

# Vegetation Mapping Report for the San Bernardino Valley Water Conservation District

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Prepared by  
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Prepared for



San Bernardino Valley  
Water Conservation District

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## List of Acronyms

GIS	geographic information system
MCV	A Manual of California Vegetation
MMU	minimum mapping unit
SBVWCD	San Bernardino Valley Water Conservation District

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# 1. Introduction

This report presents the methods, results, and a discussion of a vegetation mapping effort for lands owned and/or managed by the San Bernardino Valley Water Conservation District (District) in the Upper Santa Ana River Wash conducted in 2022. District lands occupy approximately 2,200-acres near Mentone, in San Bernardino, California (Figure 1); approximately 1,500-acres lie within the Preserve set aside for the Upper Santa Ana River Wash Habitat Conservation Plan. Vegetation maps provide insight into many aspects of natural resource management by providing a temporal and geospatial representation of habitat characteristics, such as species distribution, patch size, diversity, seral development, etc., and vegetation communities are commonly used surrogates when defining faunal habitats. Vegetation mapping is conducted periodically by the District to inform various environmental and species management initiatives.

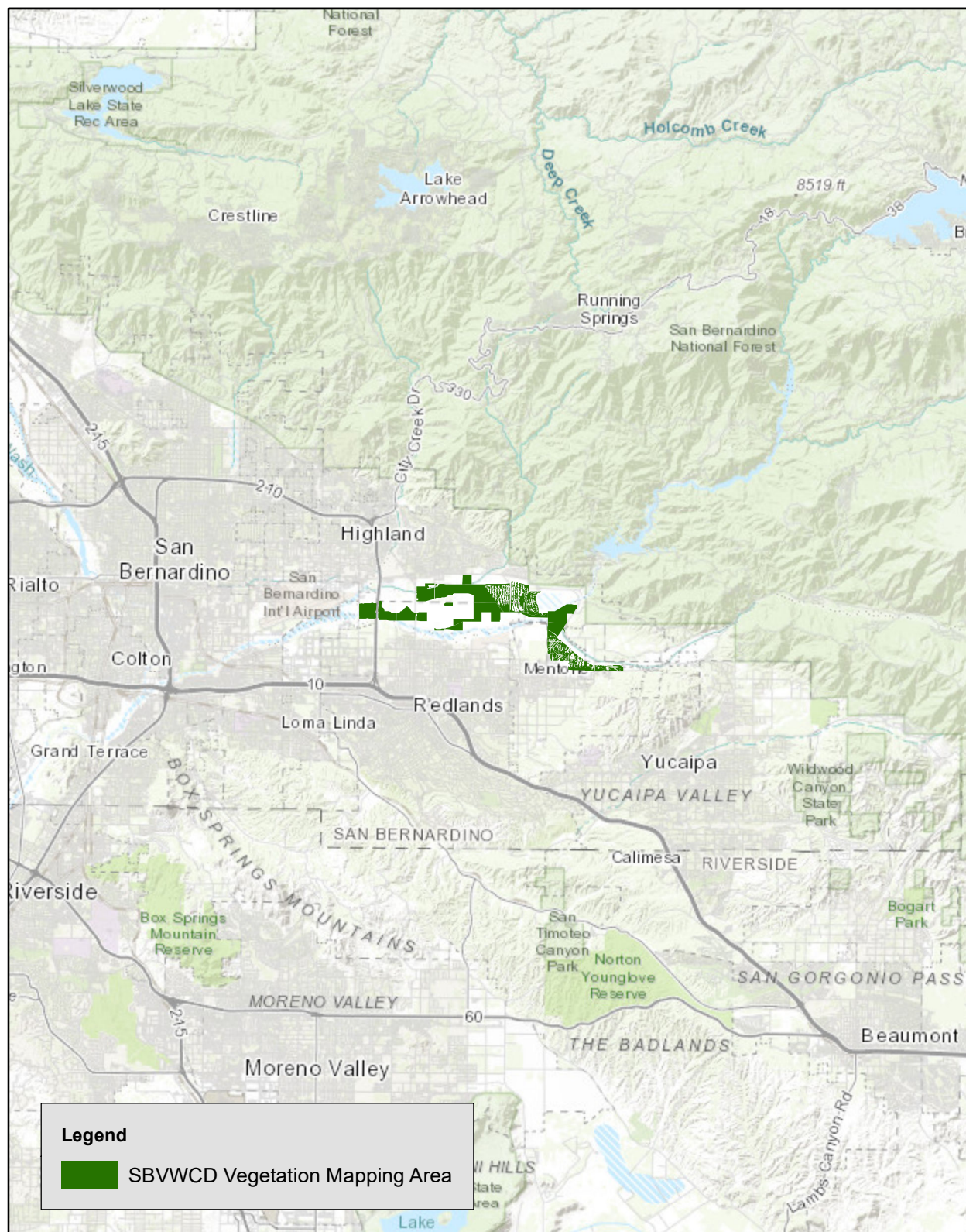
# 2. Methods

For the purpose of this mapping effort, AECOM prepared an association level vegetation classification consistent with the Manual of California Vegetation (MCV) (CNPS 2018). This classification is described in detail under separate cover (AECOM 2022).

Prior to mapping efforts, AECOM subcontracted with GeoTerra Inc. to verify ground control points by field survey and collect four-band (RGB color with color near infrared) aerial imagery. The ground control survey was conducted by a California licensed surveyor prior to flights, and aerial imagery was collected by GeoTerra, Inc. on May 4, 2022. All image acquisition, processing, and ortho-rectification were conducted by GeoTerra, Inc. Final orthophotos were delivered with a resolution of 0.5 foot. This set of images served as the visual layer for photo-interpretation.

Beginning with a base layer provided by the District, vegetation features (e.g., polygons representing vegetation stands) were “cut” from the base layer and attributed to a vegetation association through a combination of photo-interpretation and field reconnaissance. Polygons were drawn using a minimum mapping unit (MMU) of 0.5 acre, and vegetation attributes assigned using the vegetation key provided in the classification described above. Vegetation types were assigned to the alliance level wherever discernable. Unpaved roads were delineated for all road features wider than 10 feet. Field reconnaissance was conducted by the photo-interpreter during the earliest stages of mapping to establish photo-signature recognition for each alliance and association. In the ArcGIS environment, aerial imagery was toggled between true color and color-infrared (CIR) modes to assist differentiation of cover types.

Following the completion of polygon creation and vegetation name attribution, quality control steps, including topological analysis, were completed to identify any gaps or overlaps.



0 1.75 3.5 7 Miles

**Figure 1**  
**Regional Location of Vegetation Mapping Area**

### 3. Results

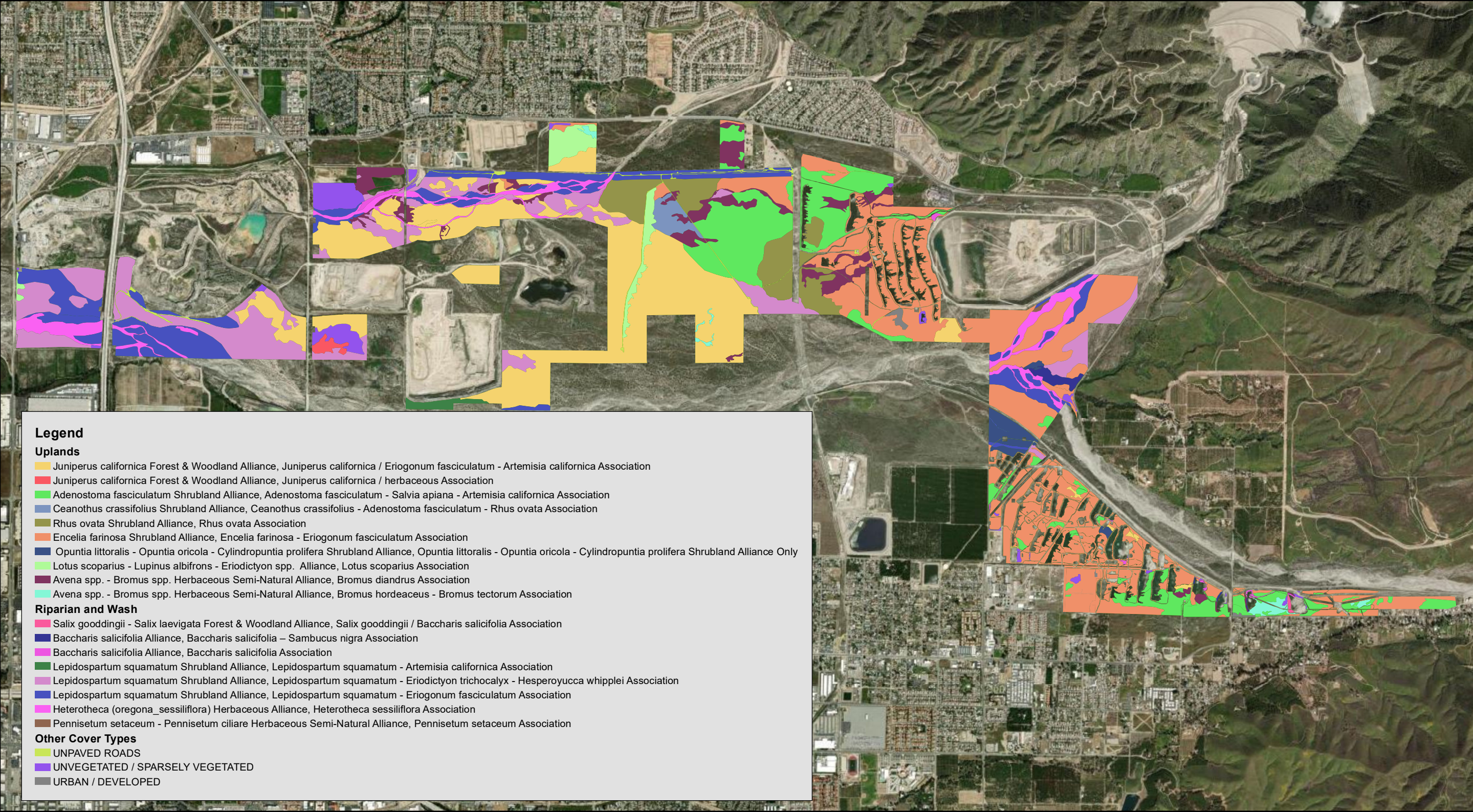
The results of the vegetation mapping effort are presented at a scale of 1:32,000 (1" ≈ 2,667') in Figure 2. The large number of vegetation categories makes symbolization of the map difficult to discern at full scale. Users needing greater detail are directed to the GIS feature data. A tabular summary of the acreage for each vegetation association and other cover type is presented in Table 1. Vegetation types represented in Table 1 have been segregated into two groups: upland vegetation, and riparian and wash vegetation. A third group of "Other Cover Types" is largely composed of unvegetated areas (unpaved roads, graded areas, etc.) with the exceptions of a historically developed farm labor camp which supports a small grove of *Schinus molle* (Peruvian pepper tree) and an area of dumping adjacent a residence on Garnet Street. These two features have been attributed as Urban/Developed.

**Table 1 Acreages of SBVWCD Vegetation and Other Cover Types**

<b>Uplands</b>	
<b><i>Juniperus californica</i> Forest &amp; Woodland Alliance</b>	
<i>Juniperus californica</i> / <i>Eriogonum fasciculatum</i> - <i>Artemisia californica</i> Association	460.7
<i>Juniperus californica</i> / herbaceous Association	6.2
<b><i>Adenostoma fasciculatum</i> Shrubland Alliance</b>	
<i>Adenostoma fasciculatum</i> - <i>Salvia apiana</i> - <i>Artemisia californica</i> Association	236.8
<b><i>Ceanothus crassifolius</i> Shrubland Alliance</b>	
<i>Ceanothus crassifolius</i> - <i>Adenostoma fasciculatum</i> - <i>Rhus ovata</i> Association	17.5
<b><i>Rhus ovata</i> Shrubland Alliance</b>	
<i>Rhus ovata</i> Association	107.4
<b><i>Encelia farinosa</i> Shrubland Alliance</b>	
<i>Encelia farinosa</i> - <i>Eriogonum fasciculatum</i> Association	540.3
<b><i>Lotus scoparius</i> - <i>Lupinus albifrons</i> - <i>Eriodictyon</i> spp. Alliance</b>	
<i>Lotus scoparius</i> Association	38.3
<b><i>Opuntia littoralis</i> - <i>Opuntia oricola</i> - <i>Cylindropuntia prolifera</i> Shrubland Alliance</b>	
<i>Opuntia littoralis</i> - <i>Opuntia oricola</i> - <i>Cylindropuntia prolifera</i> Shrubland Alliance Only	23.9
<b><i>Avena</i> spp. - <i>Bromus</i> spp. Herbaceous Semi-Natural Alliance</b>	
<i>Bromus diandrus</i> Association	89.8
<i>Bromus hordeaceus</i> - <i>Bromus tectorum</i> Association	11.6
<b><i>Pennisetum setaceum</i> - <i>Pennisetum ciliare</i> Herbaceous Semi-Natural Alliance</b>	
<i>Pennisetum setaceum</i> Association	0.9
<b>Uplands Subtotal</b>	<b>1,533.4</b>
<b>Riparian and Wash</b>	
<b><i>Salix gooddingii</i> - <i>Salix laevigata</i> Forest &amp; Woodland Alliance</b>	
<i>Salix gooddingii</i> / <i>Baccharis salicifolia</i> Association	0.9
<b><i>Baccharis salicifolia</i> Alliance</b>	
<i>Baccharis salicifolia</i> – <i>Sambucus nigra</i> Association	8.9
<i>Baccharis salicifolia</i> Association	4.9
<b><i>Lepidospartum squamatum</i> Shrubland Alliance</b>	
<i>Lepidospartum squamatum</i> - <i>Artemisia californica</i> Association	8.8
<i>Lepidospartum squamatum</i> - <i>Eriodictyon trichocalyx</i> - <i>Hesperoyucca whipplei</i> Association	257.7

<i>Lepidospartum squamatum</i> - <i>Eriogonum fasciculatum</i> Association	204.2
<b><i>Heterotheca (oregona, sessiliflora)</i> Herbaceous Alliance</b>	
<i>Heterotheca sessiliflora</i> Association	87.0
<b>Riparian and Wash Subtotal</b>	<b>572.4</b>
<b>Other Cover Types</b>	
<b>Other Cover Types</b>	
UNPAVED ROADS	12.4
UNVEGETATED / SPARSELY VEGETATED	45.0
URBAN / DEVELOPED	4.3
<b>Other Cover Types Subtotal</b>	<b>61.7</b>
<b>Total</b>	<b>2,167.4</b>





**Figure 2**  
**Vegetation Associations and Other Cover Types**





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## 4. Discussion

The degree and extent of current and historic anthropogenic disturbance combined with the frequency of natural change caused by frequent flooding and other factors make mapping natural vegetation in the Upper Santa Ana River a challenging endeavor. Large landform alternations including the creation of recharge basins have disturbed the pre-existing vegetation and changed local hydrology. During field reconnaissance visits it was not uncommon to observe a stand of vegetation that overwhelmingly supported scrub species typical of the *Encelia farinosa* - *Eriogonum fasciculatum* Association that also supported scattered individuals of typically riparian scrub taxa, such as *Baccharis salicifolia* (mulefat) or *Lepidospartum squamatum* (scale-broom), or chaparral species such as *Adenostoma fasciculatum* (chamise). In such cases, vegetation assignment was made based on the dominant vegetation cover and application of the minimum mapping unit.

Prior mapping efforts in the wash have used broader major plant groupings or successional group classifications (Hanes 1984, ICF 2020), and as one of these authors noted, methods of splitting vegetation into numerous small associations versus broader ecological groupings come in and out of vogue (Hanes 1984). This current mapping effort applied MCV classifications and methods in current use by the National Park Service (TNC 1994). An additional option that the District may wish to consider is raster (or vectorized raster) mapping. While lacking the aesthetic appeal of vector (polygon) mapping, a raster based approach would allow for both a finer degree of data resolution far below what is practical for a vector map. Raster layers could be maintained for various environmental variables (vegetation association, canopy height, bare ground, weediness, etc.) and applied directly in modeling efforts, or combined into a single vectorized raster for simple query-based analysis.

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## 5. References

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