MECCA HILLS AND OROCOPIA MOUNTAINS MAP REATTRIBUTION METHODS REPORT

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Orocopia Mountains within the Mecca Hills and Orocopia Mountains Wilderness (Chuckwalla National Monument) – Melanie Davis 2025, UCR CCB

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ABSTRACT

This report describes an effort to bring the 2012-2015 vegetation map for Mecca Hills and Orocopia Mountains in Riverside County, California into compliance with the Survey of California Vegetation (SCV) standards. In 2015, the Center for Conservation Biology at University of California, Riverside (UCR CCB) created a fine-scale vegetation map of the Mecca Hills and Orocopia Mountains Conservation Area within the Coachella Valley Multiple Species Habitat Conservation Plan area (the Plan) under contract with the Coachella Valley Conservation Commission (Sweet et al., 2015). The original vegetation map was based on field survey data and aimed to support conservation of covered species under the Plan, such as Orocopia sage (*Salvia greatae*; CRPR 1B.3), Mecca aster (*Xylorhiza cognata;* rank 1B.2) and the federally threatened Mojave desert tortoise (*Gopherus agassizii*). For the present effort, California Department of Fish and Wildlife (CDFW) contracted UCR CCB to update the mapping attributes to comply with current SCV standard used state-wide and for adjacent vegetation maps within the Colorado and Mojave Deserts of California. Vegetation cover classes, impact and disturbance values, and additional modifiers were assigned and re-evaluated to more consistently characterize the composition of vegetation communities and other attributes and improve cross-compatibility with other maps. Photo interpreters assigned attributes based on the original 2012 National Agricultural Imagery Program (NAIP) aerial imagery, and map classes were corrected and updated to the current classification nomenclature. No field sampling was performed to support the reattribution of the existing map, although site information such as 2012-2015 field data was used to validate map classes and attributes. This report describes the reattribution process and includes an appendix with a crosswalk detailing the changes implemented for each attribute and mapping unit.

Keywords: vegetation, vegetation type mapping, desert, photointerpretation, Colorado Desert, Orocopia Mountains, Mecca Hills, reattribution

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INTRODUCTION

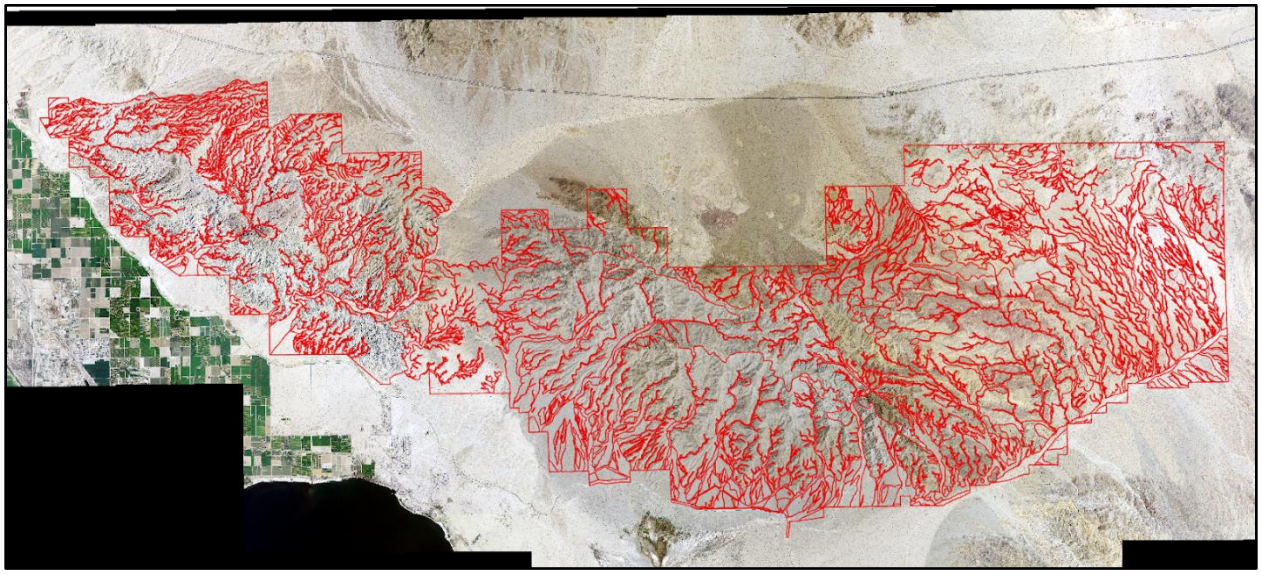


Figure 1: Mecca Hills and Orocopia Mountains vegetation map in Riverside County, California, shown with 2012 NAIP aerial imagery, completed by UCR CCB (Sweet et al., 2015).

PROJECT BACKGROUND

The California Department of Fish and Wildlife (CDFW) Vegetation Classification and Mapping Program (VegCAMP) requested the Center for Conservation Biology (CCB) at the University of California, Riverside, to reassign and standardize mapping attributes to the 2012-2015 vegetation map of the Mecca Hills and Orocopia Mountains, in Riverside County, California (Figure 1; Sweet et al., 2015) to align with current Survey of California Vegetation (SCV) state standards. This was initiated as part of a larger Colorado Desert vegetation mapping project, to be published concurrently with the map described in the present report (Barrios et al., 2026). The resulting revised map is the second edition of the vegetation map for the Mecca Hills and Orocopia Mountains Conservation Area using the 2012 National Agricultural Imagery Program (NAIP) imagery and complies with state-wide vegetation mapping standards. The reattribution aimed to standardize the assigned vegetation type or land use, provide more detailed information about vegetation cover and structure, and include additional CDFW VegCAMP and SCV standard attributes such as modifiers to indicate anthropogenic disturbance and presence of certain species of conservation concern (Appendix A; CDFW, 2024).

MAPPING AREA

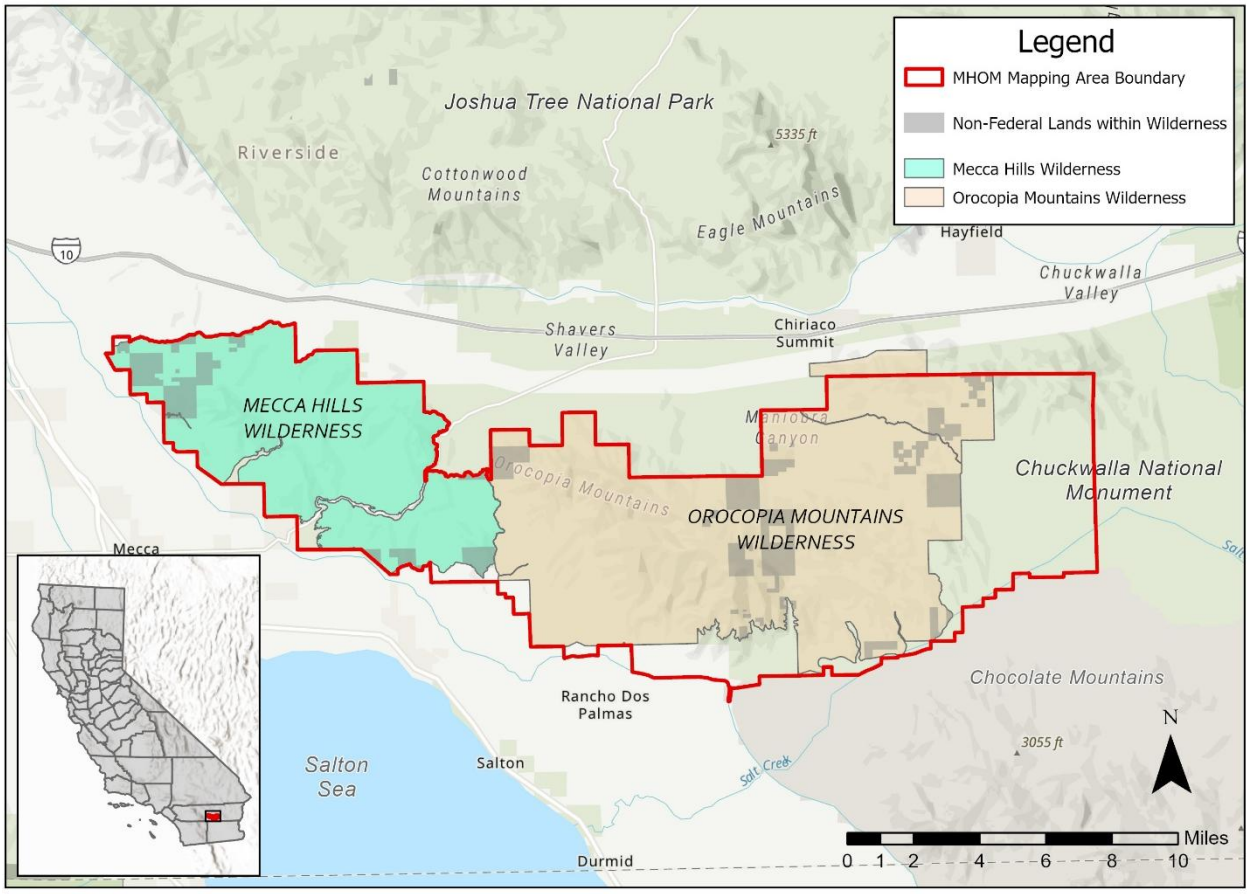


Figure 2: Map of the Mecca Hills and Orocopia Mountains Wilderness areas with the mapping area boundary.

The map covers the Mecca Hills and Orocopia Mountains Conservation Area, which spans approximately 112,830 acres (45,661 hectares) and is located southeast of the Coachella Valley in Riverside County, California (Figure 2). This area is within the federally designated Chuckwalla National Monument and is primarily made up of two undeveloped wilderness areas, the Orocopia Mountains Wilderness and the Mecca Hills Wilderness, with some private and county parcels scattered throughout. The mapping area primarily runs west to east: the Orocopia Mountains Wilderness makes up the central and eastern portion, and the Mecca Hills Wilderness make up the western portion (Figure 2). At the northern edge of the mapping area lies the transition zone between the Colorado Desert (a section of the Sonoran Desert) and the Mojave Desert in Joshua Tree National Park. To the south, the mapping area is bound by the edge of the Salton Sink with an elevation of 30 meters above sea level. The Mecca Hills, which are situated within the western half of the mapping area, are divided from the Orocopia

Mountains by a narrow valley formed from the Hidden Springs Fault which runs approximately from Shavers Valley in the north to the Salton Sea in the south. Precipitation is the primary driver for vegetation growth in the Colorado desert and rain is variable, with annual averages roughly two to four inches. Freezing temperatures are uncommon, especially at lower elevations (WRCC 2026).

The Mecca Hills are a small mountain range located in the western portion of the mapping area with a high point of approximately 553 meters. These hills are bound to the south by the San Andreas Fault and composed of primarily sedimentary alluvial deposits uplifted and contorted by fault activity (Morton et al., 1988). The erosion of the loose sedimentary geology type leads to abundant maze-like, steep-walled canyons. Sparsely vegetated Map Units such as the Mud Hills sparsely vegetated ephemeral herbs Mapping Unit and *Chorizanthe rigida – Geraea canescens* Desert Pavement Alliance are common. Slopes often have sparse cover of creosote bush (*Larrea tridentata*), brittlebush (*Encelia farinosa*), and burrobush (*Ambrosia dumosa*). Deep-cut and regularly flooded canyons and xeric washes support desert trees including ironwood (*Olneya tesota*), blue palo verde (*Parkinsonia florida*), and desert willow (*Chilopsis linearis*). Mecca aster (*Xylorhiza cognata*), a rare endemic perennial woody aster (CRPR 1B.2) protected under the CVMSHCP, is common within narrow canyons and steep, rocky hillslopes throughout the Mecca Hills.

The majority of the Orocopia Mountains geology is defined by the namesake geological type, Orocopia schist, however the eastern half of the range is more geologically variable and tends to favor uplifted and heavily eroded sedimentary deposits like the Mecca Hills (Jennings, 1967). Orocopia Mountain is the highest point of the range at 1,163 meters elevation, and the lowest point of this mapping area is at the base of the alluvial fans that flank the southern slope of the mountains. The Salton Creek Fault forms the valley that separates the Orocopia Mountains from the Chocolate Mountains to the southeast. Dominant vegetation communities are similar to the Mecca Hills, however there are more occurrences of species characteristic of the Mojave Desert along the northern slopes and higher elevations, primarily evident within stands of Mojave yucca (*Yucca schidigera*). Orocopia sage (*Salvia greatae*) is a rare shrub (CRPR 1B.3) protected under the CVMSHCP and is endemic to the Orocopia and Chocolate Mountains and a very small section of the eastern Mecca Hills. It is found throughout broad bajadas, canyons and southern slopes of Orocopia mountain in well-draining to rocky mixed alluvia and on Orocopia schist.

METHODS

MAP REATTRIBUTION OVERVIEW

In 2015, the team at UC Riverside CCB produced the first edition of the vegetation map for the Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP) under contract with the Coachella Valley Conservation Commission (CVCC). National Agricultural Imagery Program (NAIP) imagery in true-color and color infrared (CIR) from 2012, along with field surveys conducted between 2013 to 2015 were used for photo interpretation (Fig. 1; USDA, 2012, Sweet et al., 2015). In this 2026 reattribution, we applied the current SCV standards to the 2015 final map, including aligning to the state-standard vegetation classification presented in the Online MCV (CNPS, 2026) as well as the utilizing standard map attributes. The final mapping classification is updated to the current SCV standards and aligns with the mapping classification for other Colorado Desert maps, such as the Desert Renewable Energy Conservation Plan Vegetation Mapping Project (hereafter DRECP, see Menke et al., 2013; 2016; VegCAMP, 2013; Reyes et al., 2020; 2021; 2023) and the Colorado Desert Vegetation Mapping Project (hereafter COLO; Barrios et al., 2026; Table 1).

This second edition of the map retained the mapping rules and polygon delineations described and employed in the original version, except for the specific attributes and corrections described below. Remapping and/or altering polygons was not an objective of this project; therefore, minimum mapping unit (MMU) rules used for the original 2012-2015 effort were retained (see Sweet et al., 2015).

The map reattribution provides greater detail through the assignments of the following attributes and presence modifiers: vegetation cover (defined by herb, shrub, and hardwood and conifer tree cover), presence of microphyll woodland trees (*Parkinsonia florida* and/or *Olneya tesota)*, presence of species of conservation concern (*Salvia greatae* or *Xylorhiza cognata*), general anthropogenic alteration, development, roadedness, alteration to the local hydrology, and intensity of exotics (See Attribute Assignments section for descriptions; Table 1). These attributes were assigned using the mapping rules outlined in the DRECP, further defined below, and are compatible with both the DRECP and the COLO mapping report (see Table 1 and the Mapping Attributes Section; Reyes et al., 2021; Barrios et al., 2026). Presence modifier attributes used here are compatible with the DRECP and the COLO map, with the exception of Joshua tree (*Yucca brevifolia*), for which cover was attributed in the DRECP and included as an optional modifier in the COLO map, however because this species does not occur within the Colorado Desert, no attribute for Joshua trees was added for this map reattribution. All attributes are defined further below.

Table 1: Attributes assigned to the original 2012-2015 Mecca Hills-Orocopia Mountains vegetation map, the re-attributed 2026 map as described here, and adjacent or relevant vegetation maps in the Colorado Desert. "X" indicates that the attribute was assigned within the map; "---" indicates that attribute was not assigned. ' * ' Indicates that the attribute was assigned only in part.

"MHOM 2015" = Mecca Hills and Orocopia Mountains Vegetation Mapping Project [ds2692] (Sweet et al., 2015). "MHOM 2026" = The reattribution described here. "COLO 2026" = Colorado Desert Vegetation Mapping Project (Barrios et al., 2026). "DRECP 2016" = Desert Renewable Energy Conservation Plan Vegetation Mapping Project (ds735; Reyes et al., 2021). "DOPA 2019" = Dos Palmas Conservation Area Vegetation Mapping Project (ds2926; Sweet et al., 2019). "DTLA 2017" = Desert Tortoise Linkage Area Vegetation Mapping Project (ds2927; Sweet et al., 2017). "JOTR 2013" = Joshua Tree National Park Vegetation Mapping Project (ds730; La Doux et al., 2013). "ds" numbers are dataset identifiers used with the CDFW Biogeographic Information and Observation System (BIOS) online data viewer (CDFW BIOS, 2026).

Assigned Attributes	**MHOM 2015**	**MHOM 2026**	**COLO 2026**	**DRECP 2021**	**DOPA 2019**	**DTLA 2017**	**JOTR 2013**
MapClass	X	X	X	X	X	X	X
Association (under MapClass attribute)	X	X	---	---	---	---	X
Conifer Cover (ConCov)	---	X	X	X	---	---	---
Hardwood Cover (HdwdCov)	---	X	X	X	---	---	---
Total Tree Cover (TreeCover)	---	X	X	X	X	X	---
Shrub Cover (ShrubCover)	---	X	X	X	X	X	---
Herb Cover (HerCover)	---	X	X	X	X	X	---
Height Class	---	---	---	---	---	---	X
Density Class	---	---	---	---	---	---	X
Exotics	---	X	X	X	X	X	---
Roadedness Disturbance	---	X	X	X	X	X	---
Development Disturbance	---	X	X	X	X	X	---

Assigned Attributes	MHOM 2015	MHOM 2026	COLO 2026	DRECP 2021	DOPA 2019	DTLA 2017	JOTR 2013
Anthropogenically Altered Disturbance (AnthroAlter)	---	X	X	X	X	X	---
Altered Hydrologic Regime (HydroMod)	---	X	X	X	X	---	---
Land Use	---	X	X	X	---	---	X
Method ID	X	X	X	X	X	X	---
Survey ID	X	X	X	---	---	---	---
Ironwood-Blue Palo Verde Presence (OLTE_PAFL)	---	X	X	X*	---	---	---
Joshua Tree Cover	---	---	X	X	---	---	---
Tamarix spp. Presence	---	---	X	---	---	---	---
Mesquite Presence Modifier	---	---	X	---	---	---	---
California Fan Palm Presence Modifier	---	---	X	---	---	---	---
Xylorhiza cognata Presence (XYCO_pres)	X	X	---	---	---	---	---
Salvia greatae Presence (SAGR_pres)	X	X	---	---	---	---	---

MAPPING MATERIALS AND METHODS

The reattribution effort was conducted using a Dell XPS 13 9315 and Dell XPS 15 7590 with dual monitors. Computer workstations equipped with dual monitors enabled us to use secondary monitors to view ancillary imagery sources and ground photographs during map delineation on the primary monitor. All mapping was completed using Esri ArcGIS Pro software. The final vegetation map was delivered in an ArcGIS Pro 3.6.2 file geodatabase format.

The primary digital base imagery for the mapping project was 2012 National Agriculture Imagery Program (NAIP) with a spatial resolution of 60 centimeters. Both true-color and

color-infrared (CIR) imagery was used to evaluate similarities and differences among vegetation Map Units.

For the 2012-2015 vegetation map effort, mappers manually-delineated polygons on top of georeferenced NAIP imagery using manual photo interpretation (i.e. heads-up digitization). During the 2024-2026 reattribution process, photo interpreters reanalyzed each polygon using the 2012 NAIP imagery and assigned the additional attributes, described in the Mapping Attributes section in order to bring into SCV compliance. For the purposes of this report, 'mappers' refer to the team that interpreted and mapped the original 2012-2015 map, and 'photo interpreters' refer to the 2024-2026 team that contributed to the current reattribution effort.

Photo interpreters consulted publicly available imagery sources, including Google Earth and Google Maps. In some cases, photo interpreters reviewed historical imagery accessed through Google Earth to determine long-term vegetation trends and phenological variation. Although these supplemental sources informed interpretation, attribution decisions were based exclusively on the 2012 NAIP base imagery.

Description of Mapping Geodatabase and Quality Control Methods

Vegetation mapping data were compiled within an Esri File Geodatabase. The primary dataset consists of polygon features representing final vegetation Alliances and land use Map Units. Each polygon includes unique identifiers and standardized geometry fields.

Vegetation structure and composition were attributed using standardized fields describing each life form strata (conifer, hardwood, total tree, shrub, and herbaceous cover) and cover classes for each. Disturbance and modification attributes included anthropogenic alteration, development, roadedness, exotic species presence, hydrologic modification, and land use. Present effort photo interpreters used modifiers to record the presence of certain ecologically-important species and species with conservation concerns within polygons, using specific rules defined in the Mapping Attributes Section. These included: *Olneya tesota*, *Parkinsonia florida*, *Salvia greatae,* and *Xylorhiza cognata*. Attribute values were informed using a combination of photo interpretation, field-based surveys, and supplemental reference data; photo interpreters documented applicable reference sources in the MethodID field.

Certain Map Units were logically associated with pre-determined attribute values. For example, every polygon mapped to the *Parkinsonia florida – Olneya tesota* Alliance, or related Associations would automatically receive 'Present in At Least Trace Amounts and Consistent Throughout Most of the Stand' for the Ironwood-Blue Palo Verde Presence (OLTE_PAFL) Modifier. This also applied to the Built-Up Urban Map Unit, where photo interpreters did not estimate plant cover classes, roadedness, or hydrologic alteration, and thus marked these attributes as "Not Applicable/Not

Assigned". These attributes are described in detail in the Mapping Attributes subsection of the Mapping Criteria section. To ensure consistent attribution across these special Map Units, a "consistency table" for internal use by photo interpreters, which defined expected attribute values for certain vegetation and land use Map Units, was developed and used during photo interpretation and quality control.

Quality control was conducted iteratively and included spatial, attribute, and cross field validation. Attribute quality control verified consistency between Map Units, vegetation cover fields, and disturbance indicators, while cross-field validation used the consistency table to identify and resolve conflicting attribute combinations. Final validation confirmed that all polygons were assigned valid Map Units and attributes were applied consistently and in accordance with project classification rules. The final geodatabase met CDFW and DRECP vegetation mapping standards.

MAP CLASSIFICATION

The map classification used in the 2012-2015 map was generally based on the Manual of California Vegetation (Sawyer et al., 2009). As such, the map classification needed to be updated and validated to the current SCV and Online Manual of California Vegetation standards (CDFW, 2024; CNPS, 2026). UCR CCB updated the map classification using a crosswalk created with CDFW VegCAMP showing the original classification and its relation to the updated standard MCV vegetation types (Appendix A). When necessary, photo interpreters then reassigned polygons Map Units to reflect this updated classification.

The final mapping classification used for this project is based on the hierarchical SCV and United States National Vegetation Classification (USNVC, 2025) as defined in the Online Manual of California Vegetation (MCV; CNPS, 2026). The mapping classification is limited to the types present within the mapping area and to those types that are mappable as defined by SCV standards and interpretable from available spatial layers. The mapping classification contains mapping units, Alliances, and Associations. The 2012-2015 mappers assigned Associations only when there was verifiable survey data, and these associations were retained for this effort where they related to existing MCV vegetation types. Mapping units are mappable areas that are not included in the floristic vegetation classification or lack presence of defining vegetation. These mapping units include regions of sparse vegetation defined by geologic or topographic features, such as rocky outcrops and mud hills, and are also used to describe Miscellaneous Classes; areas that are highly built-up or anthropogenically altered, such as agricultural operations, urban development, and constructed areas. For the final map classification see Table 2 and for the final crosswalk see Appendix A.

The map classification used in the crosswalk for this effort was adapted from the mapping classification used by Aerial Information Systems, Inc. (AIS) in the DRECP

vegetation mapping project, which was provided by CDFW and further developed in the course of the 2013 and 2021 DRECP maps (Menke et al. 2013, Reyes et al. 2021). This classification was initially developed from the following mapping and classification projects in the Colorado/Sonoran and Mojave Deserts:

- Vegetation Mapping of Anza-Borrego Desert State Park and Environs (Keeler-Wolf et al., 1998)
- Mojave Desert Ecosystem Program's Vegetation Database (Thomas et al., 2004)
- Vegetation of Joshua Tree National Park (La Doux et al., 2013)
- Vegetation Classification and Mapping at Lake Mead National Recreation Area, Mojave National Preserve and Death Valley National Park (Evans et al., 2020).

Table 2: Final Map Units (mapping units/Alliances and Associations) with the total count of polygons assigned to the Unit and total area in acres of the Unit mapped.

Map Code	Map Class	Total Polygons	Total Acres
4111	*Ambrosia dumosa* Alliance	116	5403.55
41111	*Ambrosia dumosa* Association	1	4.64
7211	*Ambrosia salsola – Bebbia juncea* Alliance	20	369.68
20005	*Bebbia juncea* Association	3	119.06
5111	*Atriplex canescens* Alliance	4	5.60
6111	*Atriplex hymenelytra* Alliance	2	6.37
4113	*Atriplex polycarpa* Alliance	1	0.59
9300	Built-up/Urban Disturbance	2	41.51
7222	*Chilopsis linearis – Psorothamnus spinosus* Alliance	9	488.09
72221	*Chilopsis linearis – Ambrosia salsola* Association	1	268.95
6117	*Chorizanthe rigida – Geraea canescens* Desert Pavement Alliance	49	5404.45
4114	*Encelia farinosa* Alliance	41	1705.89
5419	*Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance	20	410.36
36002	*Lycium andersonii* Association	4	266.85
4119	*Larrea tridentata* Alliance	255	7465.20

Map Code	Map Class	Total Polygons	Total Acres
41192	*Larrea tridentata – Atriplex polycarpa* Association	1	57.77
4115	*Larrea tridentata – Ambrosia dumosa* Alliance	41	16826.81
4118	*Larrea tridentata – Encelia farinosa* Alliance	122	9964.14
71181	*Larrea tridentata – Encelia farinosa – Ambrosia dumosa* Association	2	3588.65
71183	*Larrea tridentata – Encelia farinosa – Fouquieria splendens* Association	1	25.86
6115	Massive Sparsely Vegetated Rock Outcrop Mapping Unit	36	33044.62
6113	Mud Hills sparsely vegetated ephemeral herbs Mapping Unit	51	13597.34
6110	North American Warm Semi-Desert Cliff, Scree & Pavement Sparse Vegetation Group	1	528.04
4227	*Parkinsonia florida – Olneya tesota* Alliance	164	7954.12
42271	*Olneya tesota – Larrea tridentata – Encelia farinosa* Association	1	2.69
54502	*Olneya tesota – Psorothamnus schottii* Association	3	547.27
54506	*Parkinsonia florida – Senegalia greggii – Encelia frutescens* Association	7	168.23
54507	*Parkinsonia florida – Chilopsis linearis* Association	2	318.00
42273	*Parkinsonia florida – Hyptis emoryi* Association	5	1291.74
4231	*Psorothamnus schottii* Mapping Unit	62	2245.01
4123	*Salvia greatae* Mapping Unit	2	0.81
4226	*Senegalia greggii – Hyptis emoryi – Justicia californica* Alliance	78	655.82
6114	Unvegetated wash and river bottom Mapping Unit	3	6.35
1415	*Washingtonia filifera* Alliance	1	0.32
9004	*Xylorhiza cognata* Mapping Unit	31	14.63
5424	*Yucca schidigera* Alliance	5	18.00
54241	*Yucca schidigera – Larrea tridentata – Ambrosia dumosa* Association	1	13.94
	Total	1148	112830.96

MAPPING CRITERIA

The mapping classification and rules for the reattribution, where possible without re-delineation, followed those set forth by the SCV, and were previously used for the DRECP vegetation mapping project, Mojave and Sonoran Desert, and Colorado Desert vegetation mapping projects. The mapping rules dictate how vegetation stands are delineated, and apply to all Map Units including Alliances, Associations, and mapping units or Miscellaneous Classes. Mapping units describe natural features outside of the floristic classification, such as sparsely vegetated areas (wash bottoms, rock outcrops, mud hills, etc.), as well as assemblages of plants that regularly occur together and thus have ecological value in mapping but would otherwise be unmappable due to being sub-MMUsize or difficulty differentiating when of mixed composition. Miscellaneous Classes described built-up or anthropogenically altered features, such as urban areas and aqueducts.

As described in the Map Reattribution Overview section, MMU rules used in the original map were retained. Polygons for most Map Units were mapped at a minimum area of 2.47 acres (1 ha). Types that occupied smaller habitats and are the focus of regional conservation priorities such as the *Xylorhiza cognata* Mapping Unit, *Salvia greatae* Mapping Unit, and *Washingtonia filifera* Woodland Alliance were mapped to a minimum of 0.3 acres. Minimum mapping width (MMW) rules define the minimum width of a mapped polygon, usually equal to approximately one-half the length of one side of a perfectly square MMU polygon and were implemented in most other vegetation maps. However, MMW was not considered in the original delineation of this map, and the present map does not make improvements to implement MMW rules.

Mapping Units

The mapping rules created for the 2012-2015 mapping effort included a focus on the presence of CVMSHCP-covered species (indicated as target species in the report), specifically Orocopia sage (*Salvia greatae)* and Mecca aster (*Xylorhiza cognata*). The *Salvia greatae* Mapping Unit was mapped in areas of canyon hillsides and bajadas in the Orocopia Mountains; and the *Xylorhiza cognata* Mapping Unit was typically mapped along and narrow slot canyons, canyon bottoms, and slopes in the Mecca Hills. For the initial 2012-2015 mapping effort, these types were mapped only when field verified and were mapped as Provisional Alliances although no formal classification analysis was completed. Polygons mapped to these types do not meet standard mapping rules, such as MMU, however, it was decided that these Map Units should be retained to preserve the fine-scale detail of these polygons which is useful for local conservation efforts.

These two types (*Xylorhiza cognata* and *Salvia greatae*) were re-attributed as mapping units in consultation with CDFW VegCAMP.

The 2012-2015 map classification also included a Provisional type for stands of *Psorothamnus schottii.* These stands generally occur with low, non-dominating cover of other shrub species such as *Larrea tridentata* and *Ambrosia dumosa* and are found in gradually sloping, rocky bajadas on the southern slopes of the Orocopia Mountains and throughout rocky, south-facing slopes in the Colorado Desert Mapping Project area. In this reattribution, *Psorothamnus schottii* stands were classified as a mapping unit. We advocate for the recognition of a new Alliance to represent these stands, and in the course of concurrent work for the Colorado Desert Mapping Project, UCR staff identified stands of this type and collected vegetation surveys following the CDFW-CNPS protocol for vegetation rapid assessment and relevés (available online at: https://www.cnps.org/wp-content/uploads/2024/11/CNPS-CDFW-RA-Releve_Protocol_Code-Key_Descriptions_Cover-Soil-Key_ADA-20240416.pdf) to support inclusion of this new type within the MCV.

Other Map Units that are non-anthropogenic and describe natural features outside of floristic classification used in this project are:

- Massive sparsely vegetated rock outcrop mapping unit
- Mud Hills sparsely vegetated ephemeral herbs mapping unit
- Unvegetated wash and river bottom mapping unit
- North American Warm Semi-Desert Cliff, Scree & Pavement Sparse Vegetation Group

Miscellaneous Classes

The mapping classification used for this project includes Miscellaneous Classes; Map Units that are anthropogenic and non-floristic such as built-up/urban features, agriculture, and man-made water storage or transfer structures. The area encompassed in this map is primarily undeveloped wilderness, and as such, only the Built-up & Urban Disturbance Map Unit was identified in this mapping area and this type was used to define mappable areas of infrastructure for the Coachella Canal on the southern edge of the mapping area.

These features are often easy to delineate due to complete or near-complete removal of natural vegetation within the feature, however there are also instances where anthropogenic structures and landscape alterations interface blend with surrounding natural stands of vegetation. In the latter case, when the mapper or photo interpreters must decide on the most appropriate Map Unit (a Map Class that reflects either the natural vegetation or the anthropogenic feature), priority is typically given to the natural

vegetation type. However, the geodatabase used in this project features a “Land Use” modifier where the photo interpreter can still record important anthropogenic influences such as agriculture, urban use, and restoration. The use of this modifier leads to “dual-coding” classes, where a polygon assigned a vegetation Map Unit can also have a Land Use modifier that reflects anthropogenic use. Dual-coding was not common in this mapping area due to the lack of visible human impact on the landscape; however, it was assigned in areas associated with the Coachella Canal to annotate ‘water transfer’ as a type of land use.

Mapping Attributes

The following additional map attribute fields were assessed for all polygons by photo interpreters in the 2024-2026 effort, except where otherwise described.

Percent Cover

“Percent cover” refers to the density of plants across a defined area as estimated from satellite imagery used for mapping during this project. For each polygon, photo interpreters estimated the total percent cover for each lifeform class (herb, shrub, and tree) and cover specifically for hardwood and conifer trees. Cover estimates were recorded in the geodatabase as one of the listed categories at the end of this section.

Photo interpreters only estimated percent coverage for plants that were visible on the overhead NAIP imagery used for this project; they did not attempt to estimate coverage of understory plants obscured by tree canopies. Since this mapping area is entirely within the Colorado Desert where plant cover is naturally sparse and trees are relatively rare, it was not common to encounter vegetation stands with a significant component of obscured understory vegetation.

Herbaceous cover in the Colorado Desert is extremely variable over time due to the unpredictable nature of precipitation events, and over space as extreme topographic exposures and dry air lacks the temperature buffering of more mesic environments, leading to highly localized microenvironments. On average, most precipitation is seasonal and primarily concentrated in the cooler months. However, summer monsoon storms can also contribute significantly to annual precipitation. While winter precipitation is generally more regular, all precipitation in the Colorado Desert is fairly unpredictable and years-long droughts are not uncommon. As such, herbaceous cover, which relies on seasonal precipitation (except in riparian zones), is unpredictable and any imagery dataset cannot represent the range of possible conditions: from a complete absence of herbaceous cover during dry seasons or drought, to nearly unbroken cover of annual herbs following particularly wet seasons. For the purposes of the reattribution, photo interpreters always deferred to the conditions represented in the 2012 NAIP imagery, however this region, and California, experienced a significant drought in the winter before the 2012 imagery was flown (USGS, 2026; WRCC, 2026).

Photo interpreters are usually able to differentiate between long-dead (more than one seasons past) herbaceous cover and recently-dead cover due to the color of the vegetation (gray colors in CIR indicate long-dead material, and straw-colors indicate recently-dead). For this project, recently-dead herbaceous vegetation was considered part of the total vegetation cover, but long-dead vegetation was excluded from any lifeform cover category.

Estimating percent cover is a subjective process. To maintain as much consistency as possible between photo interpreters regularly referenced the percent cover diagrams provided online by CNPS (https://www.cnps.org/wp-content/uploads/2024/11/CNPS-CDFW-RA-Releve_Protocol_Code-Key_Descriptions_Cover-Soil-Key_ADA-20240416.pdf). Below is a breakdown of the cover classes used in this project:

Cover classes used for conifer, hardwood, total tree, and shrub cover attributes:

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

Cover classes used for herbaceous cover attribute:

0: None or Not Observable.

1: >0-2%

2: >2-15%

3: >15-40%

4: >40

9: Not applicable/Not assigned

Exotics

Photo interpreters assessed cover of exotic plant species for every vegetation polygon. Intensity of exotics is categorized using SCV standards, shown in Table 3. It is important to note that photo interpreters considered recently-dead herbaceous exotics as part of the total exotics cover.

Exotic species diversity is fairly limited within this mapping area. Exotic non-annual plant species include *Tamarix aphylla* (tree) and shrubby *Tamarix* species (*T. chinensis* and *T. ramosissima*), which were identified by their unique photo signature and indicated by percent cover in this modifier. Other maps include a modifier for Tamarisk species; however, this modifier was not included in this reattribution. Annual exotic species, primarily Mediterranean grass (*Schismus barbartus* and *S. arabicus*), are found abundantly, and Sahara mustard (*Brassica tournefortii*) is common throughout the mapping area. For the most part, however, the cover of these species was not detectable on the 2012 NAIP imagery due to drought conditions.

Table 3: Explanation of Exotics Map Classes.

Code	Category	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.
1	Low: 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.
2	Moderate: Exotics (particularly herbaceous) significant and cover may exceed dominant vegetation strata (relative cover Between 33% and 66%)	Exotics, particularly herbaceous ones, are significant and cover may exceed the dominant vegetation strata.

Code	Category	Discussion
3	High: 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).
9	Not applicable/Not assigned	Exotics are not applicable when the Map Unit is 9210, 9220, 9300, 9310, 9800, 9801, 9803, 9804, 9805.

Development Disturbance

Photo interpreters attributed values to Development Disturbance to characterize the amount of manmade building that has affected a polygon. In the case of this map, these disturbances were associated with the Coachella Canal and flood control berms. Development Disturbance also includes non-permanent additions to the landscape, such as trailers, abandoned vehicles, large dump sites or discarded objects (big enough to see from imagery), and makeshift encampments which were not encountered within this area. The level of Development Disturbance for each polygon was determined based on the percentage of the polygon occupied by these structures, as described in Table 5.

Table 4: Explanation of Development Disturbance Map Classes

Code	Category	Explanation
0	None visible	No evidence of structures or dumping within the polygon
1	Low	<2% of polygon occupied by structures or dumping
2	Moderate	Between 2% to 5% of polygon occupied by structures or dumping
3	High	Over 5% of polygon occupied by structures or dumping
9	Not Applicable/Not Assigned	Development Disturbance is not estimated for Map Units 9200, 9210, 9220, 9801

Roadedness Disturbance

"Roadedness" refers to the amount of a polygon that is bisected by roads intended for vehicles. Photo interpreters considered both paved and unpaved roads to contribute to Roadedness; unpaved roads must be well-worn and regularly travelled routes, either in the past or present, and not just a single set of tracks left from one or two vehicles. Photo interpreters determined roadedness by estimating the amount of habitat within the polygon that is left intact and not intersected by a road, as demonstrated in Table 4 and Figure 3.

Table 5: Explanation of Roadedness Disturbance Map Classes

Code	Category	Explanation	Example
0	None	No roads detected within polygon	N/A
1	Low	At least 2/3 of the polygon are left intact	See Figure 3a
2	Moderate	Between 2/3 and 1/3 of the polygon are left intact	See Figure 3b
3	High	Less than 1/3 of the polygon is left intact	See Figure 3c
9	Not Applicable	Roadedness not estimated for 9200, 9210, 9220, 9300, 9310, 9800, 9801, 9803, 9804, 9805	N/A

a.  b. 

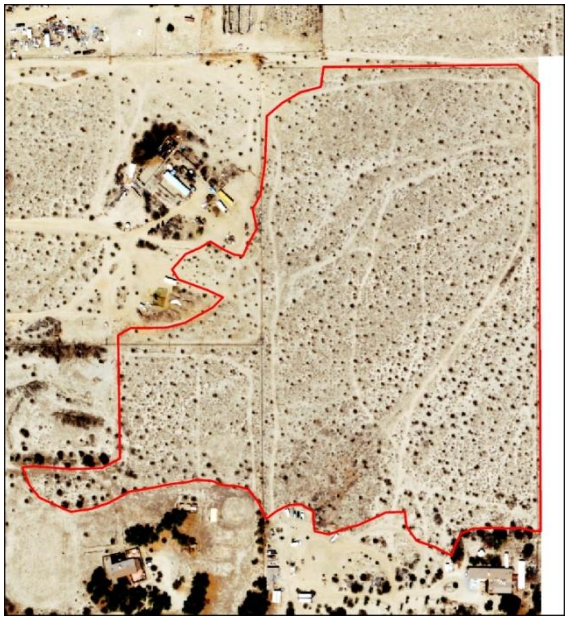
c. 

Figure 3: Examples of a vegetations with roadedness. a. Low roadedness. b. Moderate roadedness. c. High roadedness

Anthropogenically Altered Disturbance (AnthroAlt)

Photo interpreters assigned a value for Anthropogenically Altered Disturbance based on the amount of human disturbance present in a polygon that is not covered by the Development Disturbance attribute (i.e. disturbance unrelated to structures or dumping sites; Table 6). This type of disturbance generally involves a noticeable removal of natural vegetation (grading for construction, residential parcels, mining, weed control, etc.) or signs of removal in the past (old till lines still present, most apparent on land previously used for agriculture).

Table 6: Explanation of Anthropogenically Altered Disturbance Map Classes

Code	Category	Explanation
0	None visible	No evidence of past or present Anthropogenically Altered Disturbance
1	Low	Less than 33% of polygon is affected
2	Moderate	Between 33% and 66% of polygon is affected
3	High	Over 66% of polygon is affected
9	Not applicable/Not assigned	Not assigned for Map Unit 9801

Altered Hydrologic Regime Modifier (HydroMod)

Altered Hydrologic Regime modifier indicates when a cover class or vegetation type difference is delineated as a result of an impediment or redirection of an upslope water source. This modifier was applied where flood control berms funnel dispersed sheet flow over a wide area into a narrow channel, leading to a change or increase in riparian or desert woodland vegetation on the downstream side of the funnel's "spout" which would not normally be present without this funneling effect, as seen in the example in Figure 4. In other maps with this modifier, it was only applied for polygons that experienced effects of water diversion on the downslope side of the impediment. However, because this map was initially delineated without this modifier, some polygons have an altered hydrologic regime in only a portion of the polygon. Where this was true, we indicated that the polygon was affected if at least part of the polygon was affected by water diversion.

Table 7: Explanation of Altered Hydrologic Regime Map Classes

Code	Category	Explanation
0	Not affected	No water flow impediment exists which results in a cover class or vegetation type break between polygons
1	Affected	An impediment exists upslope of the polygon which affects the natural flow of water, resulting in a change in cover class or vegetation type of the polygon. See Figure 4 for an example.
9	Not applicable/Not assigned	Not assigned for Map Units 9300, 9310, 9800, 9801, 9803, 9804, 9805

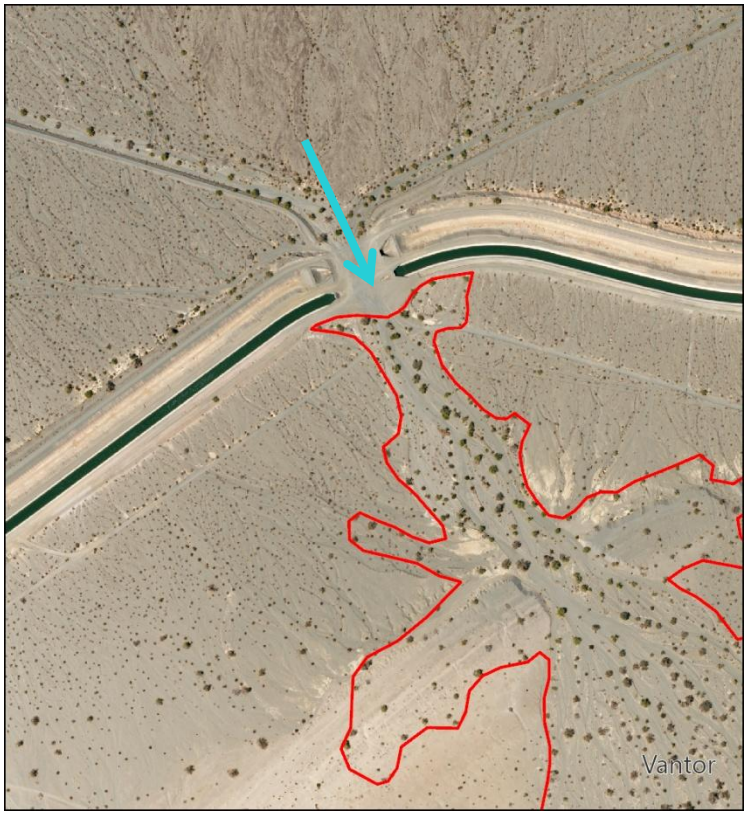


Figure 4: Example of a stand of vegetation that is hydrologically altered. The blue arrow indicates the direction of surface water flow, which has been altered by the construction of earthen berms that funnel sheet flow through a narrow corridor, resulting in the establishment of a *Parkinsonia florida* and *Olneya tesota* woodland in a wash that would otherwise not exist without this upstream anthropogenic alteration.

Ironwood – Blue Palo Verde Presence Modifier (OLTE_PAFL)

Photo interpreters used the Ironwood – Blue Palo Verde Presence modifier to indicate polygons that contain at least trace amounts of either blue palo verde (*Parkinsonia florida*), desert ironwood (*Olneya tesota*), or both, consistently spread across the polygon (Table 8). This modifier helps to describe polygons that are not mapped as the *Parkinsonia florida - Olneya tesota* Alliance yet still contain one or both of these ecologically important species spread characteristically across the landscape, such as many instances of desert pavement, relatively sparsely vegetated washes, or broad alluvial fans reaching down from, primarily, the Orocopia Mountains. By default, photo interpreters also assigned polygons mapped as *Parkinsonia florida - Olneya tesota* Alliance a 1 (present).

Table 8: Explanation of Ironwood – Blue Palo Verde Presence Modifier Map Classes

Code	Category	Explanation
0	Not present	No *Parkinsonia florida* or *Olneya tesota* are present within the polygon, or, if present, they are not consistently spread across the polygon.
1	Present	Either *Parkinsonia florida*, *Olneya tesota*, or both are present in at least trace amounts and consistently spread across the polygon.

Land Use Modifiers

The LandUse modifier identifies secondary anthropogenic attributes of a polygon that may otherwise be lost if only a vegetation type or miscellaneous Map Class is attributed. Photo interpreters adopted this Land Use code system from the DRECP, which took it from the Southern California Land Use Consortium/ Southern California Association of Government's Land Use Classification (Johnson and Reyes, 1990), which is based on Anderson et al. (1972). A table containing all Land Use codes and their designations, plus descriptions of each Land Use code, are described below, along with their typical application (Table 9). The only Land Use modifier photo interpreters used here was 'Water Transfer' for polygons that included the Coachella Canal.

Table 9: Land Use Codes and Designations

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

Not Assigned/Not Assessed (0000)

This code applies to polygons that do not have a noteworthy underlying secondary anthropogenic use. Most polygons of natural vegetation type are assigned this code.

Urban (1000)

This code is applied to polygons that are intensely built-up with structures (residential, industrial, utility, etc.), freeways, railroads, major highways, and associated parking lots, surface streets, and access roads. No polygons in this mapping area received this code.

Water Transfer (major canals, aqueducts, and agricultural channels) (1436)

Photo interpreters use this code to identify polygons that describe major domestic and agricultural water conveyance channels, specifically the Coachella Canal. All polygons designated a Map Unit of Major Canals and Aqueducts (9804) and polygons of Agriculture (9200) that denote agricultural channels receive this code.

Wildlife Preserves & Sanctuaries (1850)

This code is applied to actively managed areas, either public or private, that serve as wildlife preserves or refuges. No polygons in this mapping area received this code.

Agriculture (Includes Nurseries) (2000)

Photo interpreters used this general code to refer to agricultural practices outside of annual field crops, orchards, or vineyards, which have dedicated Land Use codes (Non-woody Row and Field Crops (2100) and Orchards & Vineyards (2200)). Areas that received an Agriculture (2000) code included dairies, plant nurseries, and indoor or greenhouse facilities where we could not determine the type of plant product. All polygons with a Map Unit of Agriculture (9200) received this code, however no polygons in this mapping area received this Map Unit or code.

Non-woody Row & Field Crops (2100)

Photo interpreters used this code for plots of land dedicated to growing annual field crops. Fields that did not currently have crops were also given this code if they had been planted in the last five years. The Map Unit Non-Woody Row and Field Agriculture (9220) always received this code, however no polygons in this mapping area received this Map Unit or code.

Orchards & Vineyards (2200)

Photo interpreters used this code for agricultural operations growing trees or grapes. This includes date palm plantations. Inactive/abandoned orchards still received this

code unless all trees had been removed. All polygons mapped as Woody Agriculture (orchards, vineyards) (9210) were given this Land Use code, however no polygons in this mapping area received this Map Unit or code.

Improved Pastureland (Irrigated) (2300)

This Land Use code applies to fields that are irrigated and maintained for the purpose of livestock grazing. This does not include small corrals or livestock pens associated with residential properties, which would be considered part of a Built-Up & Urban Disturbance (9300) with a Land Use code of Urban (1000). Photo interpreters gave the Improved Pastureland (Irrigated) (2300) code to all polygons mapped as Irrigated Pastures (9230), however no polygons in this mapping area received this Map Unit or code.

Vacant Land - Restoration (3500)

This code applies to areas where managed restoration is taking place. New restoration areas that have been planted but have not yet reached >2% vegetation cover are mapped as Restoration (9400) and given this Land Use code, however photo interpreters did not encounter this scenario within this mapping area.

Undifferentiated Water (9800)

This code was applied to natural or artificial bodies of water, such as ponds, lakes, and rivers. This does not include bodies of water that are associated with utility or industrial practices, such as sewage treatment, aquaculture, or agriculture (when impoundment feature is dry), which are treated as a Water Impoundment Feature (9805) and given a Land Use code of Water Impoundment Feature (9810). No polygons in this mapping area received this code.

Water Impoundment Feature (9810)

Photo interpreters used this code for polygons mapped as Water Impoundment Feature (9805), which include manmade, usually bermed or concrete-lined holding ponds for industrial or utility purposes such as agriculture, sewage treatment, and aquaculture. Agricultural water impoundment ponds are only mapped as Water Impoundment Feature (9810) if dry, otherwise they are mapped as Water (9800) with a Land Use code of Undifferentiated Water (9800). No polygons in this mapping area received this code.

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APPENDIX A: 2012-2015 MECCA HILLS AND OROCOPIA MOUNTAINS VEGETATION MAPPING UNITS AND 2025 REATTRIBUTION CROSSWALK

Appendix A: Table showing crosswalk of Alliances, mapping units, and Associations mapped in the 2012-2015 mapping effort, and the translation to types in the SCV used in the 2026 reattribution, with CA Codes, Map Codes and discussion notes on why a change was made. "---" indicates no data..

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
Acacia greggii Shrubland Alliance	---	*Senegalia greggii – Hyptis emoryi – Justicia californica* Alliance	---	33.045.00 (4226)	Corrected to MCV name
Acacia greggii Shrubland Alliance	*Acacia greggii--Ambrosia salsola* Association	*Senegalia greggii – Hyptis emoryi – Justicia californica* Alliance	---	33.045.00 (4226)	Invalid Association, defaulted to Alliance
Acacia greggii Shrubland Alliance	*Acacia greggii / Xylorhiza cognata* Association	*Senegalia greggii – Hyptis emoryi – Justicia californica* Alliance	---	33.045.00 (4226)	Invalid Association, defaulted to Alliance
Ambrosia dumosa Shrubland Alliance	*Ambrosia dumosa--Salvia greatae* Association	*Ambrosia dumosa* Alliance	---	33.060.00 (4111)	Invalid Association, defaulted to Alliance
Ambrosia dumosa Shrubland Alliance	*Ambrosia dumosa--Hyptis emoryi* Association	*Ambrosia dumosa* Alliance	---	33.060.00 (4111)	Mapping rules not met, defaulted to Alliance

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
Ambrosia dumosa Shrubland Alliance	---	*Ambrosia dumosa* Alliance	---	33.060.00 (4111)	OK
Ambrosia dumosa Shrubland Alliance	*Ambrosia dumosa* Association	*Ambrosia dumosa* Alliance	*Ambrosia dumosa* Association	33.060.02 (41111)	OK
Ambrosia salsola Shrubland Alliance	---	*Ambrosia salsola - Bebbia juncea* Alliance	---	33.200.00 (7211)	Corrected to MCV name
Ambrosia salsola Shrubland Alliance	*Ambrosia salsola-- Larrea tridentata* Association	*Ambrosia salsola – Bebbia juncea* Alliance	---	33.200.10 (7211)	Mapping rules not met, defaulted to Alliance
Ambrosia salsola Shrubland Alliance	*Ambrosia salsola-- Psorothamnus schottii* Association	*Larrea tridentata* Alliance	---	33.200.09 (4119)	Mapping rules not met, defaulted to Alliance
Atriplex canescens Shrubland Alliance	*Atriplex canescens-- Xylorhiza cognata* Shrubland Alliance	*Atriplex canescens* Alliance	---	36.310.00 (5111)	Invalid Association, defaulted to Alliance
Atriplex canescens Shrubland Alliance	---	*Atriplex canescens* Alliance	---	36.310.00 (5111)	OK
Atriplex canescens -- Atriplex polycarpa Shrubland Provisional Alliance	*Atriplex canescens-- Atriplex polycarpa-- Atriplex hymenelytra* Association	*Atriplex hymenelytra* Alliance	---	36.330.00 (6111)	Invalid Association, defaulted to Alliance

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
Atriplex hymenelytra Alliance	---	*Atriplex hymenelytra* Alliance	---	36.330.00 (6111)	OK
Atriplex polycarpa Shrubland Alliance	*Atriplex polycarpa*--*Larrea tridentata* Association	*Larrea tridentata* Alliance	*Larrea tridentata* – *Atriplex polycarpa* Association	33.010.12 (41192)	Corrected Hierarchy
Atriplex polycarpa Shrubland Alliance	*Atriplex polycarpa*--*Ambrosia salsola* Association	*Atriplex polycarpa* Alliance	---	36.340.00 (4113)	Invalid Association, defaulted to Alliance
Atriplex polycarpa Shrubland Alliance	---	*Atriplex polycarpa* Alliance	---	36.340.00 (4113)	OK
Chilopsis linearis Woodland Alliance	*Chilopsis linearis* / *Ambrosia salsola* Association	*Chilopsis linearis* – *Psorothamnus spinosus* Alliance	*Chilopsis linearis* – *Ambrosia salsola* Association	61.550.02 (42221)	Corrected Hierarchy
Chilopsis linearis Woodland Alliance	*Chilopsis linearis*--*Parkinsonia florida* Association	*Parkinsonia florida* – *Olneya tesota* Alliance	*Parkinsonia florida* – *Chilopsis linearis* Association	61.545.07 (54507)	Corrected Hierarchy
Chilopsis linearis Woodland Alliance	---	*Chilopsis linearis* – *Psorothamnus spinosus* Alliance	---	61.555.00 (7222)	Corrected to MCV name
Chilopsis linearis Woodland Alliance	*Chilopsis linearis*--*Psorothamnus spinosus* Association	*Chilopsis linearis* – *Psorothamnus spinosus* Alliance	---	61.555.00 (7222)	Invalid Association, defaulted to Alliance

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
Chilopsis linearis Woodland Alliance	*Parkinsonia florida--Olneya tesota* Association	*Parkinsonia florida – Olneya tesota* Alliance	---	61.545.00 (4227)	Invalid Association, defaulted to Alliance
Disturbed/built-up	---	Built-up and Urban Disturbance	---	--- (9300)	Corrected to standard Mapping Unit
Encelia farinosa Shrubland Alliance	*Encelia farinosa--Atriplex hymelytra* Association	*Encelia farinosa* Alliance	---	33.030.00 (4114)	Invalid Association, defaulted to Alliance
Encelia farinosa Shrubland Alliance	*Encelia farinosa--Psorothamnus schottii / Parkinsonia florida* Association	*Encelia farinosa* Alliance	---	33.030.00 (4114)	Invalid Association, defaulted to Alliance
Encelia farinosa Shrubland Alliance	*Encelia farinosa--Salvia greatae* Association	*Encelia farinosa* Alliance	---	33.030.00 (4114)	Invalid Association, defaulted to Alliance
Encelia farinosa Shrubland Alliance	*Encelia farinosa* Association	*Encelia farinosa* Alliance	---	33.030.00 (4114)	Mapping rules not met, defaulted to Alliance
Encelia farinosa Shrubland Alliance	---	*Encelia farinosa* Alliance	---	33.030.00 (4114)	OK
Geraea canescens--Chorizanthe rigida Desert Pavement	---	*Chorizanthe rigida – Geraea canescens* Desert	---	22.310.00 (6117)	OK

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
Annual Herbaceous Alliance		Pavement Annual Alliance			
Hyptis emoryi Shrubland Alliance	---	*Senegalia greggii – Hyptis emoryi – Justicia californica* Alliance	---	33.045.00 (4226)	Corrected to MCV name
Hyptis emoryi Shrubland Alliance	*Hyptis emoryii-- Encelia farinosa* Association	*Senegalia greggii – Hyptis emoryi – Justicia californica* Alliance	---	33.045.00 (4226)	Invalid Association, defaulted to Alliance
Larrea tridentata Shrubland Alliance	*Larrea tridentata-- Ambrosia dumosa* Association	*Larrea tridentata – Ambrosia dumosa* Alliance	---	33.140.00 (4115)	Invalid Association, defaulted to Alliance
Larrea tridentata Shrubland Alliance	*Larrea tridentata-- Salvia greatae* Association	*Larrea tridentata* Alliance	---	33.140.04 (4119)	Invalid Association, defaulted to Alliance
Larrea tridentata Shrubland Alliance	*Larrea tridentata-- Xylorhiza cognata* Association	*Larrea tridentata* Alliance	---	33.140.04 (4119)	Invalid Association, defaulted to Alliance
Larrea tridentata Shrubland Alliance	*Larrea tridentata-- Ambrosia dumosa--Encelia farinosa* Association	*Larrea tridentata – Encelia farinosa* Alliance	---	33.027.00 (4118)	Invalid hierarchy, corrected
Larrea tridentata Shrubland Alliance	*Larrea tridentata-- Encelia farinosa* Association	*Larrea tridentata – Encelia farinosa* Alliance	---	33.027.00 (4118)	Mapping rules not met, defaulted to Alliance

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
Larrea tridentata Shrubland Alliance	*Larrea tridentata - Psorothamnus schottii* Association	*Larrea tridentata* Alliance	---	33.140.04 (4119)	Mapping rules not met, defaulted to Alliance
Larrea tridentata Shrubland Alliance	*Larrea tridentata* Association	*Larrea tridentata* Alliance	---	33.140.04 (4119)	Mapping rules not met, defaulted to Alliance
Larrea tridentata Shrubland Alliance	*Larrea tridentata--Ambrosia salsola--Psorothamnus schottii* Association	*Larrea tridentata* Alliance	---	33.140.04 (4119)	Mapping rules not met, defaulted to Alliance
Larrea tridentata Shrubland Alliance	---	*Larrea tridentata* Alliance	---	33.010.00 (4119)	OK
Larrea tridentata--Ambrosia dumosa Shrubland Alliance	*Larrea tridentata--Ambrosia dumosa--Psorothamnus schottii--Encelia farinosa* Association	*Larrea tridentata – Ambrosia dumosa* Alliance	---	33.140.00 (4115)	Invalid Association, defaulted to Alliance
Larrea tridentata--Ambrosia dumosa Shrubland Alliance	*Ambrosia dumosa--Atriplex hymenelytra* Association	*Larrea tridentata – Ambrosia dumosa* Alliance	---	36.330.02 (4115)	Invalid hierarchy, defaulted to Alliance
Larrea tridentata--Ambrosia dumosa Shrubland Alliance	*Larrea tridentata--Ambrosia dumosa* Association	*Larrea tridentata – Ambrosia dumosa* Alliance	---	33.140.00 (4115)	Mapping rules not met, defaulted to Alliance

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
Larrea tridentata--Ambrosia dumosa Shrubland Alliance	*Larrea tridentata--Ambrosia dumosa--Encelia farinosa* Association	*Larrea tridentata – Ambrosia dumosa* Alliance	---	33.140.00 (4115)	Mapping rules not met, defaulted to Alliance
Larrea tridentata--Ambrosia dumosa Shrubland Alliance	*Larrea tridentata--Ambrosia dumosa--Atriplex* spp. Shrubland Alliance	North American Warm Semi-Desert Cliff, Scree & Pavement Sparse Vegetation Group	---	--- (6110)	Mapping rules not met, defaulted to Alliance
Larrea tridentata--Ambrosia dumosa Shrubland Alliance	---	*Larrea tridentata – Ambrosia dumosa* Alliance	---	33.140.00 (4115)	OK
Larrea tridentata--Encelia farinosa Shrubland Alliance	*Larrea tridentata--Encelia farinosa--Ambrosia salsola--Psorothamnus schottii* Association	*Larrea tridentata – Encelia farinosa* Alliance	---	33.027.00 (4118)	Invalid Association, defaulted to Alliance
Larrea tridentata--Encelia farinosa Shrubland Alliance	*Larrea tridentata--Encelia farinosa--Psorothamnus schottii--* Association	*Larrea tridentata – Encelia farinosa* Alliance	---	33.027.00 (4118)	Invalid Association, defaulted to Alliance
Larrea tridentata--Encelia farinosa Shrubland Alliance	*Larrea tridentata--Encelia farinosa* Association	*Larrea tridentata – Encelia farinosa* Alliance	---	33.027.00 (4118)	Invalid hierarchy, corrected

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
Larrea tridentata-- *Encelia farinosa* Shrubland Alliance	---	*Larrea tridentata – Encelia farinosa* Alliance	---	33.027.00 (4118)	OK
Larrea tridentata-- *Encelia farinosa* Shrubland Alliance	*Larrea tridentata*-- *Encelia farinosa*-- *Ambrosia dumosa* Shrubland Association	*Larrea tridentata – Encelia farinosa* Alliance	*Larrea tridentata – Encelia farinosa – Ambrosia dumosa* Shrubland Association	33.027.03 (71181)	OK
Larrea tridentata-- *Encelia farinosa* Shrubland Alliance	*Larrea tridentata*-- *Encelia farinosa*-- *Fouquieria splendens* Association	*Larrea tridentata – Encelia farinosa* Alliance	*Larrea tridentata – Encelia farinosa – Fouquieria splendens* Association	33.027.04 (71183)	OK
Lycium andersonii Shrubland Alliance	---	*Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance	---	33.185.00 (5419)	Corrected to MCV name
Massive sparsely vegetated rock outcrop	---	*Chorizanthe rigida – Geraea canescens* Desert Pavement Annual Alliance	---	22.310.00 (6117)	Polygons evaluated separately
Massive sparsely vegetated rock outcrop	---	North American Warm Semi-Desert Cliff, Scree & Pavement	---	--- (6110)	Polygons evaluated separately

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
		Sparse Vegetation Group			
Mud Hills sparsely vegetated ephemeral herbs	---	Mud Hills sparsely vegetated ephemeral herbs Mapping Unit	---	--- (6113)	Corrected to standard Mapping Unit
Non-vegetated Habitat (less than 2% absolute cover)	Non-vegetated habitat / *Encelia farinosa* Association	*Encelia farinosa* Alliance	---	33.030.00 (4114)	Invalid Map Class, polygons evaluated separately
Non-vegetated Habitat (less than 2% absolute cover)	---	Unvegetated wash and river bottom Mapping Unit	---	--- (6114)	Invalid Map Class, polygons evaluated separately
Non-vegetated Habitat (less than 2% absolute cover)	---	Massive Sparsely Vegetated Rock Outcrop Mapping Unit	---	--- (6115)	Invalid Map Class, polygons evaluated separately
Non-vegetated Habitat (less than 2% absolute cover)	---	North American Warm Semi-Desert Cliff, Scree & Pavement Sparse Vegetation Group	---	--- (6110)	Invalid Map Class, polygons evaluated separately
Non-vegetated Habitat (less than 2% absolute cover)	Non-vegetated Habitat / *Larrea tridentata* Association	North American Warm Semi-Desert Cliff, Scree & Pavement	---	--- (6110)	Invalid Map Class, polygons evaluated separately

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
		Sparse Vegetation Group			
Non-vegetated Habitat (less than 2% absolute cover)	Non-vegetated habitat / *Larrea tridentata* Association-- *Xylorhiza cognata* Association	North American Warm Semi-Desert Cliff, Scree & Pavement Sparse Vegetation Group	---	--- (6110)	Invalid Map Class, polygons evaluated separately
Non-vegetated Habitat (less than 2% absolute cover)	Non-vegetated Habitat / *Larrea tridentata*-- *Ambrosia dumosa* Association	North American Warm Semi-Desert Cliff, Scree & Pavement Sparse Vegetation Group	---	--- (6110)	Invalid Map Class, polygons evaluated separately
Non-vegetated Habitat (less than 2% absolute cover)	Non-vegetated habitat / *Xylorhiza cognata* Association	North American Warm Semi-Desert Cliff, Scree & Pavement Sparse Vegetation Group	---	--- (6110)	Invalid Map Class, polygons evaluated separately
Non-vegetated Habitat (less than 2% absolute cover)	---	*Chorizanthe rigida – Geraea canescens* Desert Pavement Annual Alliance	---	22.310.00 (6117)	Invalid Map Class, polygons evaluated separately

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
North American warm desert bedrock cliff and outcrop Group	---	North American Warm Semi-Desert Cliff, Scree & Pavement Sparse Vegetation Group	---	--- (6110)	Invalid Map Class, polygons evaluated separately
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida--Chilopsis linearis / Prosopsis glandulosa* Association	*Parkinsonia florida – Olneya tesota* Alliance	*Parkinsonia florida – Chilopsis linearis* Association	61.545.07 (54507)	Corrected to MCV name
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida--Psorothamnus spinosus / Hyptis emoryi* Association	*Parkinsonia florida – Olneya tesota* Alliance	*Parkinsonia florida – Hyptis emoryi* Association	61.545.08 (42273)	Corrected to MCV name
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida--Psorothamnus spinosus / Prosopsis glandulosa* Association	*Parkinsonia florida – Olneya tesota* Alliance	*Parkinsonia florida – Hyptis emoryi* Association	61.545.08 (42273)	Corrected to MCV name
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida / Acacia greggii* Association	*Parkinsonia florida – Olneya tesota* Alliance	*Parkinsonia florida – Senegalia greggii – Encelia frutescens* Association	61.545.06 (54506)	Corrected to MCV name

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida--Olneya tesota / Acacia greggii* Association	*Parkinsonia florida – Olneya tesota* Alliance	*Parkinsonia florida – Senegalia greggii – Encelia frutescens* Association	61.545.06 (54506)	Corrected to MCV name
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida / Encelia farinosa* Association	*Parkinsonia florida – Olneya tesota* Alliance	*Olneya tesota – Psorothamnus schottii* Association	61.545.02 (54502)	Invalid association, evaluated and corrected
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida / Acacia greggii--Hyptis emoryi* Association	*Larrea tridentata* Alliance	---	33.010.00 (4119)	Invalid association, evaluated and corrected
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida / Bebbia juncea--Encelia farinosa--Salvia greatae* Association	*Parkinsonia florida – Olneya tesota* Alliance	---	61.545.00 (4227)	Invalid Association, defaulted to Alliance
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida / Psorothamnus schottii* Association	*Parkinsonia florida – Olneya tesota* Alliance	---	61.545.00 (4227)	Invalid Association, defaulted to Alliance
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida--Olneya tesota / Psorothamnus schottii* Association	*Parkinsonia florida – Olneya tesota* Alliance	---	61.545.00 (4227)	Invalid Association, defaulted to Alliance
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida / Ambrosia salsola* Association	*Ambrosia salsola – Bebbia juncea* Alliance	---	33.200.00 (7211)	Invalid hierarchy, corrected

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
Parkinsonia florida--Olneya tesota Woodland Alliance	*Phragemytes australis / Ambrosia salsola* Association	*Ambrosia salsola – Bebbia juncea* Alliance	---	33.200.00 (7211)	Invalid hierarchy, corrected
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida / Bebbia juncea* Association	Ambrosia salsola – Bebbia juncea Alliance	Bebbia juncea Association	33.200.05 (20005)	Invalid hierarchy, corrected
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida / Lycium andersonii* Association	*Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance	*Lycium andersonii* Association	33.360.02 (36002)	Invalid hierarchy, corrected
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida--Olneya tesota / Atriplex (canescens & polycarpa*) Association	*Parkinsonia florida – Olneya tesota* Alliance	*Olneya tesota – Psorothamnus schottii* association	61.545.02 (54502)	Invalid hierarchy, corrected
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida / Larrea tridentata--Ambrosia dumosa* Association	*Parkinsonia florida – Olneya tesota* Woodland Alliance	---	61.545.00 (4227)	Mapping rules not met, defaulted to Alliance
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida / Larrea tridentata--Encelia farinosa* Association	*Parkinsonia florida – Olneya tesota* Alliance	---	61.545.00 (4227)	Mapping rules not met, defaulted to Alliance

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida--Olneya tesota* Association	*Parkinsonia florida – Olneya tesota* Alliance	---	61.545.00 (4227)	Mapping rules not met, defaulted to Alliance
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida--Olneya tesota--Psorothamnus spinosus* Association	*Parkinsonia florida – Olneya tesota* Alliance	---	61.545.00 (4227)	Mapping rules not met, defaulted to Alliance
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida-- Psorothamnus spinosus / Chilopsis linearis* Association	*Parkinsonia florida – Olneya tesota* Alliance	---	61.545.00 (4227)	Mapping rules not met, defaulted to Alliance
Parkinsonia florida--Olneya tesota Woodland Alliance	---	*Parkinsonia florida – Olneya tesota* Alliance	---	61.545.00 (4227)	OK
Parkinsonia florida--Olneya tesota Woodland Alliance	*Olneya tesota / Larrea tridentata--Encelia farinosa* Association	*Parkinsonia florida – Olneya tesota* Alliance	*Olneya tesota – Larrea tridentata – Encelia farinosa* Association	61.545.03 (42271)	OK
Parkinsonia florida--Olneya tesota Woodland Alliance	*Olneya tesota / Psorothamnus schottii* Association	*Parkinsonia florida – Olneya tesota* Alliance	*Olneya tesota – Psorothamnus schottii* Association	61.545.02 (5450)	OK
Parkinsonia florida--Olneya tesota Woodland Alliance	*Parkinsonia florida / Hyptis emoryi* Association	*Parkinsonia florida – Olneya tesota* Alliance	*Parkinsonia florida – Hyptis emoryi* Association	61.545.08 (42273)	OK

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
Prosopis glandulosa Woodland Alliance	*Parkinsonia florida / Lycium andersonii* Association	*Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance	*Lycium andersonii* Association	33.360.02 (36002)	Corrected to MCV name
Psorothamnus schottii Provisional Alliance	*Psorothamnus schottii--Larrea tridentata* Association	*Psorothamnus schottii* Mapping Unit	---	--- (4231)	Invalid Association, defaulted to Alliance
Psorothamnus schottii Provisional Alliance	*Psorothamnus schottii--Ambrosia salsola--Salvia greatae* Association	*Psorothamnus schottii* Mapping Unit	---	--- (4231)	Invalid Association, defaulted to Alliance. Provisional type valid
Psorothamnus schottii Provisional Alliance	---	*Psorothamnus schottii* Mapping Unit	---	--- (4231)	OK
Psorothamnus spinosus Woodland Alliance	---	*Chilopsis linearis – Psorothamnus spinosus* Alliance	---	61.555.00 (7222)	Corrected to MCV name
Salvia greatae Provisional Alliance	---	*Salvia greatae* Mapping Unit	---	--- (4123)	Invalid Alliance, corrected to Special Stand
Washingtonia filifera Woodland Alliance	---	*Washingtonia filifera* Woodland Alliance	---	61.520.00 (1415)	OK

2015 Alliance/Mapping Unit	2015 Association	2026 Alliance/Mapping Unit	2026 Association	CA Code (Map Code)	Note/Discussion
Xylorhiza cognata Provisional Alliance	---	*Xylorhiza cognata* Mapping Unit	---	--- (9004)	Invalid Alliance, corrected to Special Stand
Yucca schidigera Shrubland Alliance	---	*Yucca schidigera* Shrubland Alliance	---	33.070.00 (5424)	OK
Yucca schidigera Shrubland Alliance	*Yucca schidigera*-- *Larrea tridentata*-- *Ambrosia dumosa* Association	*Yucca schidigera* Shrubland Alliance	*Yucca schidigera* – *Larrea tridentata* – *Ambrosia* dumosa Association	33.070.05 (54241)	OK