
| | *Schoenoplectus acutus* | 50 | 4.1 | 1.0 | 2.0 | 2.0 | | | | X |
| | *Schoenoplectus americanus* | 50 | 0.4 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Juncus cooperi* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Juncus arcticus* | 50 | 0.4 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Eleocharis rostellata* | 50 | 0.4 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Sporobolus airoides* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | X |

## SPARSE VEGETATION

## *Chorizanthe rigida – Geraea canescens* Desert Pavement Sparsely Vegetated Alliance

**Common Name:** Rigid spineflower - hairy desert sunflower Desert Pavement

**NVC Alliance Code:** A4024. *Chorizanthe rigida - Geraea canescens* Desert PavementAlliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Chorizanthe brevicornu – Stephanomeria pauciflora* | 2 | |

**Classification Comments:** The association circumscription is the same as that of the alliance.

### Plot/Sample Data Summary:

Elevation: Mean 1271 m, Range 1237 – 1305 m
Slope: Mean 13°, Range 1 – 25°
Aspect: Variable

Tree Cover: Mean 0%, Range 0 – 0%
Shrub Cover: Mean 4.0%, Range 1 – 7%
Herb Cover: Mean 62.5%, Range 40 – 85%

**Surface Covers:**
Large Rock: Mean 60.0%, Range 60 –60%
Small Rock: Mean 52.5%, Range 40 – 65%
Fines: Mean 0%, Range 0 – 0%
Litter: Mean 0%, Range 0 – 0%

**Conservation Status Rank: Global** G4; **State (California)** S4

### Surveys by Region:

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Samples | | | | **2** | | | | | **4** |

**Surveys Used in Description (N = 2):** OWVA0045, OWVA0047

### Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Psorothamnus arborescens* | 100 | 77.4 | 3.0 | 1.0 | 5.0 | x | x | | x |
| | *Ephedra viridis* | 100 | 22.6 | 1.1 | 0.2 | 2.0 | x | | | x |
| **Herb** | | | | | | | | | | |
| | *Chorizanthe brevicornu* | 100 | 36.0 | 32.5 | 15.0 | 50.0 | x | | x | x |
| | *Stephanomeria pauciflora* | 100 | 15.2 | 11.5 | 8.0 | 15.0 | x | | | x |
| | *Eriogonum inflatum* | 100 | 4.2 | 3.0 | 1.0 | 5.0 | x | | | x |
| | *Bromus rubens* | 50 | 14.9 | 15.0 | 30.0 | 30.0 | | | | x |
| | *Bromus madritensis* | 50 | 22.5 | 15.0 | 30.0 | 30.0 | | | | x |
| | *Mentzelia* | 50 | 5.0 | 5.0 | 10.0 | 10.0 | | | | x |
| | *Mirabilis* | 50 | 1.0 | 1.0 | 2.0 | 2.0 | | | | x |
| | *Descurainia sophia* | 50 | 1.1 | 0.8 | 1.5 | 1.5 | | | | x |
| | *Mirabilis laevis* | 50 | 0.1 | 0.1 | 0.2 | 0.2 | | | | x |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Ephedra viridis – Chrysothamnus viscidiflorus – Rhus trilobata* Sparsely Vegetated Alliance

**Common Name:** Mormon tea – sticky-flowered rabbitbrush – basket bush sparse scrub

**NVC Alliance Code:** A4050. *Ephedra viridis - Chrysothamnus viscidiflorus - Rhus trilobata* Talus Sparse Scrub Alliance

| Associations | Sample Size | NVC Code |
|---|---|---|
| *Ephedra viridis – Chrysothamnus viscidiflorus – Rhus trilobata* (alliance) | 3 | A4050 |
| *Ericameria cuneata* ssp. *spathulata* | 3 | CEPP006704 |

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1791 m, Range 1288 – 2568 m
Slope: Mean 34°, Range 12 – 52°
Aspect: Northwest-facing

Tree Cover: Mean 0.2%, Range 0 – 1%
Shrub Cover: Mean 4.8%, Range 1 – 11%
Herb Cover: Mean 0.5%, Range 0 – 1%

**Surface Covers:**
Large Rock: Mean 45.2%, Range 0.0 –98%
Small Rock: Mean 33.6%, Range 1 – 94%
Fines: Mean 1.5%, Range 0 – 5%
Litter: Mean 0.1%, Range 0 – 0.2%

**Conservation Status Rank: Global** GNR; **State (California)** SNR

**Surveys by Region:**

| Region | JAWB-N | JAWB-S | Other | OWVA | Other | FISH | Other | Other | Other |
|---|---|---|---|---|---|---|---|---|---|
| USDA Section | SN M261E | SN M261E | SN M261E | Mojave 322A | Mojave 322A | Mono 341D | Mono 341D | SNF M261F | SGB 341F |
| Sample size | | **1** | | **1** | | | | | **4** |

**Surveys Used in Description (N = 6):** DEVA9111, DEVA9138, DEVAS216, F1806061452, OWVA0023, SLTN0538

## Alliance Stand Table:

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tree** | | | | | | | | | | |
| | *Pinus monophylla* | 33 | 22.2 | 0.1 | 0.1 | 0.2 | | | | |
| **Shrub** | | | | | | | | | | |
| | *Ephedra viridis* | 67 | 10.6 | 0.3 | 0.1 | 1.0 | | | | **x** |
| | *Symphoricarpos longiflorus* | 50 | 16.9 | 1.4 | 0.1 | 6.0 | | | | **x** |
| | *Ericameria cuneata* | 50 | 16.0 | 1.2 | 1.0 | 4.0 | | | | **x** |
| | *Ericameria teretifolia* | 50 | 3.6 | 0.2 | 0.2 | 1.0 | | | | **x** |
| | *Gutierrezia microcephala* | 50 | 2.1 | 0.1 | 0.1 | 0.2 | | | | **x** |
| | *Fraxinus anomala* | 33 | 3.6 | 0.4 | 0.2 | 2.0 | | | | |
| | *Grayia spinosa* | 33 | 4.6 | 0.2 | 0.2 | 1.0 | | | | |
| | *Prunus fasciculata* | 33 | 2.3 | 0.2 | 0.2 | 1.0 | | | | |
| | *Brickellia longifolia* | 33 | 1.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Artemisia tridentata* | 33 | 3.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Eriogonum fasciculatum* | 33 | 1.4 | 0.1 | 0.1 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Elymus elymoides* | 50 | 10.4 | 0.1 | 0.1 | 0.2 | | | | **x** |
| | *Linanthus pungens* | 50 | 8.2 | 0.1 | 0.1 | 0.2 | | | | **x** |
| | Forb (herbaceous, not grass nor grasslike) | 33 | 12.9 | 0.1 | 0.2 | 0.3 | | | | |
| | *Achnatherum parishii* | 33 | 7.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Achnatherum speciosum* | 33 | 3.6 | 0.1 | 0.2 | 0.2 | | | | |
| **Non-vasc** | | | | | | | | | | |
| | Lichen | 50 | 49.8 | 3.8 | 2.0 | 15.0 | | | | **x** |

Con = Constancy, RelCov = Average Relative Cover, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Char = Characteristic, D = Dominant, cD = Co-dominant, Of = Often

## *Ericameria cuneata* ssp. *spathulata* Provisional Association

**Common Name:** Wide-leaved Rock Goldenbush Association

**Classification Comments:** none

**Plot/Sample Data Summary:**

Elevation: Mean 1459 m, Range 1318 – 1563 m
Slope: Mean 47°, Range 42 – 52°
Aspect: Mostly northwest-facing

Tree Cover: 0%
Shrub Cover: Mean 7.7%, Range 2 – 11%
Herb Cover: Mean 0.6%, Range 0 – 1%

**Surface Covers:**

Large Rock: Mean 62.7%, Range 0.0 –98%
Small Rock: Mean 4.7%, Range 1 – 9%
Fines: Mean 0.1%, Range 0 – 0.2%
Litter: Mean 0.1%, Range 0 – 0.2%

**Surveys Used in Description (N = 3):** DEVA9138, OWVA0023, SLTN0538

**Association Stand Table:**

| Layer | Taxon | Con | RelCov | Avg | Min | Max | Char | D | cD | Of |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shrub** | | | | | | | | | | |
| | *Ericameria cuneata* | 100 | 31.9 | 2.3 | 1.0 | 4.0 | X | | X | X |
| | *Symphoricarpos longiflorus* | 67 | 25.4 | 2.7 | 2.0 | 6.0 | | | | X |
| | *Fraxinus anomala* | 67 | 7.2 | 0.7 | 0.2 | 2.0 | | | | X |
| | *Ericameria teretifolia* | 67 | 5.8 | 0.4 | 0.2 | 1.0 | | | | X |
| | *Brickellia longifolia* | 67 | 3.2 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Gutierrezia microcephala* | 67 | 2.9 | 0.1 | 0.1 | 0.2 | | | | X |
| | *Eriogonum fasciculatum* | 67 | 2.9 | 0.1 | 0.1 | 0.2 | | | | X |
| | *Artemisia bigelovii* | 33 | 6.5 | 0.7 | 2.0 | 2.0 | | | | |
| | *Prunus fasciculata* | 33 | 3.3 | 0.3 | 1.0 | 1.0 | | | | |
| | *Ephedra viridis* | 33 | 2.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Grayia spinosa* | 33 | 2.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Gutierrezia sarothrae* | 33 | 0.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Brickellia microphylla* | 33 | 2.6 | 0.1 | 0.2 | 0.2 | | | | |
| | *Artemisia tridentata* | 33 | 2.6 | 0.1 | 0.2 | 0.2 | | | | |
| **Herb** | | | | | | | | | | |
| | *Elymus elymoides* | 67 | 14.1 | 0.1 | 0.2 | 0.2 | | | | X |
| | *Achnatherum parishii* | 67 | 14.1 | 0.1 | 0.2 | 0.2 | | | | X |
| | Forb (herbaceous, not grass nor grasslike) | 33 | 12.5 | 0.1 | 0.3 | 0.3 | | | | |
| | *Arabis* | 33 | 11.1 | 0.1 | 0.2 | 0.2 | | | | |
| | *Nicotiana obtusifolia* | 33 | 3.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Stephanomeria exigua* | 33 | 3.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Bromus rubens* | 33 | 3.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Poa secunda* | 33 | 3.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Galium multiflorum* | 33 | 3.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Achnatherum speciosum* | 33 | 3.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Cirsium arizonicum* | 33 | 3.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Erigeron breweri* | 33 | 3.0 | 0.1 | 0.2 | 0.2 | | | | |
| | *Arabis perennans* | 33 | 3.0 | 0.1 | 0.2 | 0.2 | | | | |
| | Graminoid (grass or grasslike*)* | 33 | 8.3 | 0.1 | 0.2 | 0.2 | | | | |
| **Non vasc** | | | | | | | | | | |
| | Lichen | 67 | 66.2 | 5.7 | 2.0 | 15.0 | | | | X |
| | Moss | 33 | 0.4 | 0.1 | 0.2 | 0.2 | | | | |

## APPENDIX I - GLOSSARY

The following terms with their respective definitions have been established in developing the floristic vegetation classification, keys, and descriptions.

- **Constancy, Cover-Abundance, and Related Terms** – Used in the key, descriptions and the vegetation constancy tables (codes from tables in parentheses):
  - **Constancy** (Con) – Number of occurrences divided by the number of samples X 100%
  - **Diagnostic** – A species or group of species whose relative constancy or abundance differentiates one vegetation type from another; the term can include character, constant, differential, and indicator species (Jennings et al. 2006).
  - **Dominant** (D) – Must be in at least 75% of the samples, with at least 50% relative cover in all samples.
  - **Co-dominant** (cD) – Must be in at least 75% of the samples, with at least 30% relative cover in all samples.
  - **Characteristic** (Char) – Present in at least 75% of the samples for that vegetation type, with no restriction on cover.
  - **Abundant** – Present in 50 to 75% of the samples, with at least 50% relative cover.
  - **Usually/Often** (Often) – Present in 50 to 75% of the samples, with no restriction on cover.
  - **Sometimes** – Present in 25 to 50% of the samples, with no restriction on cover.
  - **Average** (Avg) **and Relative Cover** (RelCov) – Average cover for a taxon in a vegetation type is calculated as the sum of its 'absolute' cover values divided by the total sample size; relative cover is calculated as the comparative sum of cover values for one taxon compared to the sum of cover values of other taxa, in which proportional numbers are derived (see **Cover** section for more details).
  - **Minimum** (Min) and **Maximum** (Max) – The minimum and maximum cover values that a taxon had from the surveys of a vegetation type. Values could be an absolute cover value (e.g., 1%) and/or a mid-point value of a cover class (e.g., 2.5% for a cover class of 1–5 %) depending on data available
- **Cover** – The primary metric used to quantify the abundance of a particular species or a particular vegetation layer within a plot. It was measured by estimating the aerial extent of the living plants, or the "bird's-eye view" looking from above for each category. Various subcategories of cover for species and vegetation are defined as follows:
  - **Absolute cover** – Refers to the actual percentage of the ground (surface of the plot or stand) that is covered by a species or group of species. For example, *Pinus monophylla* covers between 5% and 10% of the stand. Absolute cover of all species or groups if added in a stand or plot may total greater or less than 100% because it is not a proportional number.
  - **Relative cover** – Refers to the amount of the surface of the plot or stand sampled that is covered by one species (or physiognomic group) as compared to (relative to) the amount of surface of the plot or stand covered by all species (in that group). Thus, 50% relative cover means that half of the total cover of all species or physiognomic groups is composed of the single species or group in question. Relative cover values are proportional numbers and, if added, total 100% for each stand (sample).
  - **Dense/Continuous cover** – Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where there is greater than 66 percent absolute cover.

- **Intermittent cover** – Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where there is 33-66 percent absolute cover.
- **Open cover** – Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where the cover is less than 33 percent absolute cover.
- **Sparse cover** – Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where the *average* cover value is <2% absolute cover (though the range in cover could be <1-9% cover).
- **Emergent** – A plant (or vegetation layer) is considered emergent if it includes plants that rises above a predominant vegetation layer, but that are sparse in cover. It is considered as a member of the next tallest layer, but typically has an absolute cover < 10%.

- **Lifeform terms:**
  - **Tree** – Is a one-stemmed woody plant that normally grows to be greater than 5 meters tall. In some cases trees may be multiple-stemmed (ramifying) after fire or other disturbance, but size of mature plants is typically greater than 5 m and undisturbed individuals of these species are usually single stemmed.
  - **Shrub** – Is normally a multi-stemmed woody plant that generally has several erect, spreading, or prostrate stems and that is usually between 0.2 meters and 5 meters tall, giving it a bushy appearance. Definitions are blurred at the low and the high ends of the height scales. At the tall end, shrubs may approach trees based on disturbance frequencies (e.g., old-growth re-sprouting chaparral species such as *Quercus turbinella,* etc., may frequently attain "tree size"). At the low end, woody perennial herbs or sub-shrubs of various species are often difficult to categorize into a single life-form; usually sub-shrubs (per USDA-NRCS 2011) were categorized in the "shrub" category.
  - **Herb** – Is any vascular plant species that has no main woody stem-development, and includes grasses, forbs, and perennial species that die-back seasonally.
  - **Cryptogam -** Is a nonvascular plant or plant-like organism without specialized water or fluid conducting vascular tissue (i.e., xylem and phloem). Includes mosses, lichens, liverworts, hornworts, and algae.
- **Stand** – Is the basic physical unit of vegetation in a landscape. It has no set size. Some vegetation stands are very small such as wetland seeps, and some may be several square kilometers in size such as desert or forest types. A stand is defined by two main unifying characteristics:
    - It has *compositional* integrity. Throughout the site, the combination of species is similar. The stand is differentiated from adjacent stands by a discernable boundary that may be abrupt or gradual.
    - It has *structural* integrity. It has a similar history or environmental setting, affording relatively similar horizontal and vertical spacing of plant species. For example, a hillside forest formerly dominated by the same species, but that has burned on the upper part of the slope and not the lower is divided into two stands. Likewise, a sparse woodland occupying a slope with shallow rocky soils is considered a different stand from an adjacent slope of a denser woodland/forest with deep moister soil and the same species.
- **Vegetation:**
  - **Woodland and forest vegetation**: In the National Vegetation Classification, a woodland is defined as a tree-dominated stand of vegetation with between 25 and 60 percent cover of trees and a forest is defined as a tree-dominated stand of vegetation with 60 percent or greater cover of trees.
  - **Shrubland vegetation**: Shrubs (including dwarf-shrubs) are evenly distributed throughout the stand, providing a consistent (even if sparse) structural component, 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 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.
    - **Semi-natural/ruderal vegetation**: Stands characterized by naturalized non-native species. Examples include *Tamarix* spp., and *Brassica* spp. Note: the terminology for semi-natural versus ruderal plant communities is still under discussion with ESA Vegetation Panel and Hierarchy Review Working Group, and in the last 5 years the classification names have gone back and forth between these two terms.
- **National Vegetation Classification Hierarchy Levels:**
    - **Class** – A vegetation classification unit of high rank (1st level) defined by a broad combination of dominant general growth forms adapted to basic moisture, temperature, and/or substrate or aquatic conditions (FGDC 2008).
    - **Subclass –** A vegetation classification unit of high rank (2nd level) defined by a combination of general dominant and diagnostic growth forms that reflect global mega- or macroclimatic factors driven primarily by latitude and continental position, or that reflect overriding substrate or aquatic conditions (FGDC 2008).
    - **Formation –** A vegetation classification unit of high rank (3rd level) defined by a Combination of dominant and diagnostic growth forms that reflect global macroclimatic conditions as modified by altitude, seasonality of precipitation, substrates, and hydrologic conditions (FGDC 2008).
    - **Division –** A vegetation classification unit of intermediate rank ($4^{th}$ level) defined by a combination of dominant and diagnostic growth forms and a broad set of diagnostic plant species that reflect biogeographic differences in composition and continental differences in mesoclimate, geology, substrates, hydrology, and disturbance regimes (FGDC 2008).
    - **Macrogroup** – A vegetation classification unit of intermediate rank ($5^{th}$ level) defined by a moderate set 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 (FGDC 2008).
    - **Group** – A vegetation classification unit of intermediate rank ($6^{th}$ 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 (FGDC 2008).
    - **Alliance** – A classification unit of vegetation of low rank ($7^{th}$ level), containing one or more associations and defined by one or more diagnostic species, often of high cover, in the uppermost layer or the layer with the highest canopy cover. Alliances reflect physiognomy as well as regional to subregional climates, substrates, hydrology, and disturbance regimes (Jennings et al. 2006, FGDC 2008).
    - **Association** – A vegetation classification unit of low rank ($8^{th}$ level) defined by a diagnostic species, a characteristic range of species composition, physiognomy, and distinctive habitat conditions (Jennings et al. 2006). Associations reflect local topo-edaphic climates, substrates, hydrology, and disturbance regimes.
- **Other Classification Terms:**
    - **Provisional Type –** A vegetation type that is not yet formally described, but expected to be an addition to the existing list of USNVC types for a project area. The type may be represented by plot samples (e.g, <10 samples), while it may or may not be particularly common or because it is

localized in extent; however, it could be documented in additional location(s) outside of the study area.

- **Conservation Rank** – Listed by the state Nature Conservancy Heritage Programs, including the California Department of Fish and Wildlife's Vegetation Classification and Mapping Program, these are the "Global" and "State" ranks, as seen below:
  - **G1 and S1** – Critically Imperiled—At very high risk of extinction due to extreme rarity. Often 5 or fewer viable occurrences and/or up to 518 hectares.
  - **G2 and S2** – Imperiled—At high risk of extinction due to very restricted range, very few occurrences, steep declines, or other factors. Often 6–20 viable occurrences, and/or 518–2,590 hectares
  - **G3 and S3** – Vulnerable—At moderate risk of extinction due to a restricted range, relatively few populations, recent and widespread declines, or other factors. Often 21–100 viable occurrences and/or 2,590–12,950 hectares.
  - **G4 and S4** – Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors. Often greater than 100 viable occurrences and/or more than 12,950 hectares.
  - **G5 and S5** – Secure—Common; widespread and abundant.
- **Landform and Other Descriptive Terms:**
  - **Bajada** – An alluvial plain formed at the base of a mountain by the coalescing of several alluvial fans.
- **Abbreviations and Other Characters:**
  - **Parentheses ( )** – When parentheses are used around a species name within a vegetation type name, it indicates that the species is often present as an indicator of that association or alliance, but it does not meet a threshold of 75% or more constancy. The parentheses may be used around the full scientific name or only around the species epithet. An example is the *Pinus longaeva / (Ericameria discoidea - Ribes* spp.) association. If parentheses are only around the species epithet, it means that the genus is consistently present but another species could also be present from that genus. An example is the *Sphaeralcea (ambigua, coccinea, parvifolia)* Dry Meadow Alliance, where the genus may be represented by one or more species found within the parentheses.

# APPENDIX J - CONTINGENCY TABLES

Contingency Table for the Salton Sea and Flat-Tailed Horned Lizard Subareas

| | Field Assessed Type (Users) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PI Type (Producers)** | Acacia greggii | Allenrolfea occidentalis | Ambrosia dumosa | Ambrosia salsola | Atriplex canescens | Atriplex hymenelytra | Atriplex lentiformis | Chilopsis linearis | Chorizanthe rigida-Geraea canescens desert pavement | Dicoria canescens - Abronia villosa | Encelia farinosa | Isocoma acradenia | Larrea tridentata | Larrea tridentata - Ambrosia dumosa | Larrea tridentata - Encelia farinosa | Lower Bajada & Fan Moj.–Sonoran desert scrub Gp | Medit. CA naturalized annual & perennial grassland Gp | mud hills sparsely vegetated ephemeral herbs | North American warm desert bedrock cliff & outcrop Gp | North American warm desert dunes and sand flats Gp | Parkinsonia florida-Olneya tesota | Phragmites australis | Pleuraphis rigida | Pluchea sericea | Prosopis glandulosa | Psorothamnus spinosus | sparsely vegetated playa (ephemeral annuals) | Suaeda moquinii | Tamarix spp. | Typha (angustifolia, domingensis, latifolia) | Unvegetated wash & river bottom MU | Total |
| Acacia greggii Sub-Alliance | 2 | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | 3 |
| Allenrolfea occidentalis | | 6 | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | 7 |
| Ambrosia dumosa Alliance | | | 1 | 1 | 1 | | | 1 | | | | | 1 | | 1 | | | | | | | | | | | | | | | | 6 |
| Ambrosia salsola = Ambrosia salsola - Bebbia juncea Alliance | | | | 2 | 1 | | | | | 1 | | | | | | | | | | | | | 1 | | | | | | | | 5 |
| Atriplex canescens Alliance | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Atriplex hymenelytra Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Atriplex lentiformis Alliance | | | | | | | 3 | | | | | | | | | | | | | | | | 2 | | | | | | | | 5 |
| Chilopsis linearis Sub-Alliance | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Chorizanthe rigida-Geraea canescens desert pavement Alliance | | | | | | | | 6 | | | | | | | | | | | 1 | | | | | | | | | | | | 7 |
| Dicoria canescens - Abronia villosa Alliance | | | | | | | | 1 | 4 | | | | | | | | | 2 | | | | | | | | | | | | | 5 |
| Encelia farinosa Alliance | | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | 2 |
| Isocoma acradenia Association | | | | | | | | | | | 5 | | | | | | | | | | | | 1 | | | | 2 | | | | 8 |
| Larrea tridentata Alliance | | | | | | | | | | | | 2 | 1 | 1 | | | | | | | | | | | | | | | | | 4 |
| Larrea tridentata - Ambrosia dumosa Alliance | | | | | | | | 1 | | | | 1 | 4 | | | | | | | | | | | | | | | | | | 6 |
| Larrea tridentata - Encelia farinosa Alliance | | | | | | | | 1 | | | | | | 4 | | | | | | | | | 1 | | | | | | | | 6 |
| Lower Bajada & Fan Moj.–Sonoran desert scrub Gp | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Medit. CA naturalized annual & perennial grassland Gp | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Mud hills sparsely vegetated ephemeral herbs Mapping Unit | | | | | | | | 1 | | | | | | | | | 5 | | | | | | | | | | | | | | 6 |
| North American warm desert bedrock cliff and outcrop Gp | | | | | | | | 2 | | | | | | | | | | 2 | | | | | | | | | | | | | 4 |
| North American warm desert dunes and sand flats Gp | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Parkinsonia florida-Olneya tesota Alliance | 2 | | | | | | | | | | | | | | | | | | 5 | | | | | | | | 1 | | | | 8 |
| Phragmites australis Association | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Pleuraphis rigida Alliance | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | 3 |
| Pluchea sericea Alliance | | | | | | | | | | | | | | | | | | | | | | 3 | | | | | 1 | | | | 4 |
| Prosopis glandulosa = *P. glandulosa - P. velutina – P. pubescens* Alliance | | | | | | | | | | | | | | | | | | | | | | | 4 | | | | | | | | 4 |
| Psorothamnus spinosus Sub-alliance | | | | | | | | | | | | | | | | | | | | | | | | 9 | | | | | | | 9 |
| Sparsely vegetated playa (ephemeral annuals) Mapping Unit | | | | | | | | 2 | | | | | | | | | | | | | | | | | 4 | | | | | | 6 |
| Suaeda moquinii Alliance | | | | | 1 | | | | | | | | | | | | | | | | | | | | | 2 | | | | | 3 |
| Tamarix spp. Alliance | | 1 | | | | | | | | | | | | | | | | | | | 1 | | | | | | 4 | | 1 | | 7 |
| Typha (angustifolia, domingensis, latifolia) Alliance | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | 1 | | | 2 |
| Unvegetated wash & river bottom Mapping Unit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Grand Total | 4 | 7 | 1 | 3 | 3 | 1 | 3 | 1 | 15 | 4 | 1 | 5 | 3 | 6 | 5 | 1 | 1 | 7 | 2 | 1 | 5 | 1 | 5 | 6 | 4 | 10 | 4 | 5 | 6 | 1 | 1 | **122** |

Contingency Table for the Picacho Subarea

| | Field Assessed Type (Users) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PI Type (Producers)** | Acacia greggii | Allenrolfea occidentalis | Ambrosia dumosa | Ambrosia salsola | Atriplex canescens | Atriplex hymenelytra | Atriplex lentiformis | Chilopsis linearis | Chorizanthe rigida-Geraea canescens desert pavement | Dicoria canescens - Abronia villosa | Encelia farinosa | Isocoma acradenia | Larrea tridentata | Larrea tridentata - Ambrosia dumosa | Larrea tridentata - Encelia farinosa | Lower Bajada & Fan Moj.–Sonoran desert scrub Gp | Medit. CA naturalized annual & perennial grassland Gp | mud hills sparsely vegetated ephemeral herbs | North American warm desert bedrock cliff & outcrop Gp | North American warm desert dunes and sand flats Gp | Parkinsonia florida-Olneya tesota | Phragmites australis | Pleuraphis rigida Alliance | Pluchea sericea | Prosopis glandulosa | Psorothamnus spinosus | sparsely vegetated playa (ephemeral annuals) | Suaeda moquinii | Tamarix spp. | Typha (angustifolia, domingensis, latifolia) | Unvegetated wash & river bottom MU | Total |
| Acacia greggii Sub-Alliance | 2 | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | 3 |
| Allenrolfea occidentalis | | 6 | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | 7 |
| Ambrosia dumosa Alliance | | | 1 | 1 | 1 | | | 1 | | | | | 1 | | 1 | | | | | | | | | | | | | | | | 6 |
| Ambrosia salsola = Ambrosia salsola - Bebbia juncea Alliance | | | | 2 | 1 | | | | | 1 | | | | | | | | | | | | 1 | | | | | | | | | 5 |
| Atriplex canescens Alliance | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Atriplex hymenelytra Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Atriplex lentiformis Alliance | | | | | | | 3 | | | | | | | | | | | | | | | | 2 | | | | | | | | 5 |
| Chilopsis linearis Sub-Alliance | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Chorizanthe rigida-Geraea canescens desert pavement Alliance | | | | | | | | | 6 | | | | | | | | | | 1 | | | | | | | | | | | | 7 |
| Dicoria canescens - Abronia villosa Alliance | | | | | | | | | 1 | 4 | | | | | | | | | | | | | | | | | | | | | 5 |
| Encelia farinosa Alliance | | | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | 2 |
| Isocoma acradenia Association | | | | | | | | | | | | 5 | | | | | | | | | | | 1 | | | 2 | | | | | 8 |
| Larrea tridentata Alliance | | | | | | | | | | | | | 2 | 1 | 1 | | | | | | | | | | | | | | | | 4 |
| Larrea tridentata - Ambrosia dumosa Alliance | | | | | | | | | 1 | | | | 1 | 4 | | | | | | | | | | | | | | | | | 6 |
| Larrea tridentata - Encelia farinosa Alliance | | | | | | | | | 1 | | | | | | 4 | | | | | | | 1 | | | | | | | | | 6 |
| Lower Bajada & Fan Moj.–Sonoran desert scrub Gp | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Medit. CA naturalized annual & perennial grassland Gp | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Mud hills sparsely vegetated ephemeral herbs Mapping Unit | | | | | | | | | 1 | | | | | | | | | 5 | | | | | | | | | | | | | 6 |
| North American warm desert bedrock cliff and outcrop Gp | | | | | | | | | 2 | | | | | | | | | | 2 | | | | | | | | | | | | 4 |
| North American warm desert dunes and sand flats Gp | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Parkinsonia florida-Olneya tesota Alliance | 2 | | | | | | | | | | | | | | | | | | | 5 | | | | | | | 1 | | | | 8 |
| Phragmites australis Association | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Pleuraphis rigida Alliance | | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | 3 |
| Pluchea sericea Alliance | | | | | | | | | | | | | | | | | | | | | | | 3 | | | | 1 | | | | 4 |
| Prosopis glandulosa = *P. glandulosa - P. velutina – P. pubescens* Alliance | | | | | | | | | | | | | | | | | | | | | | | | 4 | | | | | | | 4 |
| Psorothamnus spinosus Sub-alliance | | | | | | | | | | | | | | | | | | | | | | | | | 9 | | | | | | 9 |
| Sparsely vegetated playa (ephemeral annuals) Mapping Unit | | | | | | | | | 2 | | | | | | | | | | | | | | | | | 4 | | | | | 6 |
| Suaeda moquinii Alliance | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | 2 | | | | 3 |
| Tamarix spp. Alliance | | 1 | | | | | | | | | | | | | | | | | | | 1 | | | | | | | 4 | | 1 | 7 |
| Typha (angustifolia, domingensis, latifolia) Alliance | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | 1 | | 2 |
| Unvegetated wash & river bottom Mapping Unit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Grand Total | 4 | 7 | 1 | 3 | 3 | 1 | 3 | 1 | 15 | 4 | 1 | 5 | 3 | 6 | 5 | 1 | 1 | 7 | 2 | 1 | 5 | 1 | 5 | 6 | 4 | 10 | 4 | 5 | 6 | 1 | 1 | **122** |



Appendix J

Contingency Table for the Owens Valley Subarea

| PI Type (Producers) | Ambrosia dumosa Alliance | Ambrosia salsola – Bebbia juncea Alliance | Anemopsis californica – Helianthus nuttallii – Solidago spectabilis Alliance | Arid West freshwater emergent marsh Group | Artemisia tridentata Alliance | Atriplex canescens Alliance | Atriplex confertifolia Alliance | Atriplex hymenelytra Alliance | Atriplex lentiformis Alliance | Atriplex polycarpa Alliance | Baccharis emoryi – Baccharis sergiloides Alliance | Betula occidentalis Alliance | Bolboschoenus maritimus, Schoenoplectus americanus MU | Chorizanthe rigida – Geraea canescens Desert Pavement Alliance | Coleogyne ramosissima Alliance | Cornus sericea – Rosa woodsii – Ribes spp. Alliance | Dicoria canescens – Abronia villosa Alliance | Distichlis spicata Alliance | Ephedra nevadensis - Lycium andersonii - Grayia spinosa Alliance | Ericameria nauseosa – Atriplex lentiformis Mapping Unit | Ericameria nauseosa Alliance | Eriogonum fasciculatum – (Viguiera parishii) Alliance | Eriogonum fasciculatum Alliance | Eucalyptus spp. –Ailanthus altissima–Robinia pseudoacacia Alliance | Forestiera pubescens Alliance | Juncus arcticus (var. balticus, mexicanus) Alliance | Larrea tridentata – Ambrosia dumosa Alliance | Larrea tridentata Alliance | Massive sparsely vegetated rock outcrop Mapping Unit | North American warm desert dunes and sand flats Group | Populus fremontii – Fraxinus velutina – Salix gooddingii Alliance | Prunus fasciculata – Salazaria mexicana Alliance | Psorothamnus fremontii – Psorothamnus polydenius Alliance | Salix exigua Alliance | Salix gooddingii – Salix laevigata Alliance | Salix lasiolepis Alliance | Sarcobatus vermiculatus Alliance | Schoenoplectus (acutus, californicus) Alliance | Sporobolus airoides–Muhlenbergia asperifolia–Spartina gracilis All. | Suaeda moquinii – Isocoma acradenia Alliance | Tamarix spp. Semi-natural Stands | Typha (angustifolia, domingensis, latifolia) Alliance | Vancouverian & Rocky Mountain naturalized grassland Group | Yucca brevifolia Alliance | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ambrosia dumosa Alliance** | 1 | | | | | | 1 | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 |
| **Ambrosia salsola – Bebbia juncea Alliance** | | 2 | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | 1 | | | | | | | | | | | | | 4 |
| **Anemopsis californica – Helianthus nuttallii – Solidago spectabilis Alliance** | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| **Arid West freshwater emergent marsh Group** | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| **Artemisia tridentata Alliance** | | | | | 2 | 1 | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | 4 |
| **Atriplex canescens Alliance** | | | | | 1 | 2 | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | 5 |
| **Atriplex confertifolia Alliance** | 1 | | | | | | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 |
| **Atriplex hymenelytra Alliance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| **Atriplex lentiformis Alliance** | | | 1 | | | | | 1 | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| **Atriplex polycarpa Alliance** | | | | | 2 | | 1 | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 7 |
| **Baccharis emoryi – Baccharis sergiloides Alliance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| **Betula occidentalis Alliance** | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| **Bolboschoenus maritimus, Schoenoplectus americanus Mapping Unit** | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| **Chorizanthe rigida – Geraea canescens Desert Pavement Alliance** | | | | | | | 2 | | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 6 |
| **Coleogyne ramosissima Alliance** | | | | | | | | | 1 | | | | 1 | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| **Cornus sericea – Rosa woodsii – Ribes spp. Alliance** | | | | | | | | | | | | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 |
| **Dicoria canescens – Abronia villosa Alliance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| **Distichlis spicata Alliance** | | | 1 | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 |
| **Ephedra nevadensis - Lycium andersonii - Grayia spinosa Alliance** | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 |
| **Ericameria nauseosa – Atriplex lentiformis Mapping Unit** | | | | | | | | 1 | | | | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| **Ericameria nauseosa Alliance** | | 1 | | | | 1 | | | | | | | | | | | | 3 | 1 | | | | | | | | | | 1 | | | | | | | | | | | | | | 7 |
| **Eriogonum fasciculatum – (Viguiera parishii) Alliance** | | | | | | 1 | | | | | | | 1 | | | | | | 2 | | | | | | 1 | | | | | | | | | | | | | | | | | | 5 |
| **Eriogonum fasciculatum Alliance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| **Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia Alliance** | | | | | | | | | | | | | | | | | | | | | 5 | | | | | | | | | | | | | | | | | | | | | | 5 |
| **Forestiera pubescens Alliance** | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | | | | | 4 |
| **Juncus arcticus (var. balticus, mexicanus) Alliance** | | | | | | | | | | | | | | | | | 2 | | | | | | 1 | | | | | | | | | | | | | | | | | | 1 | 1 | | 5 |
| **Larrea tridentata – Ambrosia dumosa Alliance** | | | | | | | | | | | | | | | | | | | | | | | | 3 | 1 | | | | | | | | | | | | | | | | | | | 1 | 5 |
| **Larrea tridentata Alliance** | | | | | | | | | | | | | | | | | | | | | | | | 1 | 4 | | | | | | | | | | | | | | | | | | | | 5 |
| **Massive sparsely vegetated rock outcrop Mapping Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| **North American warm desert dunes and sand flats Group** | | | | | | | | | | | | | | | 4 | | | | | | | | | | | | | | 1 | | | | | | 1 | | | | | | | | | 6 |
| **Populus fremontii – Fraxinus velutina – Salix gooddingii Alliance** | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | 2 | | | | | 1 | | | | | | | | | 5 |
| **Prunus fasciculata – Salazaria mexicana Alliance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| **Psorothamnus fremontii – Psorothamnus polydenius Alliance** | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | 4 | | | | | | | | | | | | 5 |
| **Salix exigua Alliance** | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | 4 |
| **Salix gooddingii – Salix laevigata Alliance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | 2 |
| **Salix lasiolepis Alliance** | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | 3 | | | | | | | | | | 4 |
| **Sarcobatus vermiculatus Alliance** | | | | | | | | | | 1 | | | | | 1 | | | | | | | | | | | | | | | | | | | | 3 | | | 1 | | | | | 6 |
| **Schoenoplectus (acutus, californicus) Alliance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | 3 |
| **Sporobolus airoides – Muhlenbergia asperifolia – Spartina gracilis Alliance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | 2 |
| **Suaeda moquinii Alliance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | 4 | | | | | | 5 |
| **Tamarix spp. Semi-natural Stands** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | 5 |
| **Typha (angustifolia, domingensis, latifolia) Alliance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | 2 |
| **Vancouverian & Rocky Mountain naturalized grassland Group** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 | | | 4 |
| **Yucca brevifolia Alliance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| **Grand Total** | 2 | 3 | 3 | 1 | 5 | 6 | 4 | 4 | 2 | 7 | 1 | 3 | 0 | 0 | 2 | 4 | 8 | 7 | 3 | 2 | 3 | 6 | 1 | 5 | 3 | 1 | 4 | 5 | 1 | 1 | 2 | 1 | 6 | 6 | 3 | 5 | 7 | 5 | 3 | 6 | 4 | 2 | 4 | 1 | **152** |

Field Assessed Type (Users)

Contingency Table for the Jawbone South Subarea

| PI Type (Producers) \ Field Assessed Type (Users) | Quercus douglasii Alliance | Quercus lobata Alliance | Quercus chrysolepis Alliance | Quercus wislizeni Alliance | Quercus kelloggii Forest Alliance | Pinus sabiniana Alliance | Juniperus californica Alliance | Pinus jeffreyi Alliance | Pinus monophylla Alliance | Populus fremontii – Fraxinus velutina – Salix gooddingii Alliance | Salix gooddingii – Salix laevigata Alliance | Baccharis salicifolia Alliance | Baccharis emoryi – Baccharis sergiloides Alliance | Forestiera pubescens Alliance | Salix lasiolepis Alliance | Arctostaphylos glauca Alliance | Ceanothus cuneatus Alliance | Arctostaphylos viscida Alliance | Ceanothus oliganthus – Ceanothus leucodermis Alliance | Corethrogyne filaginifolia–Eriogonum (elongatum, nudum) Alliance | Eriogonum fasciculatum – (Viguiera parishii) Alliance | Eriogonum wrightii–Eriogonum heermannii–Buddleja utahensis Alliance | Eriogonum fasciculatum Alliance | California annual & perennial grassland (Native component) MU | Medit. California naturalized annual & perennial grassland Gp | Brassica tournefortii – Malcomia rabicus nigra Semi-natural Alliance | Quercus john-tuckeri Alliance | Ceanothus greggii – Fremontodendron californicum Alliance | Ambrosia dumosa Alliance | Atriplex polycarpa Alliance | Larrea tridentata – Ambrosia dumosa Alliance | Larrea tridentata Alliance | Lepidospartum squamatum Alliance | Encelia (actoni, virginensis) – Viguiera reticulata Alliance | Ericameria nauseosa Alliance | Artemisia tridentata Alliance | Ephedra nevadensis–Lycium andersonii–Grayia spinosa Alliance | Coleogyne ramosissima Alliance | Yucca brevifolia Alliance | Cercocarpus ledifolius Alliance | North American warm desert bedrock cliff and outcrop Group | Massive sparsely vegetated rock outcrop Mapping Unit | Ambrosia salsola – Bebbia juncea Alliance | Prunus fasciculata – Salazaria mexicana Alliance | Anthropogenic Areas of Little or No Vegetation | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quercus douglasii Alliance | 6 | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 7 |
| Quercus lobata Alliance | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Quercus chrysolepis Alliance | | | 3 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 |
| Quercus wislizeni Alliance | 1 | | | 3 | | | | 1 | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | 7 |
| Quercus kelloggii Forest Alliance | | | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 |
| Pinus sabiniana Alliance | | | | | | 2 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| Juniperus californica Alliance | | | | | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 |
| Pinus jeffreyi Alliance | | | 2 | | | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 6 |
| Pinus monophylla Alliance | | | | | | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 |
| Populus fremontii – Fraxinus velutina – Salix gooddingii Alliance | | | | | | | | | | 4 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 |
| Salix gooddingii – Salix laevigata Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Baccharis salicifolia Alliance | | | | | | | | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 |
| Baccharis emoryi – Baccharis sergiloides Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | 2 |
| Forestiera pubescens Alliance | | | | | | | | | | | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 |
| Salix lasiolepis Alliance | | | | | | | | | | 2 | 1 | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 |
| Arctostaphylos glauca Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Ceanothus cuneatus Alliance | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | 1 | | | | | | | | | | | | | 1 | | | 1 | | 5 |
| Arctostaphylos viscida Alliance | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Ceanothus oliganthus – Ceanothus leucodermis Alliance | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Corethrogyne filaginifolia – Eriogonum (elongatum, nudum) Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Eriogonum fasciculatum – (Viguiera parishii) Alliance | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | 1 | | | | | | | | 3 |
| Eriogonum wrightii–Eriogonum heermannii–Buddleja utahensis Alliance | | | | | | | | | | | | | | | | | | | 1 | | | 4 | 1 | | | | | | | | | | | | | | | | | | | | | | 6 |
| Eriogonum fasciculatum Alliance | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | 1 |
| California annual and perennial grassland (Native component) MU | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | 1 | 3 |
| Mediterranean California naturalized annual & perennial grassland Gp | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Brassica tournefortii – Malcomia rabicus nigra Semi-natural Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Quercus john-tuckeri Alliance | 1 | | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| Ceanothus greggii – Fremontodendron californicum Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | 2 |
| Ambrosia dumosa Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | 1 | | 1 | | 3 |
| Atriplex polycarpa Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | 1 | 1 | | | | | | | | 2 | | | | 6 |
| Larrea tridentata – Ambrosia dumosa Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | 7 | | | | | | | | | | | | | | 8 |
| Larrea tridentata Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Lepidospartum squamatum Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | 7 | | | | | | | | | | | | | | 8 |
| Encelia (actoni, virginensis) – Viguiera reticulata Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Ericameria nauseosa Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | 5 | 1 | | | | | | | | | 7 |
| Artemisia tridentata Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 3 | | | | | | | | | 5 |
| Ephedra nevadensis–Lycium andersonii–Grayia spinosa Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | 2 | | | | | | | | 5 |
| Coleogyne ramosissima Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | 2 | | | | | | | | 3 |
| Yucca brevifolia Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | | | | | | | 2 |
| Cercocarpus ledifolius Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| North American warm desert bedrock cliff and outcrop Group | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | 2 |
| Massive sparsely vegetated rock outcrop Mapping Unit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Ambrosia salsola – Bebbia juncea Alliance | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 | 1 | | | | | | | | | 3 | | | | | 7 |
| Prunus fasciculata – Salazaria mexicana Alliance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | 3 | | 4 |
| Anthropogenic Areas of Little or No Vegetation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| Grand Total | 8 | 1 | 5 | 4 | 4 | 2 | 6 | 4 | 8 | 4 | 2 | 7 | 0 | 5 | 1 | 1 | 3 | 0 | 0 | 1 | 2 | 4 | 3 | 0 | 1 | 1 | 0 | 5 | 4 | 4 | 8 | 1 | 9 | 2 | 7 | 4 | 0 | 6 | 1 | 1 | 0 | 3 | 5 | 9 | 1 | **147** |