



# **Field Key to the Vegetation Alliances of Lake Mead National Recreation Area, Death Valley National Park, Mojave National Preserve, and Castle Mountains National Monument**

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# Key to Vegetation Types

## Key to Physiognomic/Ecological Levels (First Level Key)

**1a.** Stands occur on natural landforms. Vegetation may or may not be present. **(2)**

**1b.** Not as above. Sites characterized by planted stands of vegetation, built-up sites, and/or other anthropogenic features.

### Go to Key VI. Urban and Other Anthropogenic Features

**2a.** Stands occupying arroyos, canyon bottoms, washes, alluvial terraces, stream banks, drainages, springs, seeps, wet meadows, wet flats, playas, or other places that receive runoff and/or retain moisture such as through a high water table, but that may dry out later in the year.

### Go to Key I. Riparian, Semi-riparian, Wash, Seep, Playa, Lacustrine, and Ground-water Dependent Vegetation

**2b.** Stands not as above, occupying upland mountains, hills, bajadas (alluvial fans), and other settings. Although non-native species may be present, they are distributed naturally across the site, not planted in discrete stands. **(3)**

**3a.** Canopy cover of tree species is at least 3% absolute cover, though in cases with *Pinus monophylla*, *Yucca brevifolia* or wash woodlands, canopy cover is at least 2% cover and trees are well-distributed throughout the stand.

### Go to Key II. Forest and Woodland Vegetation

**3b.** Trees not characteristically present in the overstory, and constitute <2–3% absolute canopy cover; the shrubs and/or herbs define the stands. **(4)**

**4a.** Shrub species, regardless of height, comprise at least 2% absolute cover, and herbaceous cover is variable.

### Go to Key III. Shrubland Vegetation

**4b.** Trees and shrubs less than 2% cover. Herbaceous cover is variable. **(5)**

**5a.** Herbaceous species comprise more than 2% absolute cover, and tree and/or shrub cover is <2%.

### Go to Key IV. Herbaceous Vegetation

**5b.** Cover of vascular plant species is <2% absolute cover on average, though non-vascular species can be present and high in cover. Areas include desert pavement, sand dunes/flats, rock outcrops, gypsum hills, and other areas with sparse or no vascular plant cover. (If sparsely vegetated along streams, drainages, playas or other similar settings, see Key I.)

### Go to Key V. Sparsely Vegetated and Unvegetated Areas

## **Key I. Riparian, Semi-riparian, Wash, Seep, Playa, Lacustrine, and Ground-water Dependent Vegetation**

Stands developed along streams, floodplains, washes, seeps, springs, montane drainage channels, other riparian or wetland sites that depend upon surface water, playas and other features with access to ground-water, including alluvial terraces and basins that are strongly alkaline in nature.

**1a.** Stands with riparian trees and tall shrubs including *Chilopsis linearis*, *Populus fremontii*, *Salix exigua*, *Salix gooddingii*, *Salix laevigata*, *Salix lasiolepis*, *Parkinsonia microphylla*, *Phoenix dactylifera*, *Prosopis glandulosa*, *P. pubescens*, *Psoralea argophylla*, *Quercus chrysolepis*, *Quercus turbinella*, *Tamarix* spp., or *Washingtonia filifera* at >2% cover **(2)**

**1b.** Stands not as above. Stands dominated by other shrubs, herbs, sparse, or no vegetation. **(15)**

**2a.** Stands dominated by *Acer glabrum*, *Populus fremontii*, *Salix exigua*, *Salix gooddingii*, *Salix laevigata*, *Salix lasiolepis*, or a non-native palm such as *Phoenix dactylifera* or *Washingtonia filifera* in the overstory. **(3)**

**2b.** Stands with other low trees and shrubs present including *Chilopsis linearis*, *Psoralea argophylla*, *Parkinsonia microphylla*, *Prosopis glandulosa*, *P. pubescens*, *Quercus chrysolepis*, *Quercus turbinella*, or *Tamarix* spp. **(9)**

**3a.** Stands dominated or co-dominated by *Populus fremontii* in seeps and riparian areas in mountains to valleys.

### **G797. Western Interior Riparian Forest & Woodland Group**

#### ***Populus fremontii* - *Fraxinus velutina* - *Salix gooddingii* Flooded Forest & Woodland Alliance (A3803)**

*Populus fremontii* / *Baccharis (emoryi, salicina)* Association

*Populus fremontii* / *Baccharis sergiloides* Association

*Populus fremontii*-*Salix gooddingii* Association

*Populus fremontii*-*Salix laevigata* Association

*Populus fremontii* / *Salix exigua* Association\*

**3b.** Stand not as above. Other taxa such as *Salix* spp., *Acer glabrum*, or a non-native palm such as *Washingtonia filifera*, present in the overstory **(4)**

**4a.** *Acer glabrum* dominant in stands, along springs and mountain drainages.

### **G305. Central Rocky Mountain-North Pacific High Montane Mesic Shrubland Group**

#### ***Abies lasiocarpa* - *Populus tremuloides* / *Acer glabrum* Central Rocky Mountain Avalanche Chute Shrubland Alliance (A3968)**

*Acer glabrum* drainage bottom Association

**4b.** Stand not as above. Other shrubs and low trees along streams, seeps, springs, and groundwater dependent sites. **(5)**

**5a.** *Salix exigua* or *Salix lasiolepis* dominant as shrub willows in stands, along streams, springs, and seeps. (6)

**G526. Rocky Mountain & Great Basin Lowland & Foothill Riparian Shrubland, G527. Western Montane-Subalpine Riparian & Seep Shrubland, and G533. North American Warm Desert Riparian Low Bosque & Shrubland Groups**

**5b.** Stands not as above, riparian trees dominant in stands. *Salix gooddingii*, *Salix laevigata* and/or a non-native palm such as *Washingtonia filifera* dominant in stands. May include other trees, shrubs, herbs, or sparse vegetation. (7)

**6a.** *Salix exigua* dominant or co-dominant in stands.

***Salix exigua* Warm Desert Riparian Shrubland Alliance (A0947)**

*Salix exigua* Barren Association

*Salix exigua*–*Baccharis sergiloides* Association

*Salix exigua* / Mesic graminoids Association

**6b.** *Salix lasiolepis* dominant, along seeps and streams; understory plants are variable.

***Salix lasiolepis* Warm Desert Riparian Shrubland Alliance (A3878)**

*Salix lasiolepis* / Barren Ground Association

*Salix lasiolepis* / *Rosa woodsii* / Mixed Herbs Association

**7a.** The non-native palm *Phoenix dactylifera* and/or ruderal *Washingtonia filifera* is dominant in the overstory (or co-dominant together or with other non-native trees) along springs and streams, as introduced and naturalizing species in the Mojave Desert. In other areas of southern California, non-native palms (*Phoenix canariensis* or *Washingtonia robusta*) can also be dominant for this alliance.

**G510. Interior West Ruderal Riparian Forest & Scrub Group**

***Phoenix dactylifera* - *Washingtonia filifera* Ruderal Woodland Alliance (A4161)**

*Washingtonia filifera* / Spring Ruderal Woodland Association

*Phoenix dactylifera* Ruderal Woodland Association

**7b.** Stands not as above. Other willows dominant in the overstory, along streams and springs. (8)

**G797. Western Interior Riparian Forest & Woodland Group**

**8a.** *Salix gooddingii* dominant or co-dominant with other trees such as willows, along seeps, springs and streams.

***Salix gooddingii* - *Salix laevigata* Riparian Forest Alliance (A3752)**

*Salix gooddingii* Association

**8b.** *Salix laevigata* dominant, along seeps and streams; understory plants are variable.

***Salix gooddingii* - *Salix laevigata* Riparian Forest Alliance (A3752)**

*Salix laevigata* Association

**9a.** *Tamarix* spp. overwhelmingly dominant (>80% relative cover) as a non-native invasive species, occurring along desert washes, drainage channels, and lake shoreline and draw-down zone of Lake Mead. (If *Tamarix aphylla* dominant, see Key VI. Urban and Other Anthropogenic Features).

**G510. Interior West Ruderal Riparian Forest & Scrub Group**

***Tamarix* spp. Ruderal Riparian Scrub Alliance (A0842)**

*Tamarix* spp. Temporarily Flooded Ruderal Association

**9b.** Native vegetation present and dominant or characteristically present. (10)

**10a.** *Prosopis* spp. dominant in the overstory, along seeps, springs, reservoir shorelines, and coppice dunes where groundwater is high and available for plants. (11)

**G533. North American Warm Desert Riparian Low Bosque & Shrubland Group**

**10b.** Other plants dominant, and occur in various settings. (12)

**11a.** *Prosopis pubescens* dominant or co-dominant as a tree (or tall shrub) with other plants such as *Prosopis glandulosa*, *Salix* spp., or *Tamarix* spp. Shrubs and vines may be present and variable in cover, including *Baccharis sergiloides*, *Pluchea sericea*, and *Vitis arizonica*.

***Prosopis glandulosa* - *Prosopis velutina* - *Prosopis pubescens* Riparian Forest, Woodland & Shrubland Alliance (A3877)**

*Prosopis pubescens* / *Baccharis sergiloides* Association

*Prosopis pubescens* / *Pluchea sericea* Association

**11b.** *Prosopis glandulosa* dominant or co-dominant with other trees or tall shrubs such as *Salix* spp. and *Tamarix* spp. Shrubs may be present and variable in cover, including *Atriplex* spp., *Baccharis sergiloides*, *Pluchea sericea*, and *Suaeda moquinii*.

***Prosopis glandulosa* - *Prosopis velutina* - *Prosopis pubescens* Riparian Forest, Woodland & Shrubland Alliance (A3877)**

*Prosopis glandulosa* var. *torreyana* Association

*Prosopis glandulosa* / (*Atriplex* spp.–*Suaeda moquinii*) Association

*Prosopis glandulosa* / *Sporobolus airoides* Association

*Prosopis glandulosa*–(*Salix exigua*–*Salix lasiolepis*) Association

*Prosopis glandulosa*–*Tamarix ramosissima* Association

**12a.** *Chilopsis linearis* or *Psoralea argophylla* dominant or co-dominant together in stands, along washes, floodplains, and lower drainages of mountains. (13)

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

**12b.** Not as above. Stand along canyon channels and lower drainages of mountains dominated by *Quercus chrysolepis* or *Quercus turbinella*. (14)

**13a.** *Chilopsis linearis* dominant, with variable shrub cover, along washes and floodplains.

***Chilopsis linearis* - *Psoralea argophylla* Desert Wash Scrub Alliance (A1044)**

*Chilopsis linearis* Association

*Chilopsis linearis* / (*Ambrosia eriocentra*–*Salvia dorrii*) Association

*Chilopsis linearis* / *Ericameria paniculata* Association

*Chilopsis linearis* / *Hymenoclea salsola* Association

*Chilopsis linearis* / *Prunus fasciculata* Association

**13b.** *Psorothamnus spinosus* dominant, with variable shrub cover, along washes and floodplains.

***Chilopsis linearis* - *Psorothamnus spinosus* Desert Wash Scrub Alliance (A1044)**

*Psorothamnus spinosus* Association\*

*Psorothamnus spinosus* / *Acacia greggii*–(*Hyptis emoryi*) Association

*Psorothamnus spinosus* / *Hymenoclea salsola*–(*Bebbia juncea*–*Ephedra californica*) Association

**14a.** Stand dominated by *Quercus chrysolepis*.

**G195. Californian Broadleaf Forest and Woodland Group**

***Quercus chrysolepis* - *Quercus kelloggii* Forest & Woodland Alliance (A3349)**

*Quercus chrysolepis* / *Rhamnus ilicifolia* Association

**14b.** Stand dominated by *Quercus turbinella*.

**G281. Western Madrean Chaparral Group**

***Quercus turbinella* Chaparral Alliance (A0793)**

*Quercus turbinella*–(*Chilopsis linearis*, *Prunus fasciculata*) Wash Association\*

*Quercus turbinella*–*Baccharis sergiloides* Association

*Quercus turbinella*–*Juniperus californica*–*Eriogonum* spp. Association

**15a.** Stands with other shrubs and low trees present at  $\geq 2\%$  cover. Herbs variable and trees, if present, are few and are scattered. **(16)**

**15b.** Stands not as above. Shrubs and trees absent or sparse at  $< 2\%$  in cover, and herbs present (at variable cover) or absent. **(58)**

**16a.** Shrubs including *Acacia greggii* (= *Senegalia greggii*), *Artemisia tridentata* ssp. *vaseyana*, *Baccharis* spp., *Celtis laevigata* var. *reticulata*, *Chrysothamnus viscidiflorus*, *Ericameria* spp., *Encelia farinosa*, *Fallugia paradoxa*, *Forestiera pubescens*, *Hymenoclea salsola* (= *Ambrosia salsola*), *Lepidospartum latisquamum*, *Lycium* spp., *Larrea tridentata*, *Pluchea sericea*, *Viguiera* spp., and *Vitis* spp. in canyons, washes, or playas on rock, mixed sediments, or clays with permanent to intermittent flooding. **(17)**

**16b.** Shrubs including *Allenrolfea occidentalis*, *Atriplex* spp., *Chrysothamnus albidus*, *Grayia spinosa*, *Kraschennikovia lanata*, *Suaeda moquinii*, and *Sarcobatus vermiculatus* in alkaline seeps, springs, playas, valley floors and dunes with groundwater available to plants, and other similar sites. **(47)**

**17a.** Stands with *Artemisia tridentata*, *Chrysothamnus viscidiflorus*, *Ericameria nauseosa*, or *Lepidospartum latisquamum* dominant or co-dominant in stands, along mountain drainage channels, seeps and springs, and disturbed areas with more ambient moisture. **(18)**

**17b.** Plants not as above. **(20)**

**18a.** *Artemisia tridentata* var. *vaseyana* dominant in stands in montane drainage channels and valley floors with drainages.

***Artemisia tridentata* ssp. *vaseyana* – Mixed Shrubland Alliance (A3208)**

*Artemisia tridentata* ssp. *vaseyana* Association

**18b.** Other plants dominant or co-dominant in stands in montane drainage channels, springs and seeps, etc. **(19)**

**19a.** *Chrysothamnus viscidiflorus* dominant in stands.

**G310. Intermountain Semi-Desert Steppe & Shrubland Group**  
***Chrysothamnus viscidiflorus* Shrubland and Shrub Herbaceous Alliance (A3195)**  
*Chrysothamnus viscidiflorus* Shrub Herbaceous Association

**19b.** *Ericameria nauseosa* or *Lepidospartum latisquamatum* dominant or co-dominant in stands.

**G559. Cool Semi-Desert Shrub & Herb Wash-Arroyo Group**  
***Ericameria nauseosa* Steppe & Shrubland Alliance (A3196)**  
*Ericameria nauseosa* Desert Wash Association  
*Lepidospartum latisquamum* Desert Wash Association

**20a.** Stands characterized by thickets of *Rosa woodsii*.

**G527. Western Montane-Subalpine Riparian & Seep Shrubland Group**  
***Cornus sericea* - *Dasiphora fruticosa* ssp. *floribunda* - *Ribes* spp.**  
**Wet Shrubland Alliance (A3773)**  
*Rosa woodsii* Association

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

**21a.** *Baccharis* spp., *Fallugia paradoxa*, *Forestiera pubescens*, *Pluchea sericea*, and/or *Vitis arizonica* co-dominant to dominant in stands. **(22)**

**21b.** *Acacia greggii* (= *Senegalia greggii*), *Ambrosia dumosa*, *Bebbia juncea*, *Celtis laevigata* var. *reticulata*, *Encelia farinosa*, *Ericameria paniculata*, *Eriogonum fasciculatum*, *Hyptis emoryi*, *Hymenoclea salsola* (= *Ambrosia salsola*), *Prunus fasciculata*, *Lycium* spp., *Viguiera* spp., and/or *Larrea tridentata* co-dominant to dominant in stands. **(27)**

**22a.** *Fallugia paradoxa*, *Forestiera pubescens*, or *Rhus trilobata* dominant or co-dominant with other shrubs in stands, along canyon drainages, mountain springs, and arroyos. **(23)**

**22b.** *Baccharis sergiloides*, *Baccharis emoryi*, *Celtis laevigata* var. *reticulata*, *Pluchea sericea*, and/or *Vitis* spp. dominant or co-dominant with shrubs in stands, along canyon drainages, mountain ravines and seeps, arroyos, streams, washes, playas, and other riparian settings. **(24)**

**23a.** *Fallugia paradoxa* dominant or co-dominant with other shrubs such as *Garrya flavescens*, *Prunus fasciculata*, or *Ephedra* spp., in canyon drainages, arroyos, and washes.

**G541. Warm Semi-Desert Shrub & Herb Dry Wash & Colluvial Slope Group**  
***Fallugia paradoxa* Desert Wash Shrubland Alliance (A3259)**  
*Fallugia paradoxa* Desert Wash Shrubland

**23b.** *Forestiera pubescens* dominant or co-dominant with other shrubs such as *Baccharis sergiloides*, *Prunus fasciculata*, *Rhus trilobata*, and *Salix exigua*, in canyon drainages and mountain springs. Or sometimes *Rhus trilobata* may be dominant.

**G526. Rocky Mountain & Great Basin Lowland & Foothill Riparian Shrubland and**  
**G533. North American Warm Desert Riparian Low Bosque & Shrubland Group**  
***Rhus trilobata* - *Crataegus rivularis* - *Forestiera pubescens* Shrubland Alliance (A3799)**  
*Forestiera pubescens* Wet Association

**24a.** *Baccharis sergiloides* or *Baccharis emoryi* dominant or co-dominant with other shrubs including *Acacia greggii* (= *Senegalia greggii*), *Prunus fasciculata*, *Rhus trilobata*, *Atriplex polycarpa*, and *Vitis arizonica*, along canyon drainages, mountain seeps, and such.

**G533. North American Warm Desert Riparian Low Bosque & Shrubland Group**  
***Baccharis emoryi* - *Baccharis sergiloides* Wet Shrubland Alliance (A3874)**

*Baccharis sergiloides* Association

*Baccharis sergiloides* / *Muhlenbergia rigens* Association

*Baccharis sergiloides* / *Typha domingensis* Association (Provisional)

*Baccharis sergiloides*–*Prunus fasciculata*–*Rhus trilobata* Association

**24b.** *Pluchea sericea*, *Celtis laevigata* var. *reticulata*, *Vitis arizonica*, or *V. girdiana* dominant or co-dominant in stands. **(25)**

**25a.** *Pluchea sericea* dominant or co-dominant with species such as *Allenrolfea occidentalis*, *Baccharis emoryi*, *Baccharis sergiloides*, *Suaeda moquinii*, or *Tamarix* spp. Herbs may be present with variable cover including *Anemopsis californica*, *Andropogon glomeratus*, *Distichlis spicata*, *Juncus* spp., *Phragmites australis*, and *Sporobolus airoides*.

**G537. North American Desert Alkaline-Saline Wet Scrub Group**  
***Pluchea sericea* Wet Shrubland Alliance (A0798)**

*Pluchea sericea* Seasonally Flooded Association

*Pluchea sericea* / *Phragmites australis* Association

**25b.** *Celtis laevigata* var. *reticulata* or *Vitis* spp. dominant in stands. **(26)**

**26a.** *Celtis laevigata* var. *reticulata* dominant in the tall shrub layer; other shrubs including *Baccharis sergiloides* and *Rhus trilobata* may also be present and subdominant.

**G533. North American Warm Desert Riparian Low Bosque & Shrubland Group**  
***Celtis laevigata* - *Rhus trilobata* Wet Shrubland Alliance (A1033)**

(no association defined)

**26b.** *Vitis arizonica* or *Vitis girdiana* dominant in the shrub layer; other shrubs including *Acacia greggii* (= *Senegalia greggii*), *Baccharis sergiloides* and *Salix exigua* may be present and subdominant to co-dominant. Herbs such as *Arundo donax*, *Cladium californicum*, *Phragmites australis*, and *Distichlis spicata* may be present and dominant or co-dominant along with a variety of other herbs.

**G533. North American Warm Desert Riparian Low Bosque & Shrubland Group**  
***Vitis arizonica* - *Vitis girdiana* Shrubland Alliance (A4162)**

*Vitis girdiana* Association (Provisional)

*Vitis arizonica* Association (Provisional)

*Vitis arizonica* / *Cladium californicum* Association (Provisional)

**27a.** *Acacia greggii* (= *Senegalia greggii*), *Bebbia juncea*, *Ephedra californica*, *Encelia actonii*, *Encelia virginensis*, *Hymenoclea salsola* (= *Ambrosia salsola*), *Hyptis emoryi*, *Prunus fasciculata*, *Ericameria paniculata*, *Salazaria mexicana*, *Salvia dorrii*, *Senna armata*, or *Viguiera reticulata* dominant or co-dominant in stands. (28)

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

**27b.** *Eriogonum fasciculatum*, *Viguiera parishii*, *Ambrosia dumosa*, *Encelia farinosa*, *Lycium* spp., *Larrea tridentata*, *Psoralea fremontii*, or *Parkinsonia microphylla* dominant or co-dominant with shrubs. (38)

**28a.** *Prunus fasciculata*, *Prunus eremophila*, or *Acacia greggii* (= *Senegalia greggii*) dominant or co-dominant in stands. (29)

**28b.** Other plants dominant in stands. (30)

**29a.** *Prunus fasciculata* or *Prunus eremophila* dominant in stands or co-dominant with other species including *Brickellia desertorum*, *Rhus trilobata* or *Ericameria* spp. Occurs in upper washes, mountain canyons, and rocky slopes.

***Prunus fasciculata* - *Salazaria mexicana* Northern Mojave Desert Wash Alliance (A4185)**

*Prunus eremophila* Association

*Prunus fasciculata* Association

*Prunus fasciculata*–*Ambrosia eriocentra* Association

*Prunus fasciculata*–(*Purshia stansburiana*–*Viguiera reticulata*) Association

*Prunus fasciculata*–*Rhus trilobata* Association

**29b.** *Acacia greggii* (= *Senegalia greggii*)  $\geq$  2% cover, not exceeded by any other species of microphyllous tall shrub or tree. Smaller shrubs, such as *Hymenoclea salsola* and *Bebbia juncea*, can have higher cover but no more than twice the cover of *A. greggii*. Occurs in washes and arroyos, as well as upland valleys and bouldery slopes.

***Acacia greggii* - *Hyptis emoryi* - *Justicia californica* Desert Wash Shrubland Alliance (A4187)**

*Acacia greggii* Wash Association

*Acacia greggii*–(*Ambrosia eriocentra*–*Salvia dorrii*) Association

*Acacia greggii*–*Eriogonum fasciculatum* Association

*Acacia greggii*–*Larrea tridentata*–*Hymenoclea salsola* Association

*Acacia greggii*–*Prunus fasciculata* Association

*Acacia greggii*–*Viguiera parishii* Association

**30a.** *Hyptis emoryi* dominant or co-dominant with shrubs such as *Bebbia juncea*, along arroyos and upper washes.

***Acacia greggii* - *Hyptis emoryi* - *Justicia californica* Desert Wash Shrubland Alliance (A4187)**

*Hyptis emoryi* Association

**30b.** *Bebbia juncea*, *Ephedra californica*, *Encelia actonii*, *Encelia virginensis*, *Ericameria paniculata*, *Hymenoclea salsola* (= *Ambrosia salsola*), *Salazaria mexicana*, *Salvia dorrii*, *Senna armata*, or *Viguiera reticulata* dominant or co-dominant in stands, along arroyos and washes. (31)

**31a.** *Ericameria paniculata* is dominant in stands, or sometimes co-dominant with shrubs such as *Hymenoclea salsola* (= *Ambrosia salsola*) or *Larrea tridentata*.

***Ericameria paniculata* Mojave Desert Wash Shrubland Alliance (A2509)**

*Ericameria paniculata* Wash Association

*Ericameria paniculata*–*Hymenoclea salsola* Association

**31b.** Other shrubs dominant in stands. **(32)**

**32a.** *Salazaria mexicana* or *Salvia dorrii* dominant or co-dominant in stands. **(33)**

**32b.** *Ephedra californica*, *Encelia actonii*, *Encelia virginensis*, *Viguiera reticulata*, *Hymenoclea salsola* (= *Ambrosia salsola*), *Bebbia juncea*, or *Senna armata* dominant in stands. **(34)**

**33a.** *Salazaria mexicana* dominant or co-dominant in stands with shrubs such as *Hymenoclea salsola* or *Prunus fasciculata*.

***Prunus fasciculata* - *Salazaria mexicana* Northern Mojave Desert Wash Alliance (A4185)**

*Salazaria mexicana* Association

*Hymenoclea salsola* - *Salazaria mexicana* Association

**33b.** *Salvia dorrii* dominant or co-dominant with other shrubs such as *Prunus fasciculata* or *Salazaria mexicana* in stands.

***Prunus fasciculata* - *Salazaria mexicana* Northern Mojave Desert Wash Alliance (A4185)**

*Salvia dorrii* Association

**34a.** *Encelia actonii*, *Encelia virgensis*, or *Vigueira reticulata* dominant or co-dominant in stands. **(35)**

**34b.** Other plants dominant in stands. **(36)**

**35a.** *Encelia actonii* or *Encelia virginensis* dominant or co-dominant with shrubs such as *Salvia dorrii* in stands.

***Encelia actonii* - *Encelia virginensis* - *Viguiera reticulata* Shrubland Alliance (A4163)**

*Encelia actonii* Association

*Encelia virginensis* Association

*Encelia virginensis*–*Salvia dorrii* Association

**35b.** *Viguiera reticulata* dominant or co-dominant in stands with *Encelia* spp., *Salazaria mexicana*, or other shrubs.

***Encelia actonii* - *Encelia virginensis* - *Viguiera reticulata* Shrubland Alliance (A4163)**

*Viguiera reticulata* Association

**36a.** *Ephedra californica* dominant or co-dominant with shrubs such as *Hymenoclea salsola*.

***Ephedra californica* - *Ephedra trifurca* Desert Wash Shrubland Alliance (A2536)**

*Ephedra californica* Association\*

*Ephedra californica*–*Hymenoclea salsola* Association

*Ephedra trifurca* Association

**36b.** *Hymenoclea salsola* (= *Ambrosia salsola*), *Bebbia juncea*, or *Senna armata* dominant in stands. (37)

**37a.** *Hymenoclea salsola* (= *Ambrosia salsola*) is dominant or co-dominant (or sometimes sub-dominant) with other shrubs such as *Ambrosia eriocentra*, *Brickellia incana*, *Eriogonum fasciculatum*, and/or *Larrea tridentata*.

***Hymenoclea salsola* - *Bebbia juncea* Mojave-Sonoran Desert Wash Alliance (A4188)**

*Hymenoclea salsola* Association

*Hymenoclea salsola*–(*Ambrosia eriocentra*–*Brickellia incana*) Association

*Hymenoclea salsola*–*Eriogonum fasciculatum* Association

*Hymenoclea salsola*–*Larrea tridentata* Association

**37b.** *Bebbia juncea*, *Brickellia incana* or *Senna armata* dominant or co-dominant in stands with *Hymenoclea salsola* (= *Ambrosia salsola*), *Encelia farinosa*, or *Larrea tridentata*.

***Hymenoclea salsola* - *Bebbia juncea* Mojave-Sonoran Desert Wash Alliance (A4188)**

*Bebbia juncea* Association

*Brickellia incana* Association\*

*Senna armata*–*Hymenoclea salsola* Wash Association

**38a.** *Peucephyllum schottii*, *Pleurocoronis pluriseta*, *Eriogonum fasciculatum*, *Lycium* spp., or *Viguiera parishii* dominant or co-dominant and usually intermixed with other shrubs including *Ambrosia dumosa*, *Bebbia juncea*, and *Ephedra* spp. in mountain drainages, arroyos and washes. (39)

**38b.** *Ambrosia dumosa*, *Encelia farinosa*, *Larrea tridentata*, *Psoralea fremontii*, or *Parkinsonia microphylla* dominant or co-dominant with other shrubs, typically in washes and arroyos. (41)

**39a.** *Peucephyllum schottii* dominant, co-dominant, or characteristically present in stands with shrubs such as *Eucnide urens*, *Hymenoclea salsola* (= *Ambrosia salsola*), and *Pleurocoronis pluriseta*.

**G569. North American Warm Semi-Desert Cliff, Scree & Pavement Sparse Vegetation Group**

***Peucephyllum schottii* - *Pleurocoronis pluriseta* Scrub Alliance (A3143)**

*Peucephyllum schottii* Association

*Peucephyllum schottii*–*Eucnide urens*–*Pleurocoronis pluriseta* Association

**39b.** Plants in stands not like above. *Lycium* spp., *Eriogonum fasciculatum*, or *Viguiera parishii* dominant or co-dominant in stands. (40)

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**

**40a.** *Lycium andersonii* or *Lycium cooperi* dominant or co-dominant in stands.

***Ephedra nevadensis* - *Lycium andersonii* - *Grayia spinosa* Scrub Alliance (A4245)**

*Lycium andersonii* Association

*Lycium cooperi* Association (provisional)

**40b.** *Eriogonum fasciculatum* or *Viguiera parishii* dominant or co-dominant, and usually intermixed with other shrubs including *Ambrosia dumosa*, *Bebbia juncea*, and *Ephedra* spp.

***Eriogonum fasciculatum* - *Viguiera parishii* Shrubland Alliance (A3150)**

*Eriogonum fasciculatum* (wash) Association  
*Viguiera parishii*–*Eriogonum fasciculatum* Association  
*Viguiera parishii* Association

**41a.** *Parkinsonia microphylla* dominant, usually as scattered trees with variable cover of shrubs intermixed, along washes and north-facing lower-elevation slopes.

**G293. Sonoran Paloverde - Mixed Cacti Desert Scrub Group**

***Carnegiea gigantea* - *Parkinsonia microphylla* - *Prosopis velutina* Desert Scrub Alliance (A3282)**

*Parkinsonia microphylla*–*Larrea tridentata* Association

**41b.** *Ambrosia dumosa*, *Larrea tridentata*, *Encelia farinosa*, *Ephedra* and/or *Psoralea fremontii* dominant in stands. **(42)**

**G295. Mojave-Sonoran Bajada & Valley Desert Scrub Group**

**42a.** *Larrea tridentata* dominant or co-dominant in washes and arroyos. **(43)**

**42b.** Other plants dominant in stands. **(45)**

**43a.** *Larrea tridentata* dominant shrub in stands, or co-dominant with *Atriplex polycarpa*.

***Larrea tridentata* Desert Scrub Alliance (cf. A3278)**

*Larrea tridentata* Association

*Larrea tridentata* / *Pleuraphis rigida* Association

*Larrea tridentata*–*Atriplex polycarpa* Association

**43b.** *Larrea* co-dominant with other shrubs in stands. **(44)**

**44a.** *Larrea* co-dominant with *Ambrosia dumosa* in washes.

***Larrea tridentata* - *Ambrosia dumosa* Bajada & Valley Desert Scrub Alliance (A3277)**

*Larrea tridentata*–*Ambrosia dumosa* Association

*Larrea tridentata*–*Ambrosia dumosa* / *Pleuraphis rigida* Association

*Larrea tridentata*–*Ambrosia dumosa*–*Atriplex hymenelytra* Association

*Larrea tridentata*–*Ambrosia dumosa*–*Hymenoclea salsola* Association

*Larrea tridentata*–*Ambrosia dumosa*–*Krameria (erecta, grayi)* Association

*Larrea tridentata*–*Ambrosia dumosa*–(*Ephedra nevadensis*–*Lycium andersonii*) Association

*Larrea tridentata*–*Ambrosia dumosa*–*Ephedra funerea* Association

*Larrea tridentata*–*Ambrosia dumosa*–*Fouquieria splendens* Association

*Larrea tridentata*–*Ambrosia dumosa*–*Psoralea arborescens* Association

*Larrea tridentata*–*Ambrosia dumosa*–*Psoralea fremontii* Association

*Larrea tridentata*–*Ambrosia dumosa*–*Senna armata* Association

**44b.** *Larrea* co-dominant with *Encelia farinosa* in washes.

***Larrea tridentata* - *Encelia farinosa* - *Fouquieria splendens* Upper Bajada & Rock Outcrop Desert Scrub Alliance (A3278)**

*Larrea tridentata*–*Encelia farinosa* Association

*Larrea tridentata*–*Encelia farinosa*–*Bebbia juncea* Association

*Larrea tridentata*–*Encelia farinosa*–*Pleurocoronis pluriseta* Association

45a. *Psoralea argophylla* or *Psoralea fremontii* dominant or co-dominant with shrubs such as *Ambrosia dumosa* or *Larrea tridentata*.

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

***Psoralea fremontii* - *Psoralea polydenia* Wash Alliance (A4186)**

*Psoralea argophylla* Association

*Psoralea fremontii* Association

*Psoralea fremontii*–*Ambrosia dumosa* Association

45b. *Ambrosia dumosa* or *Encelia farinosa* dominant or co-dominant in stands. (46)

**G295. Mojave-Sonoran Bajada & Valley Desert Scrub Group**

46a. *Encelia farinosa* dominant or co-dominant with *Ambrosia dumosa* in stands.

***Encelia farinosa* Desert Scrub Alliance (A4215)**

*Encelia farinosa* Association

*Encelia farinosa*–*Ambrosia dumosa* Association

46b. *Ambrosia dumosa* dominant or co-dominant in stands with *Ephedra torreyana* or other shrubs.

***Ambrosia dumosa* Desert Dwarf Scrub Alliance (A3279)**

*Ambrosia dumosa* Association

*Ambrosia dumosa*–*Ephedra torreyana* (–*Psoralea fremontii*) Association

47a. *Grayia spinosa* or *Krascheninnikovia lanata* dominant or co-dominant in stands, including along playas and valley floors. (48)

47b. Other plants dominant in stands. (49)

48a. *Grayia spinosa* dominant or co-dominant with other shrubs in stands.

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**

***Ephedra nevadensis* - *Lycium andersonii* - *Grayia spinosa* Scrub Alliance (A4245)**

*Grayia spinosa* Association

*Grayia spinosa*–*Lycium andersonii* Association

*Grayia spinosa*–*Picrothamnus desertorum* Association

48b. *Krascheninnikovia lanata* dominant in stands.

**G310. Intermountain Semi-Desert Steppe & Shrubland Group**

***Krascheninnikovia lanata* Steppe & Dwarf-shrubland Alliance (A3202)**

*Krascheninnikovia lanata* Association

*Krascheninnikovia lanata*–*Gutierrezia* spp. / *Bouteloua eriopoda*–*Pleuraphis rigida* Association\*

49a. *Atriplex canescens*, *Atriplex polycarpa* or *Atriplex confertifolia* dominant or co-dominant in stands. (50)

49b. Other shrubs including other *Atriplex* spp. and *Suaeda moquinii* dominant in stands. (52)

50a. *Atriplex canescens* or *Atriplex polycarpa* dominant or co-dominant in stands, along washes and playas. (51)

**50b.** *Atriplex confertifolia* dominant or co-dominant in stands, along washes and playas.

**G300. Intermountain Shadscale–Saltbush Scrub Group**

***Atriplex confertifolia* Scrub Alliance (A0870)**

*Atriplex confertifolia* Great Basin Association

*Atriplex confertifolia*–*Ambrosia dumosa* Association

*Atriplex confertifolia*–*Atriplex canescens* Association

*Atriplex canescens*–*Ephedra nevadensis* Association

*Atriplex confertifolia*–*Lycium andersonii* Association

*Atriplex confertifolia*–*Suaeda moquinii* Association

**51a.** *Atriplex polycarpa* dominant in stands.

**G300. Intermountain Shadscale–Saltbush Scrub Group**

***Atriplex polycarpa* Shrubland Alliance (A3174)**

*Atriplex polycarpa* Association

**51b.** *Atriplex canescens* dominant or co-dominant in stands.

**G559. Cool Semi-Desert Shrub & Herb Wash–Arroyo Group and**

**G300. Intermountain Shadscale–Saltbush Scrub Group**

***Atriplex canescens* Scrub Alliance (A0869)**

*Atriplex canescens* Association

*Atriplex canescens* Desert Wash Association

*Atriplex canescens*–*Krascheninnikovia lanata* Association

**52a.** *Isocoma acradenia* or *Suaeda moquinii* dominant or co-dominant together or with *Atriplex canescens* in stands, along washes, playas and dunes. (53)

**G537. North American Desert Alkaline-Saline Wet Scrub Group**

**52b.** Other shrubs dominant in stands, including *Atriplex hymenelytra*, *Atriplex lentiformis*, *Atriplex parryi*, *Atriplex torreyi*, *Allenrolfea occidentalis*, *Chrysothamnus albidus*, and *Sarcobatus vermiculatus*, along alkaline slopes, washes, playas, dunes, and bottomlands. (54)

**53a.** *Suaeda moquinii* dominant in stands, or co-dominant with *Atriplex canescens*.

***Suaeda moquinii* - *Salicornia rubra* - *Isocoma acradenia* Alkaline Wet Scrub Alliance (A3880)**

*Suaeda moquinii* Association

*Suaeda moquinii*–*Atriplex canescens* Association

**53b.** *Isocoma acradenia* dominant in stands.

***Suaeda moquinii* - *Salicornia rubra* - *Isocoma acradenia* Alkaline Wet Scrub Alliance (A3880)**

*Isocoma acradenia* Association

**54a.** *Atriplex hymenelytra* dominant or co-dominant with shrubs, such as *Ambrosia dumosa* or *Larrea tridentata* in stands; in varied settings.

**G569. North American Warm Semi-Desert Cliff, Scree & Pavement**

**Sparse Vegetation Group**

***Atriplex hymenelytra* Scrub Alliance (A0872)**

*Atriplex hymenelytra* Association  
*Atriplex hymenelytra* Sparse Association  
*Atriplex hymenelytra*–*Ambrosia dumosa* Association  
*Atriplex hymenelytra*–*Tidestromia oblongifolia* Association  
*Larrea tridentata* –*Atriplex hymenelytra* Association

**54b.** *Atriplex lentiformis*, *Atriplex parryi*, *Atriplex torreyi*, *Allenrolfea occidentalis*, or *Sarcobatus vermiculatus* dominant or co-dominant in stands. **(55)**

**G537. North American Desert Alkaline-Saline Wet Scrub Group**

**55a.** *Atriplex parryi* dominant in stands, including along playas and adjacent sand dunes.

***Atriplex parryi* Shrubland Alliance (A2507)**

*Atriplex parryi* Association

**55b.** Other shrubs dominant in stands. **(56)**

**56a.** *Atriplex lentiformis* or *Atriplex torreyi* dominant in stands, along playas, streams, washes, and other disturbed areas.

***Atriplex lentiformis* Shrubland Alliance (A3173)**

*Atriplex lentiformis* Association

*Atriplex torreyi* Association\*

**56b.** *Allenrolfea occidentalis* or *Sarcobatus vermiculatus* dominant or co-dominant in stands, along playas and intermittently flooded valley floors. **(57)**

**57a.** *Allenrolfea occidentalis* dominant or co-dominant in stands.

***Allenrolfea occidentalis* Wet Shrubland Alliance (A0866)**

*Allenrolfea occidentalis* Association

*Allenrolfea occidentalis*–*Suaeda moquinii* Association

**57b.** *Sarcobatus vermiculatus* or *Chrysothamnus albidus* dominant or co-dominant in stands.  
Herbaceous layer is variable.

***Sarcobatus vermiculatus* Intermountain Wet Shrubland Alliance (A1046)**

*Sarcobatus vermiculatus* / *Leymus cinereus* Association

*Sarcobatus vermiculatus* / *Distichlis spicata* Association\*

*Chrysothamnus albidus* Association\*

**58a.** Herbs >2% cover, along playas, wetlands, and riparian areas. **(59)**

**58b.** Herbs, shrubs and trees <2% cover, along playas, wetlands, riparian areas, arroyos, and washes. **(73)**

**59a.** Stands dominated by low, freshwater emergent vegetation, including *Carex douglasii*, *Juncus arcticus* spp. *littoralis* (= *Juncus balticus*), or *Juncus mexicanus*. **(60)**

**59b.** Other graminoids and forbs dominant in stands. **(61)**

60a. *Carex douglasii* dominant in stands.

**G271. Rocky Mountain-North Pacific Subalpine-Montane Mesic Grassland & Meadow Group**

***Poa secunda* - *Muhlenbergia richardsonis* - *Carex douglasii* Moist Meadow Alliance (A4165)**

*Carex douglasii* Association (Provisional)

60b. *Juncus arcticus* spp. *littoralis* (= *Juncus balticus*) or *Juncus mexicanus* dominant or co-dominant in stands.

**G521. Vancouverian-Rocky Mountain Montane Wet Meadow & Marsh Group**

***Juncus balticus* - *Juncus mexicanus* Herbaceous Alliance (A1374)**

*Juncus arcticus* spp. *littoralis* Association\*

*Juncus mexicanus* Association

61a. *Cladium californicum*, *Schoenoplectus* spp., *Typha* spp., or *Phragmites australis* dominant or co-dominant in stands, along seeps, springs, streams, and lake margins. (62)

61b. *Distichlis spicata*, *Eleocharis palustris*, *Eleocharis rostellata*, *Juncus cooperi*, *Sporobolus airoides*, *Solidago* spp., or other herbs dominant or co-dominant in the herbaceous layer. Found along stream channels, lake shores, playas, seeps, and other wetland/riparian areas. (66)

62a. *Schoenoplectus americanus* or *Typha* spp. dominant in stands (63)

**G531. Arid West Interior Freshwater Marsh Group**

62b. *Cladium californicum* or *Phragmites australis* dominant in stands (64)

63a. *Schoenoplectus americanus* dominant or co-dominant in stands with plants such as *Phragmites australis*, *Typha* spp., and/or other graminoids or forbs.

***Schoenoplectus americanus* - *Schoenoplectus acutus* - *Schoenoplectus californicus* Marsh Alliance (A3895)**

*Schoenoplectus americanus* Association

63b. *Typha* spp. (*T. domingensis* or *T. latifolia*) dominant in stands.

***Typha domingensis* - *Typha latifolia* - *Typha angustifolia* Western Marsh Alliance (A3896)**

*Typha domingensis* Association

*Typha (latifolia, angustifolia)* Association

64a. *Cladium californicum* is present and dominant or co-dominant with *Arundo donax* or *Phragmites australis* in intermittent to dense cover along with a variety of other herbs including *Distichlis spicata*. *Vitis arizonica* or *Pluchea sericea* is usually often present in the shrub layer, at sparse cover. Found at alkali calcareous springs and washes at various elevations.

**G538. North American Desert Alkaline-Saline Marsh & Playa Group**

***Cladium californicum* Alkaline Seep Alliance (A4164)**

*Cladium californicum* Association

**64b.** *Phragmites australis* dominant in the herbaceous layer, and other plants such as *Atriplex lentiformis*, *Pluchea* spp., or *Typha* spp. present at sparse cover. Occurring along stream channels, playa margins, and lake shores. (65)

**65a.** *Phragmites australis* ssp. *americanus* dominant in the herbaceous layer, and other plants such as *Atriplex lentiformis*, *Pluchea* spp., or *Typha* spp. present at sparse cover. Occurring along stream channels, playa margins, and lake shores.

**G531. Arid West Interior Freshwater Marsh Group**  
***Typha domingensis* - *Typha latifolia* - *Typha angustifolia***  
**Western Marsh Alliance (A3896)**

*Phragmites australis* ssp. *americanus* Native Western Marsh Association

**65b.** *Phragmites australis* ssp. *australis* and/or hybrids dominant in the herbaceous layer. Occurring along stream channels and lake shores.

**G524. Western North American Ruderal Marsh, Wet Meadow & Shrubland Group**  
***Phragmites australis* - *Arundo donax* - *Alopecurus pratensis* Ruderal Marsh Alliance (A3847)**

*Phragmites australis* Western Ruderal Association

**66a.** *Distichlis spicata* or *Sporobolus airoides* dominant in stands. (67)

**G538. North American Desert Alkaline-Saline Marsh & Playa Group**

**66b.** Other graminoids and/or forbs dominant in stands. (68)

**67a.** *Distichlis spicata* dominant or co-dominant with plants such as *Juncus* spp. Found at alkaline alluvial flats, playas, and areas with salt-encrusted soils.

***Distichlis spicata* Alkaline Wet Meadow Alliance (A1332)**

*Distichlis spicata* Association

*Distichlis spicata*–*Juncus arcticus* var. *littoralis* Association

*Distichlis spicata*–*Juncus cooperi* Association

**67b.** *Sporobolus airoides* dominant or co-dominant with *Distichlis spicata*, found along alkaline alluvial fan remnants, drainage channels, and sandy swale hollows.

***Sporobolus airoides* - *Muhlenbergia asperifolia* - *Spartina gracilis* Alkaline Wet Meadow Alliance (A1334)**

*Sporobolus airoides* Association

*Sporobolus airoides*–*Distichlis spicata* Association\*

**68a.** *Juncus cooperi* dominant in stands or co-dominant with *Distichlis spicata*, found along playas, alkaline seeps and springs, and drainage channels.

**G538. North American Desert Alkaline-Saline Marsh & Playa Group**  
***Distichlis spicata* Alkaline Wet Meadow Alliance (A1332)**

*Juncus cooperi* Association (Provisional)

**68b.** Other graminoids or forbs dominant in stands. (69)

**69a.** *Eleocharis rostellata* or *Eleocharis palustris* dominant in stands. Found at alkali calcareous spring-fed wet meadows and seeps at higher elevations, including at DEVA.

**G521. Vancouverian-Rocky Mountain Montane Wet Meadow & Marsh Group**  
***Eleocharis palustris* - *Eleocharis rostellata* Alkaline-Saline Herbaceous Alliance (A3930)**  
*Eleocharis rostellata* Association

**69b.** Not as above. Stands dominated by other graminoids such as *Andropogon glomeratus* var. *scabriglumis*, *Schoenus nigricans*, *Muhlenbergia utilis*, or others dominant or co-dominant in stands and/or herbs such as *Anemopsis californica*, *Heliotropium curassavicum*, *Nitrophila occidentalis*, *Solidago confinis* (= *Solidago spectabilis* var. *spectabilis*), *Solidago spectabilis* dominant or co-dominant in stands; occurring along seeps and springs, including those alkaline in nature in DEVA. (70)

**70a.** Stands dominated or co-dominated by *Andropogon glomeratus* or *Schoenus nigricans*.

**G545. Colorado Plateau Hanging Garden Seep Group**  
***Calamagrostis scopulorum* - *Andropogon glomeratus* Saturated Hanging Garden**  
**Herbaceous Alliance (A2655)**  
*Andropogon glomeratus* Association (Provisional)  
*Schoenus nigricans* Association (Provisional)

**70b.** Not as above. Other graminoids or forbs dominant or co-dominant. (71)

**71a.** Stands dominated or co-dominated by *Anemopsis californica*, *Solidago confinis* (= *Solidago spectabilis* var. *confinis*), *S. spectabilis* (= *Solidago spectabilis* var. *spectabilis*), or other forbs in alkaline moist to wet meadows.

**G538. North American Desert Alkaline-Saline Marsh & Playa Group**  
***Anemopsis californica* - *Helianthus nuttallii* - *Solidago spectabilis* Alkaline**  
**Wet Meadow Alliance (A4247)**  
*Anemopsis californica* Association\*  
*Solidago (spectabilis* var. *confinis*, *spectabilis* var. *spectabilis*) Association (Provisional)

**71b.** Not as above. (72)

**72a.** Graminoids such as *Juncus* spp. Or *Muhlenbergia utilis*, or other herbs such as *Anemopsis californica*, *Heliotropium curassavicum*, or *Nitrophila occidentalis* dominant or co-dominant; occurring along alkali seeps, springs, and playas, especially those calcareous in nature in DEVA and MOJA.

**G538. North American Desert Alkaline-Saline Marsh & Playa Group**  
**Unclassified Alkali Seep & Playa Herbaceous Mapping Unit**

**72b.** Graminoids such as *Carex*, *Eleocharis*, *Juncus*, and *Muhlenbergia* spp., and herbs such as *Mimulus*, *Mirabilis*, and *Nicotiana* spp. dominant or co-dominant, occurring along freshwater seeps and springs, including those in mountains of MOJA.

**G521. Vancouverian-Rocky Mountain Montane Wet Meadow & Marsh Group**  
**Unclassified Montane Seep & Spring Herbaceous Mapping Unit**

**73a.** Stream channels along mountain ravines, washes, floodplains, and water along streams where vegetation is sparse or unvegetated. **(74)**

**73b.** Areas of unvegetated or sparsely vegetated playas, basins, lakes, and lake edges. **(76)**

**74a.** Open water of streams and rivers that are lacking vegetation cover.

**Perennial Stream Channel Mapping Unit**

**74b.** Areas not as above. **(75)**

**75a.** Rocky mountain drainages with little or no vegetation cover, and typically with seasonal or intermittent water flow.

**Montane Ravine Sparsely Vegetated Mapping Unit**

**75b.** Desert washes and floodplains on sandy, gravelly, and/or other coarse-textured sediments with little or no vegetation cover, and typically with seasonal or intermittent water flow. Shrubs are typically trace in cover including wash associates such as *Brickellia* spp., *Ambrosia eriocentra*, *Eriogonum fasciculatum*, etc.

*Hymenoclea salsola* - *Bebbia juncea* Mojave-Sonoran Desert Wash Scrub Alliance

*Ambrosia eriocentra* - *Brickellia* spp. Sparse Desert Wash Association

**76a.** Unvegetated old lake beds and basins where groundwater is close to the surface and fine-textured soils are present, and water may be present after rains.

**Playa Mapping Unit**

**76b.** Areas not as above. Lakes or lake margins. **(77)**

**77a.** Lakes where water is present year-long.

**Lake Mapping Unit**

**77b.** Lake edges where water fluctuates in draw-down zones yearly, and which may vary from lacking vegetation cover to having some vegetation cover in long-term draw-down.

**Lake Margin Mapping Unit**

\* = Not currently sampled at LAKE, DEVA or MOJA, though included in the key since the type was sampled adjacent to the Parks and may occur in the region

## Key II. Forest and Woodland Vegetation

**1a.** Evergreen forests and woodlands of higher elevation cool slopes (e.g., above 2,000 m) and in sheltered canyons. Pure or mixed stands of *Abies concolor*, *Juniperus grandis*, *Pinus flexilis*, and/or *P. longaeva* (2)

**1b.** Evergreen forests and woodlands of middle and lower elevations (usually below 3,000 m), including *Pinus monophylla*, *Juniperus californica*, *J. osteosperma*, *Quercus* spp., *Yucca brevifolia*, and *Parkinsonia* spp. (5)

**2a.** Conifer forests dominated or co-dominated by *Abies concolor*. Stands are localized in montane sites, including the Clark Mountains within MOJA.

**G226. Southern Rocky Mountain White Fir- Douglas-fir Dry Forest Group**  
***Abies concolor* Dry Forest & Woodland Alliance (A3420)**  
No defined Association

**2b.** Stands not as above, including *Juniperus grandis*, *Pinus flexilis*, and/or *P. longaeva*, in montane to subalpine sites, including in and adjacent to DEVA. (3)

**3a.** Conifer forests dominated by *Juniperus grandis* (= *Juniperus occidentalis* var. *australis*). Stands localized in subalpine sites, including adjacent to DEVA within 4 km northeast of the park.

**G243. Sierra-Cascade Cold-Dry Subalpine Woodland Group**  
***Juniperus occidentalis* var. *australis* - *Pinus albicaulis* Woodland Alliance\***  
*Juniperus occidentalis* var. *australis* / *Artemisia tridentata* Association\*

**3b.** Conifer forests dominated or co-dominated by *Pinus flexilis* and/or *Pinus longaeva*. Total tree canopy cover can be low (<10%) but still considered a tree layer. Stands are localized in subalpine sites, including the Panamint Range within DEVA. (4)

**G224. Intermountain Basins Subalpine Limber Pine–Bristlecone Pine**  
**Woodlands Group**

**4a.** Stands dominated by *Pinus longaeva*, or co-dominated by *Pinus longaeva* and *Pinus flexilis*. The shrub understory is open, and often including *Ribes cereum*, *R. montigenum*, and *Artemisia dracunculus*.

***Pinus longaeva* Forest & Woodland Alliance (A0518)**  
*Pinus longaeva* / (*Ericameria discoidea*, *Ribes* spp.) Association

**4b.** Stands dominated by *Pinus flexilis*, or co-dominated by *Pinus flexilis* and *Pinus monophylla*. The shrub understory is open to intermittent, usually with *Artemisia tridentata*.

***Pinus flexilis* Intermountain Basins Forest & Woodland Alliance (A2035)**  
*Pinus flexilis* / *Artemisia tridentata* Association

**5a.** Conifer forests of pinyon-juniper woodlands occupying a variety of habitats, including barrens and steep, exposed slopes. Total tree canopy cover can be low (<10%) but still considered a tree layer. Woodlands are dominated by a single or mix of *Pinus edulis*, *Pinus monophylla*, *Juniperus*

*osteosperma* and/or *Juniperus californicus*. The understory can be quite sparse, or abundant in cover with shrubs and/or herbs. (6)

**5b.** Forests and woodlands with other taxa dominant, including *Quercus chrysolepis*, *Yucca brevifolia*, *Fouquieria splendens*, and *Parkinsonia* spp. (10)

**6a.** Stands dominated by *Pinus monophylla*, or co-dominated by *Pinus monophylla* with *Juniperus* spp. and/or *Quercus turbinella* in stands.

**G247. Great Basin Pinyon - Juniper Woodland Group**

***Pinus monophylla* - *Juniperus osteosperma* / Shrub Understory**

**Woodland Alliance (A2108)**

*Pinus monophylla*–(*Juniperus osteosperma*) / *Artemisia tridentata* Association

*Pinus monophylla*–*Juniperus osteosperma* / *Artemisia nova* Association

*Pinus monophylla*–(*Juniperus osteosperma*) / *Cercocarpus intricatus* Association

*Pinus monophylla*–*Juniperus osteosperma* / *Cercocarpus ledifolius* Association

*Pinus monophylla*–*Juniperus osteosperma* / *Coleogyne ramosissima* Association

*Pinus monophylla* / *Eriogonum fasciculatum* Association

*Pinus monophylla* / *Garrya flavescens* Association

*Pinus monophylla* / *Prunus fasciculata*–*Rhus trilobata* Association

*Pinus monophylla*–*Juniperus osteosperma* / *Purshia stansburiana* Association

*Pinus monophylla*–*Juniperus osteosperma* / *Quercus turbinella* Association

*Pinus monophylla* / *Ribes velutinum* Association

*Pinus monophylla*–*Juniperus osteosperma* / Sparse Understory Association

**6b.** Other trees dominant or co-dominant in the overstory. (7)

**7a.** *Pinus edulis* is dominant or co-dominant with *Juniperus osteosperma* and/or *Quercus turbinella*.

**G250. Colorado Plateau Pinyon - Juniper Woodland Group**

***Pinus edulis* – *Juniperus osteosperma* / Shrub Understory Colorado Plateau Woodland &**

**Scrub Alliance (A3573)**

*Pinus edulis*–*Juniperus osteosperma* / *Quercus turbinella* Association

**7b.** *Juniperus osteosperma*, *Juniperus californica*, or *Quercus turbinella* dominant or co-dominant in stands. (8)

**8a.** *Quercus turbinella* is dominant in the overstory, or co-dominant with *Juniperus californica*; a variety of other smaller shrubs may also be present including *Eriogonum fasciculatum* and *E. wrightii*. If *Pinus* is present with at least 3% absolute cover with *Q. turbinella*, use key step (5) or (7) instead; except if *Q. turbinella* is at least 4x the cover with low pine cover, key here.

**G281. Western Madrean Chaparral Group**

***Quercus turbinella* Chaparral Alliance (A0793)**

*Quercus turbinella*–*Baccharis sergiloides* Association

*Quercus turbinella*–*Juniperus californica*–*Eriogonum* spp. Association

**8b.** Stands dominated by *Juniperus osteosperma* or *Juniperus californica* (9)

**9a.** *Juniperus californica* dominant in the overstory. *Pinus monophylla*, *Quercus turbinella* or *Yucca brevifolia*, if present, are < 3 times the cover of the *Juniperus*.

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**

***Juniperus californica* Mojave Scrub Alliance (A0502)**

*Juniperus californica* / *Coleogyne ramosissima* Association

*Juniperus californica* / *Nolina bigelovii* Association (Provisional)

*Juniperus californica* / *Yucca schidigera* / *Pleuraphis rigida* Association

**9b.** *Juniperus osteosperma* dominant in the overstory.

**G246. Colorado Plateau–Great Basin Juniper Open Woodland Group**

***Juniperus osteosperma* / Shrub UnderstoryWoodland Alliance (A3496)**

*Juniperus osteosperma*/ *Artemisia nova* Association\*

*Juniperus osteosperma* / *Artemisia tridentata* ssp. *tridentata* Association

*Juniperus osteosperma* / *Coleogyne ramosissima* Association

*Juniperus osteosperma* / *Eriogonum fasciculatum*–*Yucca baccata* Association

*Juniperus osteosperma*–*Yucca brevifolia* / *Bouteloua eriopoda* Association

**10a.** Broadleaf evergreen *Quercus* spp. dominant, or *Yucca brevifolia* dominant or co-dominant at mid to high-elevations, usually in the same zone as *Coleogyne ramosissima*, *Ephedra* spp., and *Lycium andersonii*. **(11)**

**10b.** Deciduous tall shrubs (i.e., *Fouquieria splendens*, *Parkinsonia* spp.) dominant at low to mid-elevations, usually in the same zone as *Larrea tridentata* and *Encelia farinosa* on hills and slopes. **(12)**

**11a.** *Quercus chrysolepis* dominant in the overstory.

**G195. Californian Broadleaf Forest & Woodland Group**

***Quercus chrysolepis* - *Quercus kelloggii* Forest & Woodland Alliance (A3349)**

*Quercus chrysolepis* / *Rhamnus ilicifolia* Association

**11b.** *Yucca brevifolia* dominant in the overstory with sparse to intermittent cover; various shrubs present and may have higher cover, along slopes, mesas, and other upland sites.

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**

***Yucca brevifolia* Wooded Shrubland Alliance (A3148)**

*Yucca brevifolia* / (*Artemisia tridentata*–*Atriplex confertifolia*) Association

*Yucca brevifolia* / *Coleogyne ramosissima* Association

*Yucca brevifolia* / *Cylindropuntia acanthocarpa* Association

*Yucca brevifolia* / *Larrea tridentata*–*Yucca schidigera* / *Pleuraphis rigida* Association

*Yucca brevifolia* / *Lycium andersonii*–*Ephedra nevadensis* Association

*Yucca brevifolia* / (*Prunus fasciculata*–*Salazaria mexicana*) Association

*Yucca brevifolia* / (*Yucca baccata*)/*Pleuraphis jamesii*–*Bouteloua eriopoda* Association

**12a.** *Parkinsonia aculeata* or *Parkinsonia microphylla* dominant in the overstory. **(13)**

**12b.** *Fouquieria splendens* dominant in the overstory tall shrub layer with sparse cover, and *Encelia farinosa* and/or *Larrea tridentata* often present and dominant in the shrub layer, along hills and ridges. **(14)**

**13a.** *Parkinsonia microphylla* dominant or co-dominant in the overstory often with sparse cover, and variable cover of shrubs are intermixed, along washes and north-facing lower-elevation slopes.

**G293. Sonoran Paloverde - Mixed Cacti Desert Scrub Group**  
***Carnegiea gigantea* - *Parkinsonia microphylla* - *Prosopis velutina***  
**Desert Scrub Alliance (A3282)**  
*Parkinsonia microphylla*–*Larrea tridentata* Association

**13b.** *Parkinsonia aculeata* dominant in the overstory, as planted trees, and the understory is dominated by *Larrea tridentata* and *Encelia farinosa*.

**G295. Mojave-Sonoran Bajada & Valley Desert Scrub Group**  
***Larrea tridentata* - *Encelia farinosa* - *Fouquieria splendens* Upper Bajada & Rock Outcrop**  
**Desert Scrub Alliance (A3278)**  
No Association currently defined (in association with *P. aculeata*)

**14a.** *Fouquieria splendens* dominant in the overstory, and *Encelia farinosa* and/or other shrubs dominant as lower shrubs.

**G295. Mojave-Sonoran Bajada & Valley Desert Scrub Group**  
***Fouquieria splendens* Desert Scrub Alliance (cf. A3278)**  
*Fouquieria splendens* Association  
*Fouquieria splendens* / *Encelia* (*farinosa*, *resinifera*) Association

**14b.** *Fouquieria splendens* is dominant in the overstory, and *Larrea tridentata* and *Ambrosia dumosa* co-dominant as lower shrubs.

***Larrea tridentata* - *Ambrosia dumosa* Bajada & Valley Desert Scrub Alliance (A3277)**  
*Larrea tridentata*–*Ambrosia dumosa*–*Fouquieria splendens* Association

\* = Not currently sampled at CAMO, LAKE, DEVA or MOJA, though included in the key since the type was sampled adjacent to the Parks and may occur in the region

### Key III. Shrubland Vegetation

Shrubland stands developed along mountains, slopes and ridges, upland flats, alluvial fans, and other sites that are not typically riparian or ground-water dependent, including bajadas, sand dunes, sand flats, and gypsum hills.

**1a.** *Artemisia* spp., *Atriplex confertifolia*, *Buddleja utahensis*, *Cercocarpus* spp., *Coleogyne ramosissima*, *Encelia actonii*, *Ephedra nevadensis*, *Ephedra viridis*, *Eriogonum* spp., *Grayia spinosa*, *Gutierrezia* spp., *Krascheninnikovia lanata*, *Lepidospartum latisquamum*, *Mortonia utahensis*, *Purshia* spp., *Prunus* spp., *Quercus turbinella*, *Salazaria mexicana*, *Viguiera* spp., *Yucca schidigera*, and/or other shrubs dominant or co-dominant as shrubs, occurring in middle to higher elevation stands, steep rock outcrops, hills and ridges, and bases of mountains along uppermost bajadas. **(2)**

**1b.** Shrub canopy not like above. Stands dominated by species such as *Ambrosia dumosa*, *Atriplex* spp., *Encelia farinosa*, *Ephedra californica*, *Ephedra torreyana*, *Ephedra trifurca*, *Fouquieria splendens*, *Larrea tridentata*, *Peucephyllum schottii*, *Pleurocoronis pluriseta*, and *Psoralea* spp., occurring in lower to mid elevation stands such as bajadas and basins. **(42)**

**2a.** *Coleogyne ramosissima*, *Purshia stansburiana*, or *Mortonia utahensis* dominant or co-dominant in stands **(3)**

**2b.** Shrub canopy not like above, including *Artemisia* spp., *Ephedra* spp., *Eriogonum* spp., *Grayia spinosa*, *Gutierrezia* spp., and many other shrubs **(5)**

**3a.** Stands with *Mortonia utahensis* or *Purshia stansburiana* dominant or co-dominant with other shrubs including *Agave utahensis*, *Artemisia tridentata*, *Buddleja utahensis*, and/or *Coleogyne ramosissima*. Typically on carbonate/limestone rock outcrops. **(4)**

#### **G296. Mojave Mid-Elevation Mixed Desert Scrub Group**

**3b.** *Coleogyne ramosissima* dominant or co-dominant with other shrubs such as *Larrea tridentata*, *Ephedra* spp., *Eriogonum fasciculatum*, *Gutierrezia sarothrae*, and/or *Yucca schidigera*. Found on hills, slopes, and ridges with variable parent material including granite and metamorphic substrates.

#### **G312. Colorado Plateau Blackbrush - Mormon-tea Shrubland Group and**

#### **G296. Mojave Mid-Elevation Mixed Desert Scrub Group**

#### ***Coleogyne ramosissima* Mojave Desert Scrub Alliance (A3144)**

*Coleogyne ramosissima* Association

*Coleogyne ramosissima*–*Ephedra* spp. (*E. nevadensis*) Association

*Coleogyne ramosissima*–*Ericameria teretifolia* Association

*Coleogyne ramosissima*–*Eriogonum fasciculatum* Association

*Coleogyne ramosissima*–*Larrea tridentata* Association

*Coleogyne ramosissima*–*Lycium andersonii* Association

*Coleogyne ramosissima* / *Pleuraphis jamesii* Association

**4a.** *Mortonia utahensis* dominant or co-dominant with shrubs such as *Agave utahensis*, *Coleogyne ramosissima*, *Gutierrezia* spp., and *Purshia stansburiana*. Often on carbonate parent material.

***Mortonia utahensis* Shrubland Alliance (A4158)**

*Mortonia utahensis* Association

**4b.** *Purshia stansburiana* dominant or co-occurring as a co-dominant (or sometimes sub-dominant) with shrubs such as *Agave utahensis*, *Artemisia tridentata*, *Buddleja utahensis*, *Coleogyne ramosissima*, *Ephedra viridis*, *Ericameria nauseosa*, *Gutierrezia microcephala*, and/or *Yucca baccata*.

***Purshia stansburiana* Scrub Alliance (A0833)**

*Coleogyne ramosissima*–*Purshia stansburiana* Association

*Purshia stansburiana* Association

*Purshia stansburiana*–*Agave utahensis* Association

*Purshia stansburiana*–*Artemisia tridentata* Association

**5a.** *Atriplex confertifolia*, *Amphipappus fremontii*, *Encelia actonii*, *Encelia virginensis*, *Lepidium fremontii*, *Salvia funerea*, *Viguiera reticulata* dominant or co-dominant in stands. **(6)**

**5b.** Shrub canopy not like above in stands. **(9)**

**6a.** *Amphipappus fremontii*, *Salvia funerea*, *Viguiera reticulata*, *Encelia actonii*, or *Encelia virginensis* dominant or co-dominant in stands. **(7)**

**6b.** *Atriplex confertifolia* or *Lepidium fremontii* dominant or co-dominant in stands with other shrubs including *Ambrosia dumosa*, *Ephedra nevadensis*, *Grayia spinosa*, *Krascheninnikovia lanata*, and *Picrothamnus desertorum*.

**G300. Intermountain Shadscale–Saltbush Scrub Group**

***Atriplex confertifolia* Scrub Alliance (A0870)**

*Atriplex confertifolia* Great Basin Association

*Atriplex confertifolia*–*Ambrosia dumosa* Association

*Atriplex confertifolia*–*Atriplex canescens* Association

*Atriplex confertifolia*–*Ephedra nevadensis* Association

*Atriplex confertifolia*–*Krascheninnikovia lanata* Association

*Atriplex confertifolia*–*Lepidium fremontii* Association

*Atriplex confertifolia*–*Lycium andersonii* Association

*Atriplex confertifolia*–*Picrothamnus desertorum* Association

*Atriplex confertifolia*–*Suaeda moquinii* Association

**7a.** *Amphipappus fremontii* or *Salvia funerea* dominant or co-dominant in stands with other shrubs such as *Ambrosia dumosa*, *Atriplex* spp., *Brickellia* spp., *Eriogonum fasciculatum*, and *Pleurocoronis pluriseta*, often on calcareous mountains and harsh ridges in DEVA.

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**

***Amphipappus fremontii* - *Salvia funerea* Shrubland Alliance (A4159)**

*Amphipappus fremontii* (limestone) Association

**7b.** Stands not like above. *Encelia actonii*, *Encelia virginensis* or *Viguiera reticulata* dominant, along canyon walls, slopes, and ridges that experience rockfall/colluvium. (8)

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

**8a.** *Viguiera reticulata* dominant or co-dominant in stands, on varied substrates, including calcareous substrates, other sedimentary rocks, and mixed alluvium.

***Encelia actonii* - *Encelia virginensis* - *Viguiera reticulata* Shrubland Alliance (A4163)**

*Viguiera reticulata* Association

**8b.** *Encelia actonii* or *Encelia virginensis* dominant in stands, often on calcareous substrates.

***Encelia actonii* - *Encelia virginensis* - *Viguiera reticulata* Shrubland Alliance (A4163)**

*Encelia actonii* Association

*Encelia virginensis* Association

**9a.** *Eriogonum heermannii* and/or *Buddleja utahensis* dominant, co-dominant or characteristically present in stands. (10)

**9b.** Plants not like above in stands. (11)

**10a.** *Buddleja utahensis* and/or *Eriogonum heermannii* dominant, co-dominant or characteristically present in stands with other shrubs including *Dedeckera eurekaensis*, *Eriogonum fasciculatum*, *Gutierrezia* spp., *Scopulophila rixfordii*, and others. Often on but not exclusive to calcareous substrates.

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**

***Eriogonum wrightii* - *Eriogonum heermannii* - *Buddleja utahensis* Shrubland Alliance (A4167)**

(*Buddleja utahensis*–*Eriogonum heermannii*)–*Gutierrezia* spp. Association

*Eriogonum heermannii* Shrubland Association (Provisional)

**10b.** *Peucephyllum schottii*, *Pleurocoronis pluriseta* and/or *Eucnide urens* dominant or co-dominant in stands. On or off calcareous substrates.

**G569. North American Warm Semi-Desert Cliff, Scree & Pavement**

**Sparse Vegetation Group**

***Peucephyllum schottii* - *Pleurocoronis pluriseta* Scrub Alliance (A3143)**

*Peucephyllum schottii* Association

*Peucephyllum schottii*–*Eucnide urens*–*Pleurocoronis pluriseta* Association

**11a.** *Gutierrezia microcephala* or *Gutierrezia sarothrae* clearly dominant, and other plants including *Ephedra* spp., *Eriogonum* spp., *Cylindropuntia* spp., *Mortonia utahensis* are present at lower cover. Herbs are present and include *Bromus rubens*, *Mirabilis laevis*, *Muhlenbergia porteri*, and *Sphaeralcea ambigua*.

**G310. Intermountain Semi-Desert Steppe & Shrubland Group**

***Gutierrezia sarothrae* - *Gutierrezia microcephala* Dwarf-shrubland Alliance (A3203)**

*Gutierrezia sarothrae* / *Pleuraphis rigida* – *Sphaeralcea ambigua* Association

*Gutierrezia sarothrae*–*Ephedra* spp.–*Agave utahensis* Association\*  
*Gutierrezia (microcephala, sarothrae)* Association

**11b.** Plants in stands not like above. If *Gutierrezia* is present, it is not clearly dominant. **(12)**

**12a.** Stands with *Hecastocleis shockleyi* dominant or co-dominant with other shrubs such as *Tetradymia axillaris*, on moderate to steep slopes that are typically calcareous in parent material.

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**  
***Eriogonum wrightii* - *Eriogonum heermannii* - *Buddleja utahensis* Shrubland Alliance (A4167)**  
*Hecastocleis shockleyi* Shrubland Association

**12b.** Plants in stands not like above. **(13)**

**13a.** *Artemisia arbuscula*, *Artemisia nova*, *Artemisia tridentata*, *Cercocarpus intricatus*, *Cercocarpus ledifolius*, *Purshia tridentata* var. *glandulosa* (= *Purshia glandulosa*), or *Purshia tridentata* var. *tridentata* (= *Purshia tridentata*) dominant or co-dominant in stands. **(14)**

**13b.** Plants in stands not like above **(20)**

**14a.** *Artemisia arbuscula* or *Artemisia nova* dominant or co-dominant in stands. **(15)**

**G308. Intermountain Low & Black Sagebrush Steppe & Shrubland Group**

**14b.** Not as above. *Artemisia tridentata*, *Cercocarpus intricatus*, *Cercocarpus ledifolius*, *Lepidospartum latissquumum*, *Purshia tridentata* var. *glandulosa* (= *Purshia glandulosa*), or *Purshia tridentata* var. *tridentata* (= *Purshia tridentata*) dominant or co-dominant in stands. **(16)**

**15a.** *Artemisia arbuscula* dominant or co-dominant in stands.

***Artemisia arbuscula* ssp. *arbuscula* Shrubland Alliance (A3219)**  
No defined Association

**15b.** *Artemisia nova* dominant or co-dominant in stands.

***Artemisia nova* Shrubland Alliance (A3222)**  
*Artemisia nova* Association

**16a.** *Cercocarpus intricatus* or *Cercocarpus ledifolius* dominant in stands though other shrubs such as *Artemisia tridentata* can be present in stands. **(17)**

**16b.** *Artemisia tridentata*, *Purshia tridentata* var. *glandulosa* (= *Purshia glandulosa*), or *Purshia tridentata* var. *tridentata* (= *Purshia tridentata*) dominant or co-dominant in stands. **(18)**

**17a.** *Cercocarpus intricatus* dominant in stands.

**G276. Southern Rocky Mountain Mountain-mahogany - Foothill Shrubland Group**  
***Amelanchier utahensis* - *Cercocarpus montanus* - *Cercocarpus intricatus* Shrubland Alliance**  
**(A3732)**  
*Cercocarpus intricatus* Association

**17b.** *Cercocarpus ledifolius* dominant in stands.

**G249. Intermountain Basins Curl-leaf Mountain-mahogany Woodland & Scrub Group**

***Cercocarpus ledifolius* / Shrub Understory Woodland Alliance (A0586)**

*Cercocarpus ledifolius*–*Artemisia tridentata* Association

**18a.** *Purshia tridentata* var. *glandulosa* (= *Purshia glandulosa*) or *Purshia tridentata* var. *tridentata* (= *Purshia tridentata*) dominant in stands or co-dominant with *Artemisia tridentata* or other shrubs.

**G302. Intermountain Mesic Tall Sagebrush Steppe & Shrubland Group**

***Purshia tridentata* - *Artemisia tridentata* Mesic Steppe & Shrubland Alliance (A3179)**

*Purshia glandulosa* Association

*Purshia glandulosa*–*Artemisia tridentata* Association

**18b.** *Artemisia tridentata* dominant or co-dominant with other shrubs such as *Coleogyne ramosissima*, *Chrysothamnus viscidiflorus*, *Ephedra* spp., and *Ericameria* spp. **(19)**

**19a.** *Artemisia tridentata* ssp. *vaseyana* dominant or co-dominant with shrubs such as *Ephedra viridis*.

**G304. Intermountain Mountain Big Sagebrush Steppe & Shrubland Group**

***Artemisia tridentata* ssp. *vaseyana* – Mixed Shrubland Alliance (A3208)**

*Artemisia tridentata* ssp. *vaseyana* Association

*Artemisia tridentata* ssp. *vaseyana*–*Ephedra viridis* Association

**19b.** *Artemisia tridentata* ssp. *tridentata* (or subspecies unknown) dominant or co-dominant with other shrubs including *Chrysothamnus viscidiflorus*, *Coleogyne ramosissima*, *Ephedra nevadensis*, and/or *Ericameria* spp.

**G303. Intermountain Dry Tall Sagebrush Steppe & Shrubland Group**

***Artemisia tridentata* – Mixed Shrub Dry Steppe & Shrubland Alliance (A3198)**

*Artemisia tridentata* Association

*Artemisia tridentata* / *Pleuraphis jamesii* Association

*Artemisia tridentata*–*Chrysothamnus viscidiflorus* / (*Poa secunda*) Association

*Artemisia tridentata*–*Ephedra nevadensis* Association

*Artemisia tridentata*–*Ericameria nauseosa* Association

*Artemisia tridentata*–*Ericameria teretifolia* Association

**20a.** *Chrysothamnus viscidiflorus*, *Ericameria nauseosa*, or *Lepidospartum latissquamum* dominant or co-dominant in stands. Other shrubs often present at lower cover, including *Artemisia tridentata*, *Atriplex* spp., *Gutierrezia* spp., and *Prunus fasciculata*. **(21)**

**G310. Intermountain Semi-Desert Steppe & Shrubland Group and**

**G559. Cool Semi-Desert Shrub & Herb Wash-Arroyo Group**

**20b.** Plants in stands not like above. **(22)**

**21a.** *Chrysothamnus viscidiflorus* dominant in stands.

***Chrysothamnus viscidiflorus* Shrubland and Shrub Herbaceous Alliance (A3195)**

*Chrysothamnus viscidiflorus* Shrub Herbaceous Association

**21b.** *Ericameria nauseosa* or *Lepidospartum latisquamum* dominant or co-dominant in stands.

**G310. Intermountain Semi-Desert Steppe & Shrubland Group**

***Ericameria nauseosa* Steppe & Shrubland Alliance (A3196)**

*Ericameria nauseosa* Association

*Lepidospartum latisquamum* Association

**22a.** *Grayia spinosa*, *Ericameria cooperi*, *Ericameria cuneata*, *Ephedra nevadensis*, *Krascheninnikovia lanata*, *Lycium andersonii*, *Lycium cooperi*, *Menodora spinescens*, *Picrothamnus desertorum*, or *Thamnosma montana*, dominant or co-dominant in stands. **(23)**

**22b.** Plants in stands not like above **(29)**

**23a.** *Krascheninnikovia lanata* dominant in stands, or co-dominant with other shrubs.

**G310. Intermountain Semi-Desert Steppe & Shrubland Group**

***Krascheninnikovia lanata* Steppe & Dwarf-shrubland Alliance (A3202)**

*Krascheninnikovia lanata* Association

*Krascheninnikovia lanata*–*Gutierrezia* spp. / *Bouteloua eriopoda*–*Pleuraphis rigida* Association\*

**23b.** *Grayia spinosa*, *Ephedra nevadensis*, *Ericameria cooperi*, *Lycium andersonii*, *Lycium cooperi*, *Menodora spinescens*, *Picrothamnus desertorum*, or *Thamnosma montana*, dominant or co-dominant in stands. **(24)**

**24a.** *Grayia spinosa* dominant or co-dominant in stands with shrubs such as *Ephedra nevadensis*, *Eriogonum fasciculatum*, *Lycium andersonii*, and *Picrothamnus desertorum*.

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**

***Ephedra nevadensis* - *Lycium andersonii* - *Grayia spinosa* Scrub Alliance (A4245)**

*Grayia spinosa* Association

*Grayia spinosa*–*Larrea tridentata* Association

*Grayia spinosa*–*Lycium andersonii* Association

*Grayia spinosa*–*Picrothamnus desertorum* Association

**24b.** *Ephedra nevadensis*, *Ericameria cooperi*, *Ericameria cuneata*, *Lycium andersonii*, *Lycium cooperi*, *Menodora spinescens* dominant or co-dominant in stands. **(25)**

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**

**25a.** *Menodora spinescens* dominant or often co-dominant in stands with shrubs such as *Ambrosia dumosa*, *Ephedra nevadensis*, *Eriogonum fasciculatum*, *Grayia spinosa*, and *Lycium andersonii*.

***Menodora spinescens* Dwarf-shrubland Alliance (A2515)**

*Menodora spinescens*–(*Ephedra nevadensis*) Association

*Menodora spinescens*–*Atriplex confertifolia* Association

**25b.** *Ephedra nevadensis*, *Ericameria cooperi*, *Ericameria cuneata*, *Lycium andersonii* or *Lycium cooperi* dominant or co-dominant in stands with these or other shrubs. **(26)**

**26a.** *Ephedra nevadensis* dominant or often co-dominant in stands with *Ericameria cooperi*, *Lycium andersonii*, *Picrothamnus desertorum*, *Psoralea* spp., and/or other shrubs. Sometimes *Ericameria cooperi* is dominant and *E. nevadensis* is sub-dominant.

***Ephedra nevadensis* - *Lycium andersonii* - *Grayia spinosa* Scrub Alliance (A4245)**

*Ephedra nevadensis*–(*Salazaria mexicana*, *Hymenoclea salsola*) Association

*Ephedra nevadensis*–*Ericameria cooperi* Association

*Ephedra nevadensis*–*Lycium andersonii* Association

**26b.** Plants not like above. (27)

**27a.** *Lycium andersonii* or *Lycium cooperi* dominant or co-dominant in stands with shrubs such as *Krameria erecta* or *Larrea tridentata*.

***Ephedra nevadensis* - *Lycium andersonii* - *Grayia spinosa* Scrub Alliance (A4245)**

*Lycium andersonii* Association

*Lycium cooperi* Association (provisional)

**27b.** *Ericameria cooperi*, *Ericameria cuneata*, *Grusonia parishii*, or a diverse mixture of various mid-elevation shrubs dominant in stands, and other shrubs including *Acamptopappus sphaerocephala*, *Cylindropuntia* spp., *Hymenoclea salsola*, and *Gutierrezia* spp. often present at lower cover. (28)

**28a.** *Ericameria cooperi*, *Grusonia parishii*, *Acamptopappus sphaerocephala* dominant, and/or a diverse mixture of shrubs dominant at low cover in stands while *Pleuraphis rigida* is dominant or co-dominant with other grasses including *Muhlenbergia porteri* in the herbaceous layer, and usually much higher in cover than the shrubs.

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**

***Cylindropuntia acanthocarpa* / *Pleuraphis rigida* Shrubland Alliance (A4156)**

*Pleuraphis rigida* / (*Acamptopappus sphaerocephalus*–*Ericameria cooperi*) Association

**28b.** *Ericameria cuneata* dominant or co-dominant in stands. *Achnatherum* spp. and other grasses often present in herbaceous layer.

**G570. Intermountain Basins Cliff, Scree & Badland Sparse Vegetation Group**

***Ephedra viridis* - *Chrysothamnus viscidiflorus* - *Rhus trilobata***

**Talus Sparse Scrub Alliance (A4050)**

*Ericameria cuneata* spp. *spathulata* Association (Provisional)

**29a.** *Ceanothus greggii* (= *Ceanothus pauciflorus* and *C. vestitus*) or *Quercus turbinella* dominant or co-dominant in stands. (30)

**G281. Western Madrean Chaparral Group**

**29b.** Other plants dominant or co-dominant such as *Acacia greggii* (= *Senegalia greggii*), *Ephedra funerea*, *Ephedra viridis*, *Eriogonum fasciculatum*, *Eriogonum wrightii*, *Keckiella antirrhinoides*, *Prunus fasciculata*, *Salazaria mexicana*, *Viguiera parishii*, *Yucca brevifolia*, *Yucca schidigera*, and many others. (31)

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group,**

**G312. Colorado Plateau Blackbrush - Mormon-tea Shrubland Group and  
G541. Warm Semi-Desert Shrub & Herb Dry Wash & Colluvial Slope Group**

**30a.** *Ceanothus greggii* (= *C. pauciflorus* and *C. vestitus*) dominant in stands; found at DEVA on steep rocky slopes and ridges.

*Arctostaphylos pungens* - *Arctostaphylos pringlei* - *Ceanothus greggii* Shrubland Alliance  
(A3790)

*Ceanothus greggii* var. *vestitus* Association

**30b.** *Quercus turbinella* dominant or co-dominant in stands, found at LAKE and MOJA typically on rocky, granitic mountains.

*Quercus turbinella* Chaparral Alliance (A0793)

*Quercus turbinella*–*Juniperus californica*–*Eriogonum* spp. Association

**31a.** *Yucca brevifolia* is characteristically present and well-distributed in stands with sparse to open cover (with at least 2% cover); various shrubs present and may be high in cover, including *Acamptopappus sphaerocephalus*, *Ephedra* spp., *Grusonia parishii*, *Lycium andersonii*, and *Yucca schidigera*. Found along slopes, mesas, and other upland sites.

*Yucca brevifolia* Wooded Shrubland Alliance (A3148)

*Yucca brevifolia* / (*Artemisia tridentata*–*Atriplex confertifolia*) Association

*Yucca brevifolia* / *Coleogyne ramosissima* Association

*Yucca brevifolia* / *Cylindropuntia acanthocarpa* Association

*Yucca brevifolia* / *Larrea tridentata*–*Yucca schidigera* / *Pleuraphis rigida* Association

*Yucca brevifolia* / *Lycium andersonii*–*Ephedra nevadensis* Association

*Yucca brevifolia* / (*Prunus fasciculata*–*Salazaria mexicana*) Association

*Yucca brevifolia* / (*Yucca baccata*) / *Pleuraphis jamesii*–*Bouteloua eriopoda* Association

**31b.** Other plants dominant or characteristic in stands. (32)

**32a.** *Arctostaphylos pungens* dominant in stands.

**G281. Western Madrean Chaparral**

*Arctostaphylos pungens* - *Arctostaphylos pringlei* - *Ceanothus greggii* Shrubland Alliance  
(A3790)\*

*Arctostaphylos* - *Quercus turbinella* Shrubland Alliance\*

**32b.** Stands not like above. (33)

**33a.** *Canotia holacantha* dominant in stand. *Gutierrezia* spp., *Acacia greggii* (= *Senegalia greggii*), and *Ephedra* spp. are common to co-dominant in some stands.

**G293. Sonoran Paloverde - Mixed Cacti Desert Scrub**

*Simmondsia chinensis* - *Canotia holacantha* - *Eriogonum fasciculatum*  
Desert Scrub Alliance\* (A3283)

**33b.** Other plants dominant in stands. (34)

**34a.** *Acacia greggii* (= *Senegalia greggii*), *Ephedra funerea*, *Ephedra viridis*, *Prunus eremophila*, *Prunus fasciculata*, or *Salazaria mexicana* dominant or co-dominant on rocky slopes and ridges including colluvial sites. (35)

**34b.** Other plants dominant in stands. (39)

**35a.** *Acacia greggii* (= *Senegalia greggii*) dominant in stands.

***Acacia greggii* - *Hyptis emoryi* - *Justicia californica* Desert Wash Shrubland Alliance (A4187)**

*Acacia greggii*–*Eriogonum fasciculatum* Association

*Acacia greggii*–*Prunus fasciculata* Association

*Acacia greggii*–*Viguiera parishii* Association

**35b.** *Ephedra viridis*, *Ephedra funerea*, *Keckiella antirrhinoides*, *Prunus eremophila*, *Prunus fasciculata* and/or *Salazaria mexicana* dominant or co-dominant in stands. (36)

**36a.** *Ephedra viridis* dominant or co-dominant with plants such as *Gutierrezia* spp., *Prunus fasciculata*, or *Ericameria* spp. If *Ephedra viridis* is co-dominant with *Artemisia tridentata*, see the respective *Artemisia* alliance.

**G312. Colorado Plateau Blackbrush - Mormon-tea Shrubland Group**

***Ephedra viridis* Colorado Plateau Shrubland Alliance (A3201)**

*Ephedra viridis* Association (Provisional)

*Ephedra viridis*–*Purshia glandulosa* Association

**36b.** *Ephedra funerea*, *Keckiella antirrhinoides*, *Prunus fasciculata* and/or *Salazaria mexicana* dominant or co-dominant in stands. (37)

**37a.** *Ephedra funerea* dominant or co-dominant in stands with shrubs such as *Eriogonum fasciculatum*, *Ericameria teretifolia*, or others.

***Ephedra funerea* Shrubland Alliance (A4157)**

*Ephedra funerea* Association

**37b.** *Keckiella antirrhinoides*, *Prunus fasciculata* and/or *Salazaria mexicana* dominant or co-dominant in stands. (38)

**38a.** *Prunus fasciculata* or *Prunus eremophila* dominant in stands, or co-dominant with plants such as *Brickellia* spp., *Ericameria* spp., *Keckiella antirrhinoides*, and/or *Rhus trilobata*. Sometimes *Keckiella antirrhinoides* is higher in cover than the *Prunus fasciculata* in very small stands.

***Prunus fasciculata* - *Salazaria mexicana* Northern Mojave Desert Wash Alliance (A4185)**

*Keckiella antirrhinoides*–*Prunus fasciculata* Association (provisional)

*Prunus eremophila* Association (provisional)

*Prunus fasciculata* Association

*Prunus fasciculata*–*Ambrosia eriocentra* Association

*Prunus fasciculata*–(*Purshia stansburiana*–*Viguiera reticulata*) Association

*Prunus fasciculata*–*Rhus trilobata* Association

**38b.** *Salazaria mexicana* dominant or co-dominant in stands with shrubs such as *Gutierrezia sarothrae*, *Ephedra nevadensis*, *Prunus fasciculata*, *Salvia dorrii*, or *Viguiera reticulata*.

***Prunus fasciculata* - *Salazaria mexicana* Northern Mojave Desert Wash Alliance (A4185)**

*Salazaria mexicana* Association

*Hymenoclea salsola* - *Salazaria mexicana* Association

**39a.** *Yucca schidigera* dominant, co-dominant, or characteristically present in stands with at least 2% cover. Other shrub species may have similar or higher cover. However, if *Viguiera parishii* and *Eriogonum fasciculatum* are present, then these species combined cover is < 2 times the cover of *Yucca*.

***Yucca schidigera* Shrubland Alliance (A3147)**

*Yucca schidigera*–*Coleogyne ramosissima* Association

*Yucca schidigera*–*Opuntia acanthocarpa* Association

*Yucca schidigera*–*Eriogonum fasciculatum* Association

*Yucca schidigera*–*Larrea tridentata*–*Ambrosia dumosa* Association

*Yucca schidigera* –*Larrea tridentata*–*Ephedra nevadensis* Association

**39b.** Plants in stands not like above. (40)

**40a.** *Ericameria teretifolia* dominant in stands.

***Ericameria teretifolia* Shrubland Alliance (A2540)**

*Ericameria teretifolia* Association

**40b.** Plants in stands not like above. (41)

**41a.** *Eriogonum fasciculatum* or *Viguiera parishii* dominant in stands or co-dominant with each other and/or with other plants such as *Bebbia juncea*, *Ericameria* spp., *Encelia* spp., *Ephedra* spp., and *Gutierrezia* spp. If *Yucca schidigera* or *Acacia greggii* (= *Senegalia greggii*) is present, then combined cover of *V. parishii* and *Eriogonum fasciculatum* is >2 times the cover of the *Yucca* or *Acacia*.

***Eriogonum fasciculatum*–*Viguiera parishii* Shrubland Alliance (A3150)**

*Eriogonum fasciculatum* rock outcrop Association

*Eriogonum fasciculatum*–*Ericameria* (*laricifolia*, *linearifolia*) Association

*Viguiera parishii*–*Eriogonum fasciculatum* Association

*Viguiera parishii* Association

**41b.** *Eriogonum wrightii* dominant in stands, though other shrubs may be present including *E. fasciculatum* at lower cover.

***Eriogonum wrightii* - *Eriogonum heermannii* - *Buddleja utahensis* Shrubland Alliance (A4167)**

*Eriogonum wrightii* ssp. *wrightii* Association (Provisional)

**42a.** *Atriplex canescens*, *Atriplex polycarpa*, *Isocoma acradenia*, or *Suaeda moquinii* dominant or co-dominant, along valley floors, basins, lava flows, sand dunes and other sandy sites, alkaline sites, and low slopes. (43)

42b. Other shrubs dominant in stands. (46)

43a. *Isocoma acradenia* or *Suaeda moquinii* dominant or co-dominant in stands, along sand dunes. (44)

**G537. North American Desert Alkaline-Saline Wet Scrub Group**

43b. *Atriplex canescens* or *Atriplex polycarpa* dominant or co-dominant in stands. (45)

**G300. Intermountain Shadscale - Saltbush Scrub Group**

44a. *Suaeda moquinii* dominant in stands, or co-dominant with *Atriplex canescens*.

***Suaeda moquinii* - *Salicornia rubra* - *Isocoma acradenia* Alkaline Wet Scrub Alliance (A3880)**

*Suaeda moquinii* Association

*Suaeda moquinii*–*Atriplex canescens* Association

44b. *Isocoma acradenia* dominant in stands.

***Suaeda moquinii* - *Salicornia rubra* - *Isocoma acradenia* Alkaline Wet Scrub Alliance (A3880)**

*Isocoma acradenia* Association

45a. *Atriplex polycarpa* dominant in stands.

***Atriplex polycarpa* Shrubland Alliance (A3174)**

*Atriplex polycarpa* Association

45b. *Atriplex canescens* dominant or co-dominant with other shrubs including *Krascheninnikovia lanata*.

***Atriplex canescens* Scrub Alliance (A0869)**

*Atriplex canescens* Association

*Atriplex canescens*–*Krascheninnikovia lanata* Association

46a. *Cylindropuntia acanthocarpa*, *Cylindropuntia bigelovii*, or other cacti dominant, co-dominant or characteristically present in stands. Other shrubs such as *Ambrosia dumosa*, *Encelia farinosa*, *Ephedra nevadensis*, *Eriogonum fasciculatum*, *Larrea tridentata*, *Ferocactus cylindraceus* and other stem succulents (or, cacti) are usually present and co-dominant. Locally found on rocky alluvial fans, southeast to southwest-facing hill slopes, and ridges. (47)

46b. Plants in stands not like above. (48)

47a. *Cylindropuntia acanthocarpa* dominant or co-dominant in stands.

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**

***Cylindropuntia acanthocarpa* / *Pleuraphis rigida* Shrubland Alliance (A4156)**

*Opuntia acanthocarpa* var. *coloradensis* Association

*Pleuraphis rigida* / (*Acamptopappus sphaerocephalus*–*Ericameria cooperi*) Association

47b. *Cylindropuntia bigelovii* dominant, co-dominant or characteristically present in stands.

**G295. Mojave-Sonoran Bajada & Valley Desert Scrub Group**

***Cylindropuntia bigelovii* Shrubland Alliance (A3146)**

*Cylindropuntia bigelovii* Association

**48a.** *Atriplex parryi*, *Ephedra torreyana*, *Petalonyx thurberi*, *Prosopis glandulosa*, *Psorothamnus arborescens*, *Psorothamnus fremontii*, *Psorothamnus polydenius*, *Peucephyllum schottii* and/or *Pleurocoronis pluriseta* dominant or co-dominant in stands. Sites are typically on sand dunes and flats, on gypsum, or other strongly rocky and harsh sites. **(49)**

**48b.** *Ambrosia dumosa*, *Atriplex hymenelytra*, *Cylindropuntia bigelovii*, *Encelia farinosa*, *Ephedra californica*, *Ephedra trifurca*, *Fouquieria splendens*, and/or *Larrea tridentata* dominant or co-dominant in stands. Sites are variable. **(57)**

**49a.** *Ephedra fasciculata* is dominant in the shrub canopy, with *Aloysia wrightii* and *Bernardia myricifolia* sometimes present.

**G296. Mojave Mid-Elevation Mixed Desert Scrub  
*Ephedra fasciculata* Shrubland Alliance\* (A3139)**

*Ephedra fasciculata* Mojave Desert Shrubland Alliance\* (A.857)

**49b.** Plants in stands not like above. **(50)**

**50a.** *Ephedra torreyana* or *Ephedra trifurca* occurs as a dominant, co-dominant or characteristic with species such as *Atriplex* spp. and/or *Psorothamnus fremontii*. Typically on gypsum hills and badlands.

**G570. Intermountain Basins Cliff, Scree & Badland Sparse Vegetation Group  
*Ephedra* spp. - *Leymus salinus* - *Eriogonum corymbosum* Badlands  
Cold Desert Sparse Vegetation Alliance (A4052)**

*Ephedra torreyana*-(*Atriplex* spp.) / Nonvascular Gypsum Sparse Association  
*Ephedra trifurca* Badlands Shrubland Association\*

**50b.** *Atriplex parryi*, *Petalonyx thurberi*, *Psorothamnus* spp., *Peucephyllum schottii*, and/or *Prosopis glandulosa* dominant or co-dominant in stands. **(51)**

**51a.** *Peucephyllum schottii*, *Pleurocoronis pluriseta*, and/or *Eucnide urens* dominant in stands, or co-dominant with species such as *Psorothamnus fremontii*. Typically found along alluvial drainage channels or along moderately steep slopes to steep cliffs that are usually of volcanic and limestone substrates.

**G569. North American Warm Semi-Desert Cliff, Scree & Pavement  
Sparse Vegetation Group  
*Peucephyllum schottii* - *Pleurocoronis pluriseta* Scrub Alliance (A3143)  
*Peucephyllum schottii* Association  
*Peucephyllum schottii*-*Eucnide urens*-*Pleurocoronis pluriseta* Association**

**51b.** Plants not like above. **(52)**

**52a.** *Petalonyx thurberi* dominant, often along sand dunes and sand sheets in DEVA and MOJA.

**G675. North American Warm Semi-Desert Dune & Sand Flats Group  
*Dicoria canescens* - *Abronia villosa* - *Panicum urvilleanum* Dune Alliance (A4026)  
*Petalonyx thurberi* Association (Provisional)**

**52b.** Plants not like above. (53)

**53a.** *Prosopis glandulosa* dominant, along sand dunes. The lower shrub canopy is variable and may include high cover of shrubs such as *Atriplex* spp. and *Suaeda moquinii*.

**G533. North American Warm Desert Riparian Low Bosque & Shrubland Group**  
***Prosopis glandulosa* - *Prosopis velutina* - *Prosopis pubescens* Riparian Forest, Woodland & Shrubland Alliance (A3877)**

*Prosopis glandulosa* var. *torreyana* Association  
*Prosopis glandulosa* / (*Atriplex* spp.–*Suaeda moquinii*) (alkaline) Association

**53b.** *Atriplex parryi*, *Psorothamnus fremontii* or *Psorothamnus polydenius* dominant along sand dunes and flats, mixed alluvial fans, gypsum sites, sandstone slopes, and other sites. (54)

**54a.** *Atriplex parryi* dominant in stands.

**G537. North American Desert Alkaline-Saline Wet Scrub Group**  
***Atriplex parryi* Shrubland Alliance (A2507)**  
*Atriplex parryi* Association

**54b.** Plants not like above in stands. (55)

**55a.** *Psorothamnus arborescens* or *Psorothamnus polydenius* dominant or co-dominant with species such as *Atriplex* spp. or *Larrea tridentata*, especially along sand dunes, bases of slopes and alluvial flats with intermittent sheet flow in DEVA.

**G541. Warm Semi-Desert Shrub & Herb Dry Wash & Colluvial Slope Group**  
***Psorothamnus fremontii* - *Psorothamnus polydenius* Wash Alliance (A4186)**  
*Psorothamnus polydenius* var. *polydenius* / *Achnatherum hymenoides* Association

**55b.** *Psorothamnus fremontii* dominant or co-dominant with species such as *Ambrosia dumosa*, *Amphipappus fremontii*, or *Atriplex* spp., along sand dunes, gypsum hills, low slopes, and valleys, especially in LAKE. (56)

**56a.** *Psorothamnus fremontii* characteristically present to dominant, on gypsum slopes and alluvium.

**G570. Intermountain Basins Cliff, Scree & Badland Sparse Vegetation Group**  
***Ephedra* spp. - *Leymus salinus* - *Eriogonum corymbosum* Badlands**  
**Cold Desert Sparse Vegetation Alliance (A4052)**  
*Psorothamnus fremontii* / Cryptogamic crust (gypsum) Association

**56b.** *Psorothamnus fremontii* dominant or co-dominant, occurring along mixed alluvial drainage channels, sandstone or limestone rock outcrops, other rocky slopes that are not gypsum derived, or on sand dunes and flats.

**G541. Warm Semi-Desert Shrub & Herb Dry Wash & Colluvial Slope Group**  
***Psorothamnus fremontii* - *Psorothamnus polydenius* Wash Alliance (A4186)**  
*Psorothamnus fremontii* sand dunes/flats Association  
*Psorothamnus fremontii*–*Ambrosia dumosa* Association  
*Psorothamnus fremontii*–(*Hymenoclea salsola*) Association

**57a.** *Ephedra californica* or *Ephedra trifurca* dominant or co-dominant in stands. Often on substrates with loose sandy soil, and sites that experience disturbance.

**G541. Warm Semi-Desert Shrub & Herb Dry Wash & Colluvial Slope Group**  
***Ephedra californica* - *Ephedra trifurca* Desert Wash Shrubland Alliance (A2536)**

*Ephedra californica* Association\*

*Ephedra californica*–*Hymenoclea salsola* Association

*Ephedra trifurca* Association

**57b.** Plants not like above in stands. **(58)**

**58a.** *Atriplex hymenelytra* and/or *Tidestromia oblongifolia* dominant or co-dominant together or with *Ambrosia dumosa* or *Larrea tridentata* in stands.

**G569. North American Warm Semi-Desert Cliff, Scree & Pavement**  
**Sparse Vegetation Group**

***Atriplex hymenelytra* Scrub Alliance (A0872)**

*Atriplex hymenelytra* Association

*Atriplex hymenelytra*–*Ambrosia dumosa* Association

*Atriplex hymenelytra*–*Larrea tridentata* Association

*Atriplex hymenelytra*–*Tidestromia oblongifolia* Association

**58b.** Plants not like above in stands. **(59)**

**G295. Mojave-Sonoran Bajada & Valley Desert Scrub Group**

**59a.** *Fouquieria splendens* dominant in the taller shrub overstory with at least 2% absolute cover, and *Encelia farinosa* or other shrubs dominant as lower shrubs. Found in the Arizona side of LAKE.

***Fouquieria splendens* Desert Scrub Alliance (cf. A3278)**

*Fouquieria splendens* Association

*Fouquieria splendens* / *Encelia* (*farinosa*, *resinifera*) Association

**59b.** Plants not like above in stands. **(60)**

**60a.** *Cylindropuntia bigelovii* dominant, co-dominant or characteristically present in stands with plants such as *Encelia farinosa*.

**G295. Mojave-Sonoran Bajada & Valley Desert Scrub Group**  
***Cylindropuntia bigelovii* Shrubland Alliance (A3146)**

*Cylindropuntia bigelovii* Association

**60b.** Plants not like above in stands. **(61)**

**61a.** *Encelia farinosa* dominant in stands or co-dominant with *Ambrosia dumosa*, *Larrea tridentata*, or other shrubs. Widespread on hot (southerly exposure) mountain slopes, upper alluvial fans, and directly above or in washes. **(62)**

**61b.** Plants not like above in stands. **(63)**

**62a.** *Encelia farinosa* dominant in stands or co-dominant with *Ambrosia dumosa*, *Bebbia juncea*, *Eriogonum fasciculatum*, *Gutierrezia* spp. and/or *Peucephyllum schottii*, while other shrubs are generally lower in cover. Also, *E. farinosa* can be > 5%, while *Larrea tridentata* is <2% absolute cover. Other associated species often include *Acacia greggii* (= *Senegalia greggii*), *Ephedra nevadensis*, *Krameria* spp., and various cacti. If *Fouquieria splendens* is present in stands, it is scattered with <2% absolute cover.

***Encelia farinosa* Desert Scrub Alliance (A4125)**

*Encelia farinosa* Association

*Encelia farinosa*–*Ambrosia dumosa* Association

*Encelia farinosa*–*Peucephyllum schottii* Association

**62b.** *Encelia farinosa* and *Larrea tridentata* occur together and co-dominate stands. Both are evenly distributed (and usually at least 1% cover each, though their relative cover may vary between them across stands). *Ambrosia dumosa* may also be present but usually lower in cover.

***Larrea tridentata* - *Encelia farinosa* - *Fouquieria splendens* Upper Bajada & Rock Outcrop Desert Scrub Alliance (A3278)**

*Larrea tridentata*–*Encelia farinosa* Association

*Larrea tridentata*–*Encelia farinosa*–*Ambrosia dumosa* Association

*Larrea tridentata*–*Encelia farinosa*–*Pleurocoronis pluriseta* Association

**63a.** *Ambrosia dumosa* dominant or co-dominant with other shorter shrubs such as *Ephedra* or *Psoralea* spp.; if *Larrea tridentata* present, *A. dumosa* usually at least 3 times more cover than *Larrea tridentata*.

***Ambrosia dumosa* Desert Dwarf Scrub Alliance (A3279)**

*Ambrosia dumosa* Association

*Ambrosia dumosa*–*Ephedra torreyana* (–*Psoralea fremontii*) Association

**63b.** Shrub canopy not like above in stands. (64)

**64a.** *Larrea tridentata* and *Ambrosia dumosa* occur together and typically co-dominate stands. Both are evenly distributed (and usually at least 1% cover each, though their relative cover may vary between them across stands). No other shrub species greatly exceeds either of these species in cover. Occurring widespread on bajadas and other surfaces.

***Larrea tridentata* - *Ambrosia dumosa* Bajada & Valley Desert Scrub Alliance (A3277)**

*Larrea tridentata*–*Ambrosia dumosa* / Cryptogamic Crust Association

*Larrea tridentata*–*Ambrosia dumosa* / *Pleuraphis rigida* Association

*Larrea tridentata*–*Ambrosia dumosa* / (*Oenothera deltoides*–*Palafoxia arida*–*Plantago ovata*) Association

*Larrea tridentata*–*Ambrosia dumosa* Association

*Larrea tridentata*–*Ambrosia dumosa*–*Amphipappus fremontii* Association

*Larrea tridentata*–*Ambrosia dumosa*–*Atriplex confertifolia* Association

*Larrea tridentata*–*Ambrosia dumosa*–*Atriplex hymenelytra* Association

*Larrea tridentata*–*Ambrosia dumosa*–*Opuntia (acanthocarpa, ramosissima)* Association

*Larrea tridentata*–*Ambrosia dumosa*–*Ephedra funerea* Association

*Larrea tridentata*–*Ambrosia dumosa*–(*Ephedra nevadensis*–*Lycium andersonii*) Association  
*Larrea tridentata*–*Ambrosia dumosa*–*Eriogonum fasciculatum* Association  
*Larrea tridentata*–*Ambrosia dumosa*–(*Echinocactus polycephalus*–*Opuntia basilaris*) Association  
*Larrea tridentata*–*Ambrosia dumosa*–*Fouquieria splendens* Association  
*Larrea tridentata*–*Ambrosia dumosa*–*Hymenoclea salsola* Association  
*Larrea tridentata*–*Ambrosia dumosa*–*Krameria (erecta, grayi)* Association  
*Larrea tridentata*–*Ambrosia dumosa*–*Psoralea arguta* Association  
*Larrea tridentata*–*Ambrosia dumosa*–*Senna armata* Association  
*Larrea tridentata*–*Ambrosia dumosa*–*Yucca schottii* Association

**64b.** *Larrea tridentata* exceeds other shrubs in cover (including emergent tall shrubs or small trees).  
 If *Ambrosia dumosa* or *Encelia farinosa* is present, their cover is <3 times the cover of the *Larrea*.  
 Typically occurring on bajadas, desert pavement, and erosional highlands.

***Larrea tridentata* Desert Scrub Alliance (cf. A3278)**

*Larrea tridentata* Association  
*Larrea tridentata* / *Pleuraphis rigida* Association  
*Larrea tridentata*–*Atriplex polycarpa* Association  
*Larrea tridentata*–*Ephedra nevadensis* Association  
*Larrea tridentata* (sparse post–burn / herbaceous) Association

\* = Not currently sampled at LAKE, DEVA, MOJA, or CAMO, though included in the key since the type may occur in the region.

## Key IV. Herbaceous Vegetation

Stands occurring along upland flats, alluvial fans, slopes and ridges, and other sites that are not typically riparian or ground-water dependent, including bajadas, desert pavement, sand dunes, sand flats, gypsum hills, and montane settings. Herbaceous cover may vary dramatically between years depending on rainfall, particularly on sand flats, dunes, and pavements.

**1a.** Herbaceous vegetation dominated or co-dominated by native herbaceous species. **(2)**

**1b.** Herbaceous vegetation strongly dominated (> 90% relative cover) by introduced herbaceous species, *Brassica tournefortii*, *Bromus rubens*, *Bromus tectorum*, *Malcolmia africana*, *Schismus arabicus*, *S. barbatus*, or other invasive, introduced plants. *Eriogonum deflexum* or other *Eriogonum* spp. may also be present and seasonally abundant in disturbed areas. **(16)**

**2a.** Native bunch grasses and perennial grasses dominant, including *Bouteloua* spp., *Pleuraphis jamesii*, *Pleuraphis rigida*, *Sporobolus* spp., and /or *Achnatherum* spp. Scattered shrubs and dwarf-shrubs often are present at low cover. **(3)**

**2b.** Stands not as above; other native plants dominant, co-dominant, or characteristic. **(10)**

**3a.** Stands dominated by *Sporobolus airoides* in small areas with sands or moist sandy loams, which may be alkaline or saline.

**G538. North American Desert Alkaline-Saline Marsh & Playa Group**  
***Sporobolus airoides* - *Muhlenbergia asperifolia* - *Spartina gracilis* Alkaline Wet**  
**Meadow Alliance (A1334)**  
*Sporobolus airoides* Association  
*Sporobolus airoides*–*Distichlis spicata* Association\*

**3b.** Stands dominated by an *Achnatherum* spp., *Pleuraphis* spp., or other perennial grasses. Soils sandy or gravelly loams, not alkaline or saline. **(4)**

**4a.** *Pleuraphis rigida* dominant or co-dominant in stands; sometimes or *Bouteloua eriopoda* or *Muhlenbergia porteri* is co-dominant with this *Pleuraphis rigida* in stands.

**4b.** Not as above. Stands dominated by other perennial grasses. **(7)**

### **G311. Intermountain Semi-Desert Grassland Group**

**5a.** *Pleuraphis rigida* dominant or co-dominant with other grasses and forbs, typically on sand sheets, dune aprons, stabilized dunes near playas, sandy washes, and sandy valley floors.

**G675. North American Warm Semi-Desert Dune & Sand Flats Group**  
***Pleuraphis rigida* Desert Grassland Alliance**  
*Pleuraphis rigida* sand dunes/flats Association  
*Pleuraphis rigida* / *Ambrosia dumosa* Association  
*Pleuraphis rigida* – *Muhlenbergia porteri* Association\*

**5b.** *Pleuraphis rigida* is found in other settings. **(6).**

**6a.** *Kraschenninikovia lanata* and/or *Gutierrezia* spp. representative in shrub cover with *Pleuraphis rigida* and *Bouteloua eriopoda*. Typically in sandy basins with cool air drainage.

**G310. Intermountain Semi-Desert Steppe & Shrubland Group**  
***Krascheninnikovia lanata* Steppe & Dwarf-shrubland Alliance (A3202)**

*Krascheninnikovia lanata* Association  
*Kraschenninikovia lanata*–*Gutierrezia* spp. / *Bouteloua eriopoda*–*Pleuraphis rigida* Association

**6b.** Stands not as above; *Pleuraphis rigida* dominant or co-dominant in stands, on colluvial slopes along hills and mountainous settings, or upon disturbed grazing lands or in post-burn shrubland settings. Other shrubs may be present such as *Acamptopappus sphaerocephalus*, *Ericameria cooperi*, and *Cylindropuntia acanthocarpa*.

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**  
***Cylindropuntia acanthocarpa* / *Pleuraphis rigida* Shrubland Alliance (A4156)**

*Cylindropuntia acanthocarpa* var. *coloradensis* Association  
*Pleuraphis rigida* / (*Acamptopappus sphaerocephalus*–*Ericameria cooperi*) Association

**7a.** *Pleuraphis jamesii* dominant or other grasses and forbs such as *Bouteloua eriopoda*, *Bouteloua gracilis*, *Bromus rubens*, *Erodium cicutarium*, *Muhlenbergia porteri*, and/or *Scleropogon breviflorus* are co-dominant (or rarely dominant). Often on gentle to moderately steep slopes that are rocky, and in some cases adjacent to unstable scree or talus. Sometimes shrubs are scattered including *Gutierrezia* spp. and *Lycium andersonii*.

***Pleuraphis jamesii* Grassland Alliance (A1287)**  
*Pleuraphis jamesii* Association  
*Bouteloua eriopoda* – *Pleuraphis jamesii* Association  
*Scleropogon brevifolius* – *Pleuraphis jamesii* – *Bouteloua eriopoda* Association

**7b.** Stands dominated or co-dominated by an *Achnatherum* (= *Stipa*) spp., or stands co-dominated by *Muhlenbergia porteri* or *Sporobolus contractus*. (8)

**8a.** *Achnatherum speciosum* dominant in stands, which are often the result of fire eliminating desert shrub cover from stands that were formerly *Coleogyne ramosissima*, *Larrea tridentata* – *Ambrosia dumosa*, *Atriplex canescens*, etc. Persistence is unknown, but stands probably develop shrub dominance in <50 years, without fire or other disturbance.

***Achnatherum speciosum* Grassland Alliance (A1290)**  
*Achnatherum speciosum* Shrub Herbaceous Association

**8b.** *Achnatherum hymenoides* or *Sporobolus contractus* characterize the stands. (9)

**9a.** *Achnatherum hymenoides* dominant to co-dominant, often on sand sheets, dune aprons and other sandy soils.

***Achnatherum hymenoides* - *Pseudoroegneria spicata* - *Muhlenbergia pungens***  
**Grassland Alliance (A1262)**  
*Achnatherum hymenoides*–*Oenothera deltoidea* Dune Grassland Association

**9b.** *Sporobolus cryptandrus* dominant or co-dominant, often in stream terraces and swales or along man-made borrow pits, on sandy to fine gravelly alluvium.

***Sporobolus cryptandrus* - *Aristida purpurea* var. *longiseta* - *Poa secunda* Sandy Stream Terrace Grassland Alliance (A3977)\***

*Sporobolus cryptandrus* Great Basin Grassland Association\*

**10a.** Herbs and shrubs sparse over sandy soils, including in flat valleys, sand sheets, and sand dunes, including *Dicoria canescens*, *Panicum urvilleanum*, *Psorothamnus* spp., or *Swallenia alexandrae*, yet other herbs or shrubs may be present at low cover. Cover of herbs varies annually with precipitation, and may be quite high in high rainfall years. **(11)**

**10b.** Stands not as above. Herbs and shrubs sparse on slopes and bajadas on a variety of substrates, including *Chorizanthe rigida*, *Geraea canescens*, *Atriplex* spp., *Ephedra torreyana*, *Psorothamnus fremontii*, or *Sphaeralcea ambigua*, yet other herbs or shrubs may be present at low cover. Cover varies annually with precipitation and may be quite high in high rainfall years. **(13)**

**11a.** Stands characterized by sparse to open cover of the shrub *Psorothamnus polydenius*, *Psorothamnus arborescens*, or *Psorothamnus fremontii*. Herbs variable in cover.

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

***Psorothamnus fremontii* - *Psorothamnus polydenius* Wash Alliance (A4186)**

*Psorothamnus polydenius* var. *polydenius* / *Achnatherum hymenoides* Association

*Psorothamnus fremontii* sand dune/flat Association (Provisional)

**11b.** Stands characterized by grasses, such as *Panicum urvilleanum* or *Swallenia alexandrae*, and/or forbs such as *Dicoria canescens*, *Abronia villosa*, *Croton californicus*, and many others. Sometimes shrubs such as *Petalonyx thurberi* may also be characteristic. **(12)**

**G675. North American Warm Semi-Desert Dune & Sand Flats Group**

**12a.** Stands characterized by annual herbs such as *Dicoria canescens*, *Abronia villosa*, *Astragalus lentiginosus*, *Croton californicus*, *Cryptantha* spp., *Dithyrea californica*, *Oenothera deltoides*, *Palafoxia arida*, *Salsola tragus*, *Tiquilia plicata*, and/or other psammophytic annuals, and/or shrubs including *Petalonyx thurberi*. Sometimes *Salsola tragus* can be dominant.

***Dicoria canescens* - *Abronia villosa* - *Panicum urvilleanum* Dune Alliance (A4026)**

*Oenothera deltoides*–*Cryptantha* spp. Association (Provisional)

*Dicoria canescens* Association

*Petalonyx thurberi* Association (Provisional)

**12b.** Stands characterized by a sparse cover of the perennial grass *Swallenia alexandrae*; restricted to sand dunes in the Eureka Valley in DEVA, OR Stands characterized by even, sparse cover of the perennial grass *Panicum urvilleanum*, restricted locally to sand dunes and broad sandy riverbeds, including in Devils Playground in MOJA. Annual herbs may also be present and variable depending on rainfall.

***Dicoria canescens* - *Abronia villosa* - *Panicum urvilleanum* Dune Alliance (A4026)**

*Swallenia alexandrae* Association

*Panicum urvilleanum* Association

**13a.** Stands on bajadas and desert pavement with seasonal cover of various herbs, including *Chorizanthe rigida*, *Chorizanthe brevicornu*, *Camissonia* spp., *Chaenactis* spp., *Cryptantha* spp., *Eriogonum* spp. and/or *Geraea canescens*.

**G569. North American Warm Semi-Desert Cliff, Scree & Pavement Sparse Vegetation Group**

***Chorizanthe rigida* - *Geraea canescens* Desert Pavement Alliance (A4024)**

*Chorizanthe rigida*–*Geraea canescens* Desert Pavement Association

**13b.** Stands not as above, with other herbs on rocky sites, bajadas, or other soils. **(14)**

**14a.** Stands on rocky areas with gypsum soils with sparse vascular cover, including herbs such as *Arctomecon californica*, *Enceliopsis argophylla*, and *Eriogonum inflatum*, and shrubs *Atriplex* spp., *Ephedra torreyana*, *Ephedra trifurca*, and/or *Psoralea fremontii*. Non-vascular plants may be present and high in cover.

**G570. Intermountain Basins Cliff, Scree & Badland Sparse Vegetation Group**

***Ephedra* spp. - *Leymus salinus* - *Eriogonum corymbosum* Badlands**

**Cold Desert Sparse Vegetation Alliance (A4052)**

*Ephedra torreyana*–(*Atriplex* spp.) / Nonvascular Gypsum Sparse Association

*Psoralea fremontii* / Cryptogamic crust (Gypsum) Association

*Ephedra trifurca* Badlands Shrubland Association\*

**14b.** Stands with sparse to high cover of other herbs including *Sphaeralcea ambigua*, *Lupinus* spp., *Amsinckia* spp., or *Phacelia* spp. **(15)**

**15a.** Stands with sparse to high cover of *Sphaeralcea ambigua*. Other herbs, shrubs and subshrubs may be present at low to high cover, including *Bromus rubens*, *Erodium cicutarium*, and *Lupinus* spp. Often in areas of post-burn disturbance and along dry lava fields.

**G311. Intermountain Semi-Desert Grassland Group**

***Sphaeralcea* (*ambigua*, *coccinea*, *parvifolia*) Dry Meadow Alliance (A4216)**

*Sphaeralcea ambigua* Dry Meadow Association

**15b.** Stands dominated by annual *Amsinckia* spp. and/or *Phacelia* spp., found on well-drained bajadas and open areas with recent or past disturbance from bioturbation (e.g., rodent burrows), grazing, and/or burning.

**G766. Californian Annual Grassland & Forb Meadow Group**

***Amsinckia menziesii* - *Amsinckia tessellata* - *Phacelia* spp.**

**Herbaceous Alliance (A4182)**

*Amsinckia tessellata* –*Erodium cicutarium* Association

**16a.** *Sphaeralcea ambigua* occurring with *Bromus rubens*, *Erodium cicutarium*, and other non-native and native herbs, often in areas that have recently burned or disturbed, and where *S. ambigua* cover and vegetation cover overall can be low or variable, depending on rainfall or time since burn.

**G311. Intermountain Semi-Desert Grassland Group**

***Sphaeralcea* (*ambigua*, *coccinea*, *parvifolia*) Dry Meadow Alliance (A4216)**

*Sphaeralcea ambigua* Dry Meadow Association

**16b.** Not as above. Herbaceous vegetation dominated by introduced herbaceous species, including *Brassica tournefortii*, *Bromus rubens*, *Bromus tectorum*, *Malcolmia africana*, *Schismus arabicus*, *S. barbatus*, or other invasive, introduced plants. *Eriogonum deflexum* or other native *Eriogonum* spp. may also be present in disturbed areas. (17)

**17a.** Stands dominated by *Bromus tectorum*.

**G600. Great Basin-Intermountain Ruderal Dry Shrubland & Grassland Group**  
***Bromus tectorum* - *Taeniatherum caput-medusae* Ruderal**  
**Annual Grassland Alliance (A1814)**  
*Bromus tectorum* Ruderal Association

**17b.** Plants not like above. (18)

**G677. North American Warm Desert Ruderal Scrub & Grassland Group**

**18a.** *Bromus rubens*, *Erodium cicutarium* and/or *Schismus* spp. dominant or co-dominant in stands with non-natives or with *Eriogonum deflexum*. Other native herbs usually occur at low cover, including *Baileya multiradiata*, *Cryptantha* spp., *Eriogonum trichopes*, *Lepidium lasiocarpum*, *Phacelia fremontii*, and *Sphaeralcea ambigua*. Typically found on alluvial fans to rocky sites, especially in disturbed areas including road-cuts and lake shores.

***Bromus rubens* - *Schismus arabicus* - *Schismus barbatus* Ruderal**  
**Herbaceous Alliance (A4121)**  
*Bromus rubens*–Mixed Forb Ruderal Association  
*Schismus (arabicus, barbatus)*–*Eriogonum (deflexum)* Ruderal Association

**18b.** *Brassica tournefortii*, *Malcolmia africana*, *Sisymbrium irio* or other mustards dominant in an herbaceous layer mostly comprised of non-natives. Usually on sandy substrates, often near road cuts or in clearings, fallow fields, large washes, riverbeds, etc.

***Brassica tournefortii* - *Malcolmia africana* Ruderal Desert Forb Alliance (A4166)**  
*Brassica tournefortii* Ruderal Association\*  
*Malcolmia africana* Ruderal Association

\* = Not currently sampled at LAKE, DEVA, MOJA, or CAMO, though included in the key since the type may occur in the region.

## Key V. Sparsely Vegetated and Non-vegetated Areas

Areas of upland landforms that may be non-vegetated or sparsely vegetated, including desert pavement on alluvial fans, sand dunes and sand flats, sandstone rock outcrops and gypsum hills with low overall cover. Herbaceous cover may vary dramatically between years depending on rainfall, particularly on sand flats, dunes, and pavements.

**Note:** Non-vegetated areas have 0% or <1% absolute cover of vascular plant vegetation while sparsely vegetated areas have an average of <2% absolute cover of vascular plant vegetation across the entire area, though cover may range from 1–9 %, depending on rainfall/temperature each year. Non-vascular plants, though, can be present and may be higher in cover.

**1a.** Substrates sandy, including sand sheets, dunes, dune aprons, and such. **(2)**

**1b.** Not as above. Substrates may include basins, rocky and gravelly hills, bajadas, washes, or flats including desert pavements. **(7)**

**2a.** Stands characterized by sparse cover of the shrub *Psoralea polydenia* or *P. fremontii*. Herbs may be present at sparse cover.

### **G541. Warm Semi-Desert Shrub & Herb Dry Wash & Colluvial Slope Group**

#### ***Psoralea fremontii* - *Psoralea polydenia* Wash Alliance (A4186)**

*Psoralea polydenia* var. *polydenia* / *Achnatherum hymenoides* Association

*Psoralea fremontii* sand dunes/flats Association (Provisional)

**2b.** Stands characterized by seasonal sparse annual or perennial herbs (including forbs and grasses) or other shrubs; or areas lacking any cover on sand dunes and sheets. **(3)**

**3a.** Stands characterized by the grasses *Achnatherum hymenoides*, *Panicum urvilleanum* or *Swallenia alexandrae*. **(4)**

**3b.** Stands characterized by annual and perennial forbs (e.g., *Dicoria canescens*, *Abronia villosa*) with seasonal rainfall, or other sand flats, dunes, and other sandy sites that lack vegetation cover. **(6)**

**4a.** Stand characterized by sparse cover of *Achnatherum hymenoides*, often on sand sheets, dune aprons, adjacent playas, and other sandy soils.

### **G311. Intermountain Semi-Desert Grassland Group**

#### ***Achnatherum hymenoides* - *Pseudoroegneria spicata* - *Muhlenbergia pungens* Grassland Alliance (A1262)**

*Achnatherum hymenoides*–*Oenothera deltoides* Dune Grassland Association

**4b.** Stands not as above. Other grasses present. **(5)**

### **G675. North American Warm Desert Dunes & Sand Flats Group**

**5a.** Stands characterized by sparse cover of the rare perennial grass, *Swallenia alexandrae*.

#### ***Dicoria canescens* - *Abronia villosa* - *Panicum urvilleanum* Dune Alliance (A4026)**

*Swallenia alexandrae* Association

**5b.** Stands characterized by sparse cover of the perennial grass, *Panicum urvilleanum*.

***Dicoria canescens* - *Abronia villosa* - *Panicum urvilleanum* Dune Alliance (A4026)**

*Panicum urvilleanum* Association

**6a.** Stands characterized a sparse to abundant cover of other perennials or annual herbs and/or shrubs.

**G675. North American Warm Desert Dunes & Sand Flats Group**

***Dicoria canescens* - *Abronia villosa* - *Panicum urvilleanum* Dune Alliance (A4026)**

*Oenothera deltoides*–*Cryptantha* spp. (provisional) Association

*Dicoria canescens* Association

*Petalonyx thurberi* Association (Provisional)

**6b.** Stands completely lacking vegetation cover on open, shifting sands.

**U002. Unconsolidated Natural Bare Areas Landform**

**Semi-Desert Dunes & Sand Flats Mapping Unit**

**7a.** Stands located on a flat or nearly flat desert playa or other similar basin floor with little if any vegetation cover.

**U002. Unconsolidated Natural Bare Areas Landform**

**Desert Playa Mapping Unit**

**7b.** Not as above. (8)

**8a.** Rocky areas with low cover of vegetation including *Ephedra viridis* as the dominant or co-dominant with plants such as *Prunus fasciculata*, *Gutierrezia* spp., and *Ericameria* spp.

**G312. Colorado Plateau Blackbrush - Mormon-tea Shrubland Group**

***Ephedra viridis* Colorado Plateau Shrubland Alliance (A3201)**

*Ephedra viridis* Association (Provisional)

**8b.** Not as above. *Ephedra viridis* not dominant or co-dominant. Stands located on cliffs, rock scree and outcrops, desert pavements, or other upland surfaces. (9)

**9a.** *Eriogonum heermannii* and/or *Buddleja utahensis* characteristically present or co-dominant with *Eriogonum fasciculatum*, *Gutierrezia* spp., and/or other plants, and often sparse in cover. Occurring on and off calcareous substrates.

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**

***Eriogonum wrightii* - *Eriogonum heermannii* - *Buddleja utahensis* Shrubland Alliance (A4167)**

(*Buddleja utahensis*–*Eriogonum heermannii*)–*Gutierrezia* spp. Association

*Eriogonum heermannii* Association (provisional)

**9b.** Not as above. (10)

**10a.** Desert washes and floodplains on sandy, gravelly, and/or other coarse-textured sediments with little or no vegetation cover, and typically with seasonal or intermittent water flow. Shrubs are typically trace in cover including wash associates such as *Brickellia* spp., *Ambrosia eriocentra*, *Eriogonum fasciculatum*, etc.

***Hymenoclea salsola* - *Bebbia juncea* Mojave-Sonoran Desert Wash Scrub Alliance**

*Ambrosia eriocentra* - *Brickellia* spp. Sparse Desert Wash Association

**10b.** Stands not like above. **(11)**

**11a.** Stands on carbonate substrates with a variety of shrubs and herbs. **(12)**

**11b.** Stands on other substrates. **(14)**

**12a.** *Amphipappus fremontii* and/or *Salvia funerea* characteristically present and sparse in cover alone or with *Pleurocoronis pluriseta*, *Viguiera reticulata*, or other shrubs on carbonate substrates, usually at mid-elevations.

**G296. Mojave Mid-Elevation Mixed Desert Scrub Group**  
***Amphipappus fremontii* - *Salvia funerea* Shrubland Alliance (A4159)**  
*Amphipappus fremontii* (limestone) Association  
*Salvia funerea* Association

**12b.** Other plants, if present, on carbonate substrates at either higher or lower elevations. **(13)**

**13a.** *Artemisia tridentata*, *Ephedra viridis*, *Linanthus pungens*, and other shrubs and herbs trace in cover at higher elevations on carbonate.

**G570. Intermountain Basins Cliff, Scree & Badland Sparse Vegetation Group**  
***Ephedra viridis* – *Chrysothamnus viscidiflorus* – *Rhus trilobata***  
**Talus Sparse Scrub Alliance (A4050)**  
Intermountain Talus Sparse Scrub (No Association Defined)

**13b.** *Agave utahensis*, *Ephedra nevadensis*, and/or other shrubs and herbs trace in cover at lower to mid-elevations.

**G569. North American Warm Semi-Desert Cliff, Scree & Pavement**  
**Sparse Vegetation Group**  
***Aloysia wrightii* - *Pericome caudata* - *Ephedra nevadensis* Sparsely**  
**Vegetated Bedrock Cliff & Lava Field Alliance (A4025)**

**14a.** Stands located on alluvial fans that have desert pavement. **(15)**

**14b.** Stands located on other surfaces with or without herbs and/or shrubs present. **(16)**

**15a.** Stands characterized by herbs such as *Chorizanthe rigida*, *Chorizanthe brevicornu*, *Chaenactis* spp., *Eriogonum* spp., and/or *Geraea canescens*, and they can be abundant in seasonally wet years or sparse in dry years.

**G569. North American Warm Semi-Desert Cliff, Scree & Pavement**  
**Sparse Vegetation Group**  
***Chorizanthe rigida* - *Geraea canescens* Desert Pavement Alliance (A4024)**  
*Chorizanthe rigida*–*Geraea canescens* Desert Pavement Association

**15b.** Stands lack vegetation (especially in dry years), and the substrate is bajada with visible desert pavement.

**U001. Consolidated Natural Bare Areas Landform**  
**Cliff, Scree & Pavement Mapping Unit**  
**Desert Pavement Mapping Unit**

**16a.** Shrubs *Atriplex hymenelytra*, *Larrea tridentata*, *Eucnide urens*, *Peucephyllum schottii*, *Pleurocoronis pluriseta*, or *Tidestromia oblongifolia* characteristically present at sparse cover on various substrates. (17)

**16b.** Not as above, other shrubs or herbs characteristically present including *Ericameria cuneata*, *Ephedra torreyana*, *Psorothamnus fremontii*, *Brickellia* spp., *Sphaeralcea ambigua*, *Chaenactis* spp., etc. (19)

**17a.** *Atriplex hymenelytra* and/or *Tidestromia oblongifolia* with sparse cover in stands with or without other species such as *Larrea tridentata*. Substrates are variable, including volcanic, calcareous, or alluvial fans, slopes and cliffs.

**G569. North American Warm Semi-Desert Cliff, Scree & Pavement  
Sparse Vegetation Group**

***Atriplex hymenelytra* Scrub Alliance (A0872)**

*Atriplex hymenelytra* Sparse Association

*Atriplex hymenelytra*–*Ambrosia dumosa* Association

*Atriplex hymenelytra*–*Larrea tridentata* Association

*Atriplex hymenelytra*–*Tidestromia oblongifolia* Association

**17b.** Not as above. (18)

**18a.** *Larrea tridentata* with sparse cover in stands, particularly in areas that have burned recently, and the herbaceous layer is also sparse and may include *Bromus rubens*.

**G295. Mojave-Sonoran Bajada & Valley Desert Scrub Group**

***Larrea tridentata* Shrubland Alliance**

*Larrea tridentata* (sparse post–burn / herbaceous) Association

**18b.** *Peucephyllum schottii*, *Pleurocoronis pluriseta*, and/or *Eucnide urens* with sparse cover in stands, as a dominant or co-dominant with other species such as *Psorothamnus fremontii*. Substrates typically are volcanic, calcareous, alluvial sideslopes and cliffs.

**G569. North American Warm Semi-Desert Cliff, Scree & Pavement  
Sparse Vegetation Group**

***Peucephyllum schottii* - *Pleurocoronis pluriseta* Scrub Alliance (A3143)**

*Peucephyllum schottii* Association

*Peucephyllum schottii*–*Eucnide urens*–*Pleurocoronis pluriseta* Association

**19a.** Stands on gypsum soils and badlands in LAKE, including sparse to open cover of herbs and shrubs, including *Arctomecon* sp., *Atriplex* spp., *Ephedra torreyana*, *Ephedra trifurca*, *Psorothamnus fremontii*, and/or others, and cryptogamic crust is often present and can be higher in cover than the vascular plants.

**G570. Intermountain Basins Cliff, Scree & Badland Sparse Vegetation Group**

***Ephedra* spp. - *Leymus salinus* - *Eriogonum corymbosum* Badlands**

**Cold Desert Sparse Vegetation Alliance (A4052)**

*Ephedra torreyana*–(*Atriplex* spp.) / Nonvascular Gypsum Sparse Association

*Psoralea fremontii* / Cryptogamic crust (Gypsum) Association  
*Ephedra trifurca* Badlands Shrubland Association\*

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

**20a.** Areas with *Sphaeralcea ambigua*, *Bromus rubens*, *Erodium cicutarium*, *Eriogonum* spp., *Lupinus* spp., *Salvia columbariae* and other herbs, often in areas that have recently burned or disturbed, and where vegetation cover is low or variable depending on rainfall or time since burn.

**G311. Intermountain Semi-Desert Grassland Group**  
***Sphaeralcea (ambigua, coccinea, parvifolia) Dry Meadow Alliance (A4216)***  
*Sphaeralcea ambigua* Dry Meadow Association

**20b. Not as above (21)**

**21a.** *Ericameria cuneata* and/or *Brickellia* spp. characteristically present and sparse in stands with other shrubs trace in cover. *Achnatherum* spp., *Elymus elymoides*, and/or other grasses often present in herbaceous layer, typically along large bedrock outcrops and colluvial slopes and at higher elevations.

**G570. Intermountain Basins Cliff, Scree & Badland Sparse Vegetation Group**  
***Ephedra viridis - Chrysothamnus viscidiflorus - Rhus trilobata***  
**Talus Sparse Scrub Alliance (A4050)**  
*Ericameria cuneata* spp. *spatulata* Association (Provisional)

**21b.** *Aloysia wrightii*, *Ephedra nevadensis*, *Ericameria linearifolia*, and/or other plants including succulents sparse in stands. Herbaceous layer sparse and may include *Camissonia* spp., *Lomatium mohavense*, *Mentzelia* spp., *Eriastrum eremicum*, *Eriogonum* spp., *Navarretia* spp., *Oxytheca perfoliata*, and *Phacelia* spp. Cryptogamic crust and lichen often higher in cover than the vascular plants, along bajadas, foothills, badlands, slopes to ridges with alluvial or colluvial sediments and typically at lower elevations.

**G569. North American Warm Semi-Desert Cliff, Scree & Pavement Sparse Vegetation Group**  
***Aloysia wrightii - Pericome caudata - Ephedra nevadensis* Sparsely Vegetated Bedrock Cliff & Lava Field Alliance (A4025) or other Alliances (undefined)\***

\* = Not currently sampled at LAKE, DEVA, MOJA, or CAMO, though included in the key since the type may occur in the region.

## **Key VI. Urban and Other Anthropogenic Features**

Areas of urban and other anthropogenic features include unnatural water impoundments and channels, planted stands of vegetation, agricultural sites, built-up sites, disturbed springs, and such. The landscapes heavily modified by human activity such as recently planted agricultural areas, residential and industrial sites, and areas cleared of vegetation that include the USNVC classes of Hortomorphic (gardens and other plantings for landscaping and aesthetic purposes) and Agromorphic (agriculture including annual row crops, vineyards, orchards, and timber plantations) vegetation.

**1a.** Area of unnatural water impoundments and other unnatural water bodies. **(2)**

**1b.** Area not of water. **(6)**

**2a.** Lake and lake edge including reservoir/reservoir edge where water is impounded. **(3)**

**2b.** Area not as above. **(4)**

**3a.** Lake/reservoir where water is present year-long.

**Lake Mapping Unit**

**3b.** Lake/reservoir edges where water fluctuates in draw-down zones yearly, and which may vary from lacking vegetation cover to having some vegetation cover in long-term draw-down.

**Lake Margin Mapping Unit**

**4a.** Water contained by earthen dams and unnatural ponds.

**Small Dammed Pond Mapping Unit**

**4b.** Water contained entirely by pavement, concrete, or by human constructed walls. **(5)**

**5a.** Water along an aqueduct, or other unnatural channel or canal.

**Aqueduct and Canal Mapping Unit**

**5b.** Water surrounded by human-constructed walls of concrete and such.

**Water Impoundment Mapping Unit**

**6a.** Urban areas that are unvegetated or a matrix of development and small patches of natural and/or human-planted vegetation. **(7)**

**Built-up & Urban Disturbance Mapping Unit**

**6b.** Human-planted vegetation for food, fiber, building materials production, landscaping, and other purposes, or escaped non-native plants that were originally planted for landscaping. **(8)**

**7a.** Area cleared by humans.

**Anthropogenic Areas of Little or No Vegetation Mapping Unit**

**7b.** Area developed and built-up by humans that may be industrial and/or residential, including mixtures of built-up areas and small natural or anthropogenic vegetated or unvegetated areas between buildings, including developed camping areas.

**Urban & Built-Up Mapping Unit**

**8a.** Area of active agriculture (i.e., planted and maintained by annual or perennial vegetation including row crops and woody agriculture).

**Agriculture Mapping Unit**

**8b.** Horticultural planting of trees not grown for food, fiber, or other products, or escaped non-native plants. **(9)**

**9a.** Stand consisting of planted and/or naturalizing *Ficus carica*.

**G510. Interior West Ruderal Riparian Forest & Scrub Group**

***Rubus armeniacus* - *Sesbania punicea* - *Ficus carica* Ruderal Riparian Scrub Alliance (A4160)**

*Ficus carica* Ruderal Shrubland Association

**9b.** Stand not as above. **(10)**

**10a.** Stand of planted and/or naturalizing tamarisk, typically *Tamarix aphylla* (athel).

**CSG043. And Temperate Tree Garden Group and CSG047. Temperate Tree Developed Vegetation Group**

**North American Desert Tree Garden Cultural Type**

*Tamarix aphylla* Planted Association

**10b.** Stand not as above. **(11)**

**11a.** Stand of planted and/or naturalizing palms of *Phoenix dactylifera* and/or *Washingtonia filifera*. **(12)**

**G510. Interior West Ruderal Riparian Forest & Scrub Group**

***Phoenix dactylifera* - *Washingtonia filifera* Ruderal Woodland Alliance (A4161)**

*Washingtonia filifera* / Spring Ruderal Woodland Association

*Phoenix dactylifera* Ruderal Woodland Association

**11b.** Stand consisting of other planted trees, shrubs, and or herbs.

**CSG043. And Temperate Tree Garden Group, CSG047. Temperate Tree Developed Vegetation Group, and**

**CGS045. Temperate Shrub & Herb Developed Vegetation Group**

**Ornamental & Non-native Trees Mapping Unit**

(Other lower level unit not defined for this project)

# Glossary of Terms Used in the Keys

The terms used in the key, and defined here, have come from various references, including from FGDC (2008), Jennings et al. (2014), and Peterson (2008).

- **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.
- **Alluvial Fan** – A body of alluvium, with or without debris flow deposits, whose surface forms a segment of a cone that radiates downslope from the point where the stream emerges from a narrow valley onto a less sloping surface. Common longitudinal profiles are gently sloping and nearly linear. Source uplands range in relief and aerial extent from mountains and plateaus to gullied terrains on hill and piedmont slopes.
- **Alluvial Flat** – A nearly level, graded, alluvial surface
- **Arroyo** – (wash) The flat-floored channel or an ephemeral stream, commonly with very steep to vertical banks cut in alluvium.
- **Calcareous** – mostly or partly composed of calcium carbonate; containing lime, chalky texture.
- **Cf.** – Compare with
- **Characteristically** – Present in >75% of the samples for that vegetation type, with no restriction on cover.
- **Co-dominant** – Must be in at least 75% of the samples, with at least 30% relative cover in all samples.
- **Coppice dune** – (Nebkha dune) Simple dunes that form around vegetation, primarily on the sand sheet. Clumps of shrubs and grass begin to gather windblown sand; as the sand gets deeper, the plants also grow taller, allowing more sand to gather around them.
- **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.
- **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
- **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.
- **Diagnostic layer** – The layer of vegetation for which the alliance is named. Typically the uppermost or dominant strata.
- **Dominant** – Must be in at least 75% of the samples, with at least 50% relative cover in all samples.
- **Dune** – a mound, ridge or hill of loose, windblown granular material (generally sand), either bare or covered with vegetation.

- **Emergent** – A plant (or vegetation layer) is considered emergent if it includes plants that rises above a predominant vegetation layer, but that are sparse in cover. It is considered as a member of the next tallest layer, but typically has an absolute cover < 10%.
- **Floodplain** – (bottomland) The nearly level alluvial plain that borders a stream and is subject to inundation under flood-stage conditions unless protected artificially. It is usually a constructional landform built of sediment deposited during overflow and lateral migration of the stream.
- **Herb** – Is any vascular plant species that has no main woody stem-development, and includes grasses, forbs, and perennial species that die-back seasonally.
- **Intermittent cover** – Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where there is 33-66 percent absolute cover.
- **Intermittently Flooded** – Substrate is usually exposed, but surface water can be present for variable periods without detectable seasonal periodicity. Inundation is not predictable to a given season and is dependent upon highly localized rain storms. This modifier was developed for use in the arid West for water regimes of Playa lakes, intermittent streams, and dry washes. This modifier can be applied to both wetland and non-wetland situations.
- **Open** – Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where the cover is less than 33 percent absolute cover.
- **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 species 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.
- **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).
- **Seasonally Flooded** – Surface water is present for extended periods during the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is very variable, extending from saturated to a water table well below the ground surface.
- **Semi-permanently Flooded** – Surface water persists throughout the growing season in most years. Land surface is normally saturated when water level drops below soil surface.
- **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.

- **Sometimes** – Present in 25 to 50% of the samples with no restriction on cover.
- **Sparse** – Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where the *average* cover value is <2% absolute cover (though the range in cover could be <1-9% cover).
- **Stand** – The basic physical unit of vegetation in a landscape. It has no set size. Some vegetation stands are very small such as wetland seeps, and some may be several square kilometers in size such as desert or forest types. A stand is defined by two main unifying characteristics:
  - It has *compositional* integrity. Throughout the site, the combination of species is similar. The stand is differentiated from adjacent stands by a discernable boundary that may be abrupt or gradual.
  - It has *structural* integrity. It has a similar history or environmental setting, affording relatively similar horizontal and vertical spacing of plant species. For example, a hillside forest formerly dominated by the same species, but that has burned on the upper part of the slope and not the lower is divided into two stands. Likewise, a sparse woodland occupying a slope with shallow rocky soils is considered a different stand from an adjacent slope of a denser woodland/forest with deep moister soil and the same species.
- **Swale** – A shallow, trough-like depression
- **Temporarily Flooded** – Surface water present for brief periods during growing season, but water table usually lies well below soil surface. Often characterizes flood-plain wetlands.
- **Terrace** – (low level) Valley floor or shoreline representing the former position of an alluvial plain, lake or shore.
- **Tree** – Is a one-stemmed woody plant that normally grows to be greater than 5 meters tall. In some cases trees may be multiple-stemmed (ramifying) after fire or other disturbance, but size of mature plants is typically greater than 5 m and undisturbed individuals of these species are usually single stemmed.
- **Usually/Often** – Present in 50 to 75% of the samples, with no restriction on cover.

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# Plant Species List for the Key

**Table 1.** Scientific and common names for taxa denoted in the keys for the LAKE, DEVA, MOJA, and CAMO vegetation classification. Taxon names are adapted from USDA-NRCS (2014).

| Scientific Name                                        | Common Name              | Life Form |
|--------------------------------------------------------|--------------------------|-----------|
| <i>Abronia villosa</i>                                 | desert sand verbena      | Herb      |
| <i>Abies concolor</i>                                  | white fir                | Tree      |
| <i>Acacia greggii</i> (= <i>Senegalia greggii</i> )    | catclaw acacia           | Shrub     |
| <i>Acamptopappus sphaerocephalus</i>                   | rayless goldenhead       | Shrub     |
| <i>Acer glabrum</i>                                    | Rocky Mountain maple     | Tree      |
| <i>Achnatherum hymenoides</i>                          | Indian ricegrass         | Herb      |
| <i>Achnatherum speciosum</i>                           | desert needlegrass       | Herb      |
| <i>Agave utahensis</i>                                 | Utah agave               | Shrub     |
| <i>Allenrolfea occidentalis</i>                        | iodinebush               | Shrub     |
| <i>Ambrosia dumosa</i>                                 | burrobush                | Shrub     |
| <i>Ambrosia eriocentra</i>                             | woolly fruit bur ragweed | Shrub     |
| <i>Ambrosia salsola</i> (= <i>Hymenoclea salsola</i> ) | cheesebush               | Shrub     |
| <i>Amphipappus fremontii</i>                           | Fremont's chaffbush      | Shrub     |
| <i>Amsinckia menziesii</i>                             | Menzies' fiddleneck      | Herb      |
| <i>Amsinckia tessellata</i>                            | bristly fiddleneck       | Herb      |
| <i>Andropogon glomeratus</i>                           | bushy bluestem           | Herb      |
| <i>Anemopsis californica</i>                           | yerba mansa              | Herb      |
| <i>Antheropeas lanosum</i>                             | white easterbonnets      | Herb      |
| <i>Anulocaulis leisolenus</i>                          | southwestern ringstem    | Herb      |
| <i>Arctomecon californica</i>                          | California bearpoppy     | Herb      |
| <i>Artemisia arbuscula</i>                             | little sagebrush         | Shrub     |
| <i>Artemisia dracunculus</i>                           | tarragon                 | Shrub     |
| <i>Artemisia nova</i>                                  | black sagebrush          | Shrub     |
| <i>Artemisia tridentata</i>                            | big sagebrush            | Shrub     |
| <i>Arundo donax</i>                                    | giant reed               | Shrub     |
| <i>Atriplex canescens</i>                              | fourwing saltbush        | Shrub     |
| <i>Atriplex confertifolia</i>                          | shadscale saltbush       | Shrub     |
| <i>Atriplex hymenelytra</i>                            | desertholly              | Shrub     |
| <i>Atriplex lentiformis</i>                            | big saltbush             | Shrub     |
| <i>Atriplex parryi</i>                                 | Parry's saltbush         | Shrub     |
| <i>Atriplex polycarpa</i>                              | cattle saltbush          | Shrub     |
| <i>Atriplex torreyi</i>                                | Torrey's saltbush        | Shrub     |
| <i>Baccharis sergiloides</i>                           | desert baccharis         | Shrub     |
| <i>Baileya multiradiata</i>                            | desert marigold          | Herb      |
| <i>Bebbia juncea</i>                                   | sweetbush                | Shrub     |

| Scientific Name                                                              | Common Name                  | Life Form |
|------------------------------------------------------------------------------|------------------------------|-----------|
| <i>Bouteloua eriopoda</i>                                                    | black grama                  | Herb      |
| <i>Bouteloua gracilis</i>                                                    | blue grama                   | Herb      |
| <i>Brassica tournefortii</i>                                                 | Asian mustard                | Herb      |
| <i>Brickellia desertorum</i>                                                 | desert brickellbush          | Shrub     |
| <i>Brickellia incana</i>                                                     | woolly brickellbush          | Shrub     |
| <i>Bromus rubens</i>                                                         | red brome                    | Herb      |
| <i>Bromus tectorum</i>                                                       | cheatgrass                   | Herb      |
| <i>Buddleja utahensis</i>                                                    | Utah butterflybush           | Shrub     |
| <i>Carex douglasii</i>                                                       | Douglas' sedge               | Herb      |
| <i>Camissonia brevipes</i>                                                   | yellow cups                  | Herb      |
| <i>Ceanothus greggii</i>                                                     | desert ceanothus             | Shrub     |
| <i>Celtis laevigata</i> var. <i>reticulata</i> (= <i>Celtis reticulata</i> ) | netleaf hackberry            | Shrub     |
| <i>Cercocarpus intricatus</i>                                                | littleleaf mountain mahogany | Shrub     |
| <i>Cercocarpus ledifolius</i>                                                | curl-leaf mountain mahogany  | Shrub     |
| <i>Chaenactis</i> spp.                                                       | pincushion                   | Herb      |
| <i>Chilopsis linearis</i>                                                    | desert willow                | Tree      |
| <i>Chorizanthe brevicornu</i>                                                | brittle spineflower          | Herb      |
| <i>Chorizanthe rigida</i>                                                    | devil's spineflower          | Herb      |
| <i>Chrysothamnus viscidiflorus</i>                                           | yellow rabbitbrush           | Shrub     |
| <i>Cladium californicum</i>                                                  | California sawgrass          | Herb      |
| <i>Coleogyne ramosissima</i>                                                 | blackbrush                   | Shrub     |
| <i>Croton californicus</i>                                                   | California croton            | Herb      |
| <i>Cryptantha</i> spp.                                                       | cryptantha                   | Herb      |
| <i>Cylindropuntia acanthocarpa</i>                                           | buckhorn cholla              | Shrub     |
| <i>Cylindropuntia bigelovii</i>                                              | teddybear cholla             | Shrub     |
| <i>Cylindropuntia ramosissima</i>                                            | branched pencil cholla       | Shrub     |
| <i>Dedeckera eurekaensis</i>                                                 | July gold                    | Shrub     |
| <i>Dicoria canescens</i>                                                     | desert twinbugs              | Herb      |
| <i>Distichlis spicata</i>                                                    | saltgrass                    | Herb      |
| <i>Dithyrea californica</i>                                                  | California shieldpod         | herb      |
| <i>Echinocactus polycephalus</i>                                             | cottontop cactus             | Shrub     |
| <i>Eleocharis rostellata</i>                                                 | beaked spikerush             | Herb      |
| <i>Encelia actoni</i>                                                        | Acton's brittlebush          | Shrub     |
| <i>Encelia farinosa</i>                                                      | brittlebush                  | Shrub     |
| <i>Encelia resinifera</i>                                                    | sticky brittlebush           | Shrub     |
| <i>Encelia virginensis</i>                                                   | Virgin River brittlebush     | Shrub     |
| <i>Enceliopsis argophylla</i>                                                | silverleaf sunray            | Herb      |
| <i>Ephedra californica</i>                                                   | California jointfir          | Shrub     |
| <i>Ephedra funerea</i>                                                       | Death Valley jointfir        | Shrub     |

| Scientific Name                                        | Common Name          | Life Form |
|--------------------------------------------------------|----------------------|-----------|
| <i>Ephedra nevadensis</i>                              | Nevada jointfir      | Shrub     |
| <i>Ephedra torreyana</i>                               | Torrey's jointfir    | Shrub     |
| <i>Ephedra trifurca</i>                                | longleaf jointfir    | Shrub     |
| <i>Ephedra viridis</i>                                 | Mormon tea           | Shrub     |
| <i>Ericameria cooperi</i>                              | Cooper's goldenbush  | Shrub     |
| <i>Ericameria cuneata</i>                              | cliff goldenbush     | Shrub     |
| <i>Ericameria discoidea</i>                            | whitestem goldenbush | Shrub     |
| <i>Ericameria nauseosa</i>                             | rubber rabbitbrush   | Shrub     |
| <i>Ericameria paniculata</i>                           | Mojave rabbitbrush   | Shrub     |
| <i>Ericameria teretifolia</i>                          | green rabbitbrush    | Shrub     |
| <i>Eriogonum deflexum</i>                              | flatcrown buckwheat  | Herb      |
| <i>Eriogonum fasciculatum</i>                          | California buckwheat | Shrub     |
| <i>Eriogonum heermannii</i>                            | Heerman's buckwheat  | Shrub     |
| <i>Eriogonum inflatum</i>                              | desert trumpet       | Herb      |
| <i>Eriogonum trichopes</i>                             | little deserttrumpet | Herb      |
| <i>Eriogonum wrightii</i>                              | bastardsage          | Shrub     |
| <i>Erodium cicutarium</i>                              | redstem stork's bill | Herb      |
| <i>Eschscholzia</i> spp.                               | eschscholzia         | Herb      |
| <i>Eucnide urens</i>                                   | desert stingbush     | Shrub     |
| <i>Fallugia paradoxa</i>                               | apache plume         | Shrub     |
| <i>Ferocactus cylindraceus</i>                         | barrel cactus        | Shrub     |
| <i>Ficus carica</i>                                    | edible fig           | Shrub     |
| <i>Forestiera pubescens</i>                            | stretchberry         | Shrub     |
| <i>Fouquieria splendens</i>                            | ocotilla             | Shrub     |
| <i>Garrya flavescens</i>                               | ashy silktassel      | Shrub     |
| <i>Geraea canescens</i>                                | desert sunflower     | Herb      |
| <i>Grayia spinosa</i>                                  | spiny hopsage        | Shrub     |
| <i>Grusonia parishii</i>                               | matted cholla        | Shrub     |
| <i>Gutierrezia microcephala</i>                        | threadleaf snakeweed | Shrub     |
| <i>Gutierrezia sarothrae</i>                           | broom snakeweed      | Shrub     |
| <i>Hecastocleis shockleyi</i>                          | prickleleaf          | Shrub     |
| <i>Heliotropium curassavicum</i>                       | salt heliotrope      | Herb      |
| <i>Hirschfeldia incana</i>                             | shortpod mustard     | Herb      |
| <i>Hymenoclea salsola</i> (= <i>Ambrosia salsola</i> ) | cheesebush           | Shrub     |
| <i>Hyptis emoryi</i>                                   | desert lavender      | Shrub     |
| <i>Isocoma acradenia</i>                               | alkali goldenbush    | Shrub     |
| <i>Juncus arcticus</i> var. <i>littoralis</i>          | arctic rush          | Herb      |
| <i>Juncus cooperi</i>                                  | Cooper's rush        | Herb      |
| <i>Juncus mexicanus</i>                                | Mexican rush         | Herb      |

| Scientific Name                  | Common Name               | Life Form |
|----------------------------------|---------------------------|-----------|
| <i>Juniperus californica</i>     | California juniper        | Tree      |
| <i>Juniperus grandis</i>         | Sierra juniper            | Tree      |
| <i>Juniperus osteosperma</i>     | Utah juniper              | Tree      |
| <i>Keckiella antirrhinoides</i>  | snapdragon penstemon      | Shrub     |
| <i>Krameria erecta</i>           | littleleaf ratany         | Shrub     |
| <i>Krameria grayi</i>            | white ratany              | Shrub     |
| <i>Krascheninnikovia lanata</i>  | winterfat                 | Shrub     |
| <i>Larrea tridentata</i>         | creosotebush              | Shrub     |
| <i>Lepidospartum latisquamum</i> | Nevada broomsage          | Shrub     |
| <i>Lepidium fremontii</i>        | desert pepperweed         | Herb      |
| <i>Lepidium lasiocarpum</i>      | shaggyfruit pepperweed    | Herb      |
| <i>Leymus cinereus</i>           | basin wildrye             | Herb      |
| <i>Lupinus</i> spp.              | lupine                    | Herb      |
| <i>Lycium andersonii</i>         | water jacket              | Shrub     |
| <i>Lycium cooperi</i>            | peach thorn               | Shrub     |
| <i>Malacothrix glabrata</i>      | smooth desertdandelion    | Herb      |
| <i>Malcolmia africana</i>        | African mustard           | Herb      |
| <i>Menodora spinescens</i>       | spiny menodora            | Shrub     |
| <i>Mirabilis laevis</i>          | desert wishbone-bush      | Shrub     |
| <i>Mortonia utahensis</i>        | Utah mortonia             | Shrub     |
| <i>Muhlenbergia porteri</i>      | bush muhly                | Herb      |
| <i>Muhlenbergia utilis</i>       | aparejoggrass             | Herb      |
| <i>Nitrophila occidentalis</i>   | boraxweed                 | Herb      |
| <i>Nolina bigelovii</i>          | Bigelow's nolina          | Shrub     |
| <i>Oenothera deltoides</i>       | birdcage evening primrose | Herb      |
| <i>Opuntia basilaris</i>         | beavertail pricklypear    | Shrub     |
| <i>Palafoxia arida</i>           | desert palafox            | Herb      |
| <i>Panicum urvilleanum</i>       | desert panicgrass         | Herb      |
| <i>Parkinsonia aculeata</i>      | Jerusalem thorn           | Tree      |
| <i>Parkinsonia microphylla</i>   | yellow paloverde          | Tree      |
| <i>Pectocarya</i> spp.           | combseed                  | Herb      |
| <i>Petalonyx</i> spp.            | sandpaper plant           | Herb      |
| <i>Petalonyx thurberi</i>        | Thurber's sandpaper plant | Herb      |
| <i>Peucephyllum schottii</i>     | Schott's pygmycedar       | Shrub     |
| <i>Phacelia fremontii</i>        | Fremont's phacelia        | Herb      |
| <i>Phacelia pulchella</i>        | beautiful phacelia        | Herb      |
| <i>Phragmites australis</i>      | common reed               | Herb      |
| <i>Phoenix dactylifera</i>       | date palm                 | Tree      |
| <i>Picrothamnus desertorum</i>   | bud sagebrush             | Shrub     |

| Scientific Name                                                                 | Common Name             | Life Form |
|---------------------------------------------------------------------------------|-------------------------|-----------|
| <i>Pinus edulis</i>                                                             | twoneedle pinyon        | Tree      |
| <i>Pinus flexilis</i>                                                           | limber pine             | Tree      |
| <i>Pinus longaeva</i>                                                           | bristlecone pine        | Tree      |
| <i>Pinus monophylla</i>                                                         | singleleaf pinyon       | Tree      |
| <i>Plantago ovata</i>                                                           | desert Indianwheat      | Herb      |
| <i>Pleuraphis jamesii</i>                                                       | James' galleta          | Herb      |
| <i>Pleuraphis rigida</i>                                                        | galleta grass           | Herb      |
| <i>Pleurocoronis pluriseta</i>                                                  | desert arrowleaf        | Shrub     |
| <i>Pluchea sericea</i>                                                          | arrowweed               | Shrub     |
| <i>Populus fremontii</i>                                                        | Fremont cottonwood      | Tree      |
| <i>Prosopis glandulosa</i>                                                      | honey mesquite          | Tree      |
| <i>Prosopis pubescens</i>                                                       | screwbean mesquite      | Tree      |
| <i>Prunus eremophila</i>                                                        | Mojave Desert plum      | Shrub     |
| <i>Prunus fasciculata</i>                                                       | desert almond           | Shrub     |
| <i>Psorothamnus arborescens</i>                                                 | Mojave indigobush       | Shrub     |
| <i>Psorothamnus emoryi</i>                                                      | dyebush                 | Shrub     |
| <i>Psorothamnus fremontii</i>                                                   | Fremont's dalea         | Shrub     |
| <i>Psorothamnus polydenius</i>                                                  | Nevada dalea            | Shrub     |
| <i>Psorothamnus spinosus</i>                                                    | smoketree               | Tree      |
| <i>Purshia stansburiana</i>                                                     | Stansbury cliffrose     | Shrub     |
| <i>Purshia tridentata</i>                                                       | antelope bitterbrush    | Shrub     |
| <i>Purshia tridentata</i> var. <i>glandulosa</i> (= <i>Purshia glandulosa</i> ) | desert bitterbrush      | Shrub     |
| <i>Quercus chrysolepis</i>                                                      | canyon live oak         | Tree      |
| <i>Quercus turbinella</i>                                                       | scrub live oak          | Tree      |
| <i>Rhamnus ilicifolia</i>                                                       | hollyleaf redberry      | Shrub     |
| <i>Rhus trilobata</i>                                                           | skunkbush sumac         | Shrub     |
| <i>Ribes cereum</i>                                                             | wax currant             | Shrub     |
| <i>Ribes montigenum</i>                                                         | gooseberry currant      | Shrub     |
| <i>Ribes velutinum</i>                                                          | desert gooseberry       | Shrub     |
| <i>Rosa woodsii</i>                                                             | Woods' rose             | Shrub     |
| <i>Salazaria mexicana</i>                                                       | Mexican bladdersage     | Shrub     |
| <i>Salix exigua</i>                                                             | narrowleaf willow       | Shrub     |
| <i>Salix gooddingii</i>                                                         | black willow            | Tree      |
| <i>Salix laevigata</i>                                                          | red willow              | Shrub     |
| <i>Salix lasiolepis</i>                                                         | arroyo willow           | Shrub     |
| <i>Salsola</i> spp.                                                             | Russian thistle         | Herb      |
| <i>Salsola tragus</i>                                                           | prickly Russian thistle | Herb      |
| <i>Salazaria mexicana</i>                                                       | Mexican bladdersage     | Shrub     |
| <i>Salvia columbariae</i>                                                       | chia                    | Herb      |

| Scientific Name                  | Common Name                | Life Form    |
|----------------------------------|----------------------------|--------------|
| <i>Salvia dorrii</i>             | purple sage                | Shrub        |
| <i>Salvia funerea</i>            | woolly sage                | Shrub        |
| <i>Sarcobatus vermiculatus</i>   | greasewood                 | Shrub        |
| <i>Schismus arabicus</i>         | Arabian schismus           | Herb         |
| <i>Schismus barbatus</i>         | common Mediterranean grass | Herb         |
| <i>Schoenoplectus americanus</i> | chairmaker's bulrush       | Herb         |
| <i>Schoenus nigricans</i>        | black bogrush              | Herb         |
| <i>Scleropogon brevifolius</i>   | burrograss                 | Herb         |
| <i>Scopulophila rixfordii</i>    | Rixford's rockwort         | Herb         |
| <i>Senna armata</i>              | desertsenna                | Shrub        |
| <i>Solidago confinis</i>         | Yellow Butterfly Weed      | Herb         |
| <i>Solidago spectabilis</i>      | Nevada goldenrod           | Herb         |
| <i>Sphaeralcea ambigua</i>       | desert mallow              | Herb         |
| <i>Sporobolus airoides</i>       | alkali sacaton             | Herb         |
| <i>Sporobolus cryptandrus</i>    | sand dropseed              | Herb         |
| <i>Suaeda moquinii</i>           | Mojave seablight           | Shrub        |
| <i>Swallenia alexandrae</i>      | Eureka dunegrass           | Herb         |
| <i>Sisymbrium irio</i>           | London rocket              | Herb         |
| <i>Tamarix aphylla</i>           | Athel tamarisk             | Tree         |
| <i>Tamarix ramosissima</i>       | saltcedar                  | Tree         |
| <i>Tamarix</i> spp.              | tamarisk                   | Tree         |
| <i>Thamnosma montana</i>         | turpentine broom           | Shrub        |
| <i>Tidestromia oblongifolia</i>  | woolly tidestromia         | Shrub        |
| <i>Typha angustifolia</i>        | narrowleaf cattail         | Herb         |
| <i>Typha domingensis</i>         | southern cattail           | Herb         |
| <i>Typha latifolia</i>           | broadleaf cattail          | Herb         |
| <i>Viguiera reticulata</i>       | netvein goldeneye          | Shrub        |
| <i>Viguiera parishii</i>         | Parish's goldeneye         | Shrub        |
| <i>Vitis arizonica</i>           | canyon grape               | Shrub (vine) |
| <i>Vitis girdiana</i>            | desert wild grape          | Shrub (vine) |
| <i>Vulpia octoflora</i>          | sixweeks fescue            | Herb         |
| <i>Washingtonia filifera</i>     | California fan palm        | Tree         |
| <i>Yucca baccata</i>             | banana yucca               | Shrub        |
| <i>Yucca brevifolia</i>          | Joshua tree                | Tree         |
| <i>Yucca schidigera</i>          | Mojave yucca               | Shrub        |

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