

## Ecological site R038XA104AZ Granitic Hills 12-16" p.z.

Accessed: 02/17/2025

### General information

**Provisional.** A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

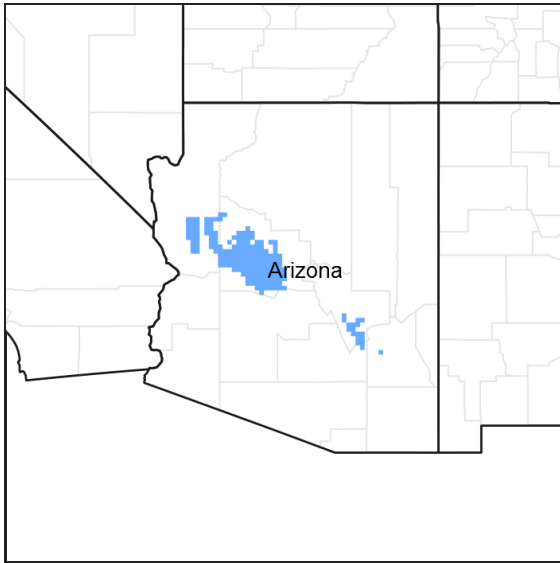


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

### MLRA notes

Major Land Resource Area (MLRA): 038X–Mogollon Transition South

AZ 38.1 – Lower Mogollon Transition

Elevations range from 3000 to 4500 feet and precipitation averages 12 to 16 inches per year. Vegetation includes canotia, one-seed juniper, mesquite, catclaw acacia, jojoba, turbinella oak, ratany, shrubby buckwheat, algerita, skunkbush, tobosa, vine mesquite, bottlebrush squirreltail, grama species, curly mesquite, desert needlegrass and New Mexico feathergrass. The soil temperature regime is thermic and the soil moisture regime is ustic aridic. This unit occurs within the Transition Zone Physiographic Province and is characterized by canyons and structural troughs or valleys. Igneous, metamorphic and sedimentary rock classes occur on rough mountainous terrain in association with less extensive sediment filled valleys exhibiting little integrated drainage.

### Classification relationships

This site is similar to TE Site # 365 on the Prescott National Forest.

### Associated sites

|             |                             |
|-------------|-----------------------------|
| R038XA105AZ | Limestone Hills 12-16" p.z. |
|-------------|-----------------------------|

|             |   |
|-------------|---|
| R038XA117AZ | <b>Volcanic Hills 12-16" p.z. Clayey</b>            |
| R038XA134AZ | <b>Granitic/Schist Hills 12-16" p.z. Paralithic</b> |
| R038XA135AZ | <b>Diabase Hills 12-16" p.z.</b>                    |

### Similar sites

|             |                                   |
|-------------|-----------------------------------|
| R041XC306AZ | <b>Shallow Hills 12-16" p.z.</b>  |
| R038XB204AZ | <b>Granitic Hills 16-20" p.z.</b> |
| R040XA105AZ | <b>Shallow Hills 10"-13" p.z.</b> |

**Table 1. Dominant plant species**

|            |  |
|------------|--|
| Tree       | (1) <i>Parkinsonia microphylla</i>                                   |
| Shrub      | (1) <i>Simmondsia chinensis</i><br>(2) <i>eriogonum fasciculatum</i> |
| Herbaceous | (1) <i>aristida</i><br>(2) <i>achnatherum speciosum</i>              |

### Physiographic features

This site occurs at the lowest elevations of the interior chaparral zone in the Mogollon Transition area. This site occurs in an upland position. It occurs on hill-slopes, ridge-tops and mountains.

**Table 2. Representative physiographic features**

|                    |   |
|--------------------|---|
| Landforms          | (1) Hill<br>(2) Mountain slope<br>(3) Ridge |
| Flooding frequency | None  |
| Elevation          | 3,100–4,600 ft                              |
| Slope              | 15–65%                                      |
| Aspect             | N, E, S                                     |

### Climatic features

Precipitation in this common resource area averages 12 to 16 inches annually. The winter-summer rainfall ratio ranges from about 60/40% in the northwest part of the area to 50/50% in the southeast part. Summer rains fall July through September; are from high-intensity, convective thunderstorms. This moisture originates primarily from the Gulf of Mexico, but can come from the remnants of Pacific hurricanes in September. Winter moisture is frontal, originates in the north Pacific, and falls as rain or snow in widespread storms of low intensity and long duration. Snowfall ranges from a trace to 10 inches per year and can occur from November through March. Snow seldom persists for more than a day except on north aspects. May and June are the driest months of the year. Humidity is generally low all year. Average annual air temperatures range from 59 to 70 degrees F (thermic temperature regime). Daytime temperatures in the summer are commonly in the high 90's. Freezing temperatures are common from October through April, usually during the night or early morning hours. The actual precipitation, available moisture and temperature vary, depending on, region, elevation, rain shadow effect and aspect.

**Table 3. Representative climatic features**

|                               |          |
|-------------------------------|----------|
| Frost-free period (average)   | 230 days |
| Freeze-free period (average)  | 285 days |
| Precipitation total (average) | 16 in    |

## Influencing water features

There are no water features associated with this site.

## Soil features

These soils are shallow (10 to 20 inches) and dark colored. They are loamy textured, non-calcareous and well drained. These soils range from lacking any development to thin argillic horizons. They have formed in residuum and colluvium from granite, rhyolite, gneiss and related conglomerates. Soil surfaces are well covered by light colored gravels, cobbles and/or stones. The effective rooting depth is limited by slightly weathered bedrock at 10 to 20 inches. Runoff is moderate to high on moist soils. The erosion hazard is slight due to gravel, cobble and rock covers. Rock outcrop and can be as high as 15%.

Soils mapped to date on this site include: SSA-627 Mohave County Southern Part MU's Cellar-25 & 27, Lampshire-74 & 107, Romero-106 & 107, Chiricahua-106; SSA-637 Yavapai County Western Part MU's Barkerville-BmF, BnD, BoF, Moano-AxD, MgD, MkF, MoD, MrC; SSA-639 Black-Hills Sedona Area MU Lampshire-445; SSA-675 San Carlos Indian Reservation MU's Oracle-670 & 671, Romero-670 & 671; SSA-697 Mohave County Central Part MU's Chiricahua-129, Lampshire-130, Romero-129 & 130; SSA-645 Aquila-Carefree Area MU Cellar-16.

Table 4. Representative soil features

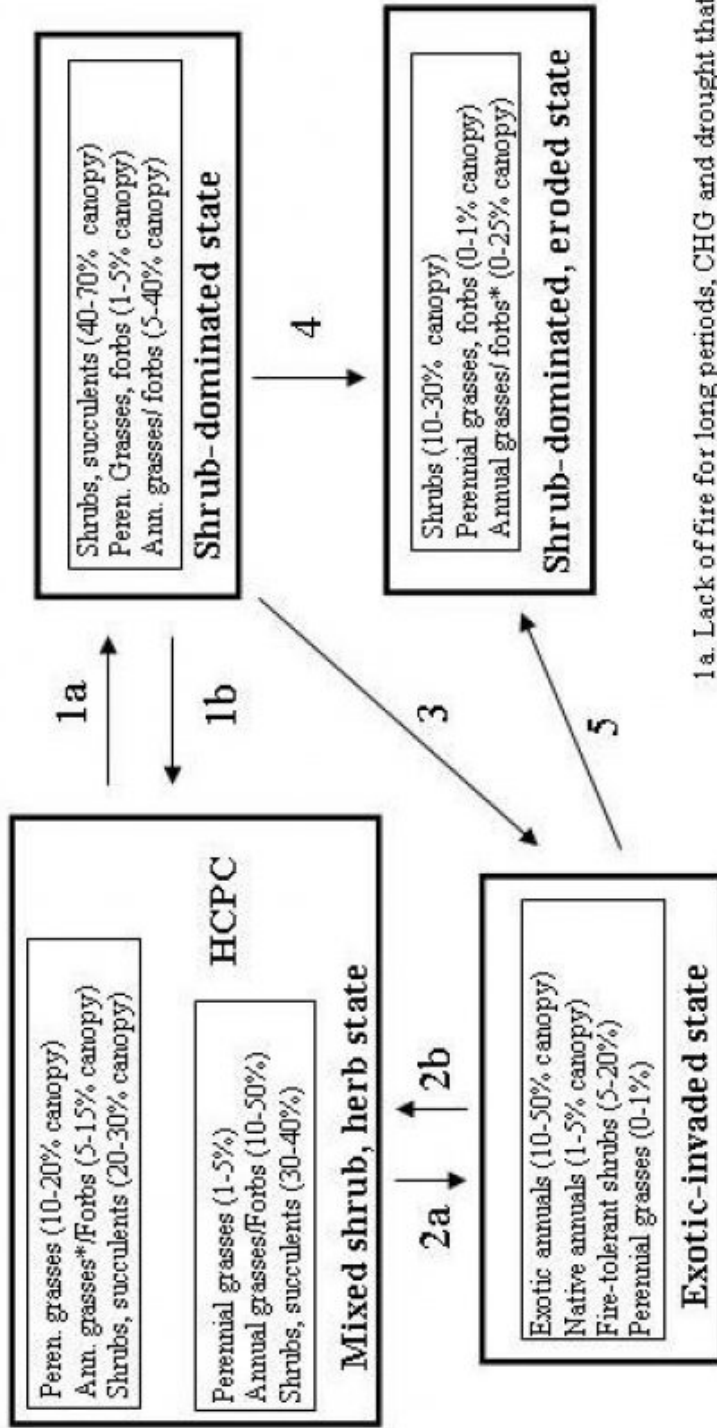
|  |   |
|--|---|
| Surface texture  | (1) Very gravelly loam<br>(2) Very gravelly sandy loam<br>(3) Gravelly sandy loam |
| Family particle size                                     | (1) Loamy   |
| Drainage class   | Well drained  |
| Permeability class                                       | Moderate to moderately slow   |
| Soil depth   | 10–20 in  |
| Surface fragment cover <=3"                              | 25–50%  |
| Surface fragment cover >3"                               | 1–15%   |
| Available water capacity<br>(0-40in)                     | 0.8–2.2 in  |
| Calcium carbonate equivalent<br>(0-40in)                 | 0–5%  |
| Electrical conductivity<br>(0-40in)                      | 0–2 mmhos/cm  |
| Sodium adsorption ratio<br>(0-40in)                      | 0–2   |
| Soil reaction (1:1 water)<br>(0-40in)                    | 6.8–7.6   |
| Subsurface fragment volume <=3"<br>(Depth not specified) | 10–35%  |
| Subsurface fragment volume >3"<br>(Depth not specified)  | 0–10%   |

## Ecological dynamics

The historic native plant community is a diverse mixture of desert trees, shrubs, succulents, forbs and grasses. This includes a diverse flora of native annual grasses and forbs of both the winter and summer seasons. Periodic wildfires occurred at moderate intervals (15 to 30 years) and helped maintain a balance between herbs and shrubs. In the absence of fire for longer periods, shrubby species and cacti can become dominant. The interactions of drought, fire and continuous livestock grazing can, over time, result in the loss of palatable grasses, half shrubs and suffrutescent forbs. In some situations non-native annuals can dominate the site. These species can, over time, diminish the soil seed-bank of native annual species. Non-native annuals can act to increase the fire frequency of areas of the site near roads and urban areas, where the incidence of man-made fires is high.

State and transition model

MLRA 38-1 (12-16''), Granitic Hills



1a. Lack of fire for long periods, CHG and drought that reduced fuel loads.

1b. Unknown, possible herbicide followed by prescribed fire as maintenance.

2a. Introduction of seed source of exotic annuals like red brome, wild oats plus increased fire frequency (every 5-10 years)

2b. Unknown

3. Introduction of seed source of exotic annuals, El Nino type event, catastrophic fire.

4, 5. Accelerated soil erosion may occur where vegetation is absent. Repeated fires may remove most perennial vegetation.

Slopes are trailed, soils are compacted and till erosion occurs.

\* Annual grasses include natives and non-natives

Figure 4. State and Transition, Granitic Hills 12-16" p.z.

**State 1**  
**Mixed Shrub-Grass State**

**Community 1.1**  
**Historic Climax Plant Community**

The historic, native, plant community is a diverse mixture of perennial grasses, suffrutescent forbs, shrubs, succulents and desert trees. A rich flora of native annual forbs and grasses, of both the winter and summer seasons, exist in the plant community. Periodic, naturally occurring, wildfires were important in maintaining the potential plant community. North slopes have a chaparral of evergreen shrubs like jojoba, turbinella oak and flatop buckwheat. Southern exposures will have a higher percentage of desert shrubs, trees and succulents in the plant community. More xeric grasses will dominate southern exposures (aristida, tanglehead). Grasses on cooler aspects include desert stipa and sideoats grama.

Table 5. Annual production by plant type

| Plant Type      | Low (Lb/Acre) | Representative Value (Lb/Acre) | High (Lb/Acre) |
|-----------------|---------------|--------------------------------|----------------|
| Grass/Grasslike | 110           | 300                            | 690            |
| Shrub/Vine      | 210           | 350                            | 630            |
| Forb            | 10            | 50                             | 200            |
| Tree            | 5             | 20                             | 100            |
| <b>Total</b>    | <b>335</b>    | <b>720</b>                     | <b>1620</b>    |

Table 6. Soil surface cover

|                                   |        |
|-----------------------------------|--------|
| Tree basal cover                  | 0-1%   |
| Shrub/vine/liana basal cover      | 1-2%   |
| Grass/grasslike basal cover       | 2-5%   |
| Forb basal cover                  | 1-2%   |
| Non-vascular plants               | 0%     |
| Biological crusts                 | 0-1%   |
| Litter                            | 20-50% |
| Surface fragments >0.25" and <=3" | 25-50% |
| Surface fragments >3"             | 1-15%  |
| Bedrock                           | 1-15%  |
| Water                             | 0%     |
| Bare ground                       | 10-50% |

Table 7. Canopy structure (% cover)

| Height Above Ground (Ft) | Tree | Shrub/Vine | Grass/<br>Grasslike | Forb  |
|--------------------------|------|------------|---------------------|-------|
| <0.5                     | –    | 1-5%       | 0-10%               | 1-10% |
| >0.5 <= 1                | –    | 5-10%      | 1-10%               | 1-5%  |
| >1 <= 2                  | –    | 5-10%      | 1-5%                | 0-5%  |
| >2 <= 4.5                | –    | 5-10%      | 0-2%                | 0-1%  |
| >4.5 <= 13               | 1-5% | 1-5%       | –                   | –     |
| >13 <= 40                | 0-2% | –          | –                   | –     |
| >40 <= 80                | –    | –          | –                   | –     |
| >80 <= 120               | –    | –          | –                   | –     |
| >120                     | –    | –          | –                   | –     |

Figure 6. Plant community growth curve (percent production by month). AZ3811, 38.1 12-16" p.z. all sites. Growth begins in the spring, most growth occurs in the summer..

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0   | 0   | 1   | 7   | 15  | 20  | 22  | 20  | 10  | 5   | 0   | 0   |

## State 2 Shrub Dominated State

### Community 2.1 Shrub Dominated Plant Community

Perennial grass canopy cover is reduced due to the interactions of drought, grazing and fire. Desert shrubs and cacti dominate the plant community. Shrub cover exceeds 40%. Annuals, both native and non-native, dominate the under-story. Fire frequency is reduced but the site can still burn, especially after "El Nino" years produce heavy fuel loads of annual grasses and forbs.

## State 3 Shrub Dominated and Eroded State

### Community 3.1 Shrub Dominated and Eroded Plant Community

Shrubs like jojoba, paloverde, mesquite, mimosa and ocotillo and succulents like prickly pear, cholla and banana yucca can increase to dominate the site in the absence of fire for very long periods of time. Native and non-native annual forbs and grasses dominate the under-story. In "El Nino" years, herbaceous fuels can be sufficient to carry fire through the heavy canopy of shrubs. The major woody shrubs are, however, fire resistant once established. Such fires would remove less tolerant species like cacti and leave intact the sprouting woody plants to become more and more dominant. Extreme rainfall events coupled with; the fire, drought and grazing interaction, can lead to rilling of steep slopes. Compaction of soils can occur with heavy trailing from continuous livestock use. Loss of plant cover after repeated fire can lead to accelerated rill erosion under these circumstances.

## State 4 Exotic forb and grass invaded state

### Community 4.1 Exotic Annuals Invaded Plant Community

Non-native annual grasses and forbs like; red brome, cheatgrass and wild oats, can invade and dominate areas of the site. These species can, over time, reduce the seed-bank of native annual grasses and forbs. Their presence can increase the fire frequency (of man made fires) especially where roads and urban areas are adjacent to areas

of the site. Repeated fires tend to remove fire sensitive species like paloverde, cacti and buckwheat, and leave fire tolerant species like turbinella oak, mesquite, whitethorn and jojoba.

## Additional community tables

Table 8. Community 1.1 plant community composition

| Group                  | Common Name                       | Symbol | Scientific Name                         | Annual Production (Lb/Acre) | Foliar Cover (%) |
|------------------------|-----------------------------------|--------|---|-----------------------------|------------------|
| <b>Grass/Grasslike</b> |                                   |        |   |                             |                  |
| 1                      | <b>Dominant perennial grasses</b> |        |   | 70–350                      |                  |
|                        | sideoats grama                    | BOCU   | <i>Bouteloua curtipendula</i>           | 30–100                      | –                |
|                        | black grama                       | BOER4  | <i>Bouteloua eriopoda</i>               | 10–60                       | –                |
|                        | slender grama                     | BORE2  | <i>Bouteloua repens</i>                 | 5–50                        | –                |
|                        | tanglehead                        | HECO10 | <i>Heteropogon contortus</i>            | 5–50                        | –                |
|                        | bush muhly                        | MUPO2  | <i>Muhlenbergia porteri</i>             | 5–50                        | –                |
|                        | purple threeawn                   | ARPU9  | <i>Aristida purpurea</i>                | 1–50                        | –                |
|                        | Parish's threeawn                 | ARPUP5 | <i>Aristida purpurea var. parishii</i>  | 1–30                        | –                |
|                        | cane bluestem                     | BOBA3  | <i>Bothriochloa barbinodis</i>          | 1–30                        | –                |
|                        | Arizona cottontop                 | DICA8  | <i>Digitaria californica</i>            | 1–30                        | –                |
| 2                      | <b>Cool season grasses</b>        |        |   | 10–100                      |                  |
|                        | desert needlegrass                | ACSP12 | <i>Achnatherum speciosum</i>            | 10–100                      | –                |
|                        | squirreltail                      | ELEL5  | <i>Elymus elymoides</i>                 | 0–20                        | –                |
|                        | prairie Junegrass                 | KOMA   | <i>Koeleria macrantha</i>               | 0–20                        | –                |
|                        | New Mexico feathergrass           | HENE5  | <i>Hesperostipa neomexicana</i>         | 0–10                        | –                |
|                        | needle and thread                 | HECO26 | <i>Hesperostipa comata</i>              | 0–5                         | –                |
| 3                      | <b>Misc. perennial grasses</b>    |        |   | 10–100                      |                  |
|                        | big galleta                       | PLRI3  | <i>Pleuraphis rigida</i>                | 0–25                        | –                |
|                        | hairy grama                       | BOHI2  | <i>Bouteloua hirsuta</i>                | 0–20                        | –                |
|                        | plains lovegrass                  | ERIN   | <i>Eragrostis intermedia</i>            | 0–15                        | –                |
|                        | spidergrass                       | ARTE3  | <i>Aristida ternipes</i>                | 0–15                        | –                |
|                        | spidergrass                       | ARTEG  | <i>Aristida ternipes var. gentilis</i>  | 0–15                        | –                |
|                        | Hall's panicgrass                 | PAHA   | <i>Panicum hallii</i>                   | 0–10                        | –                |
|                        | curly-mesquite                    | HIBE   | <i>Hilaria belangeri</i>                | 0–10                        | –                |
|                        | green sprangletop                 | LEDU   | <i>Leptochloa dubia</i>                 | 0–10                        | –                |
|                        | southwestern bristlegrass         | SESC2  | <i>Setaria scheelei</i>                 | 0–5                         | –                |
|                        | plains bristlegrass               | SEVU2  | <i>Setaria vulpiseta</i>                | 0–5                         | –                |
|                        | sand dropseed                     | SPCR   | <i>Sporobolus cryptandrus</i>           | 0–5                         | –                |
|                        | tobosagrass                       | PLMU3  | <i>Pleuraphis mutica</i>                | 0–5                         | –                |
|                        | Fendler threeawn                  | ARPUL  | <i>Aristida purpurea var. longiseta</i> | 0–5                         | –                |
|                        | blue threeawn                     | ARPUN  | <i>Aristida purpurea var. nealleyi</i>  | 0–5                         | –                |
|                        | red grama                         | BOTR2  | <i>Bouteloua trifida</i>                | 0–1                         | –                |
|                        | low woollygrass                   | DAPU7  | <i>Dasyochloa pulchella</i>             | 0–1                         | –                |
|                        | nineawn pappusgrass               | ENDE   | <i>Enneapogon desvauxii</i>             | 0–1                         | –                |
|                        | slim tridens                      | TRMU   | <i>Tridens muticus</i>                  | 0–1                         | –                |
|                        | slim tridens                      | TRMUE  | <i>Tridens muticus var. elongatus</i>   | 0–1                         | –                |
|                        | bullgrass                         | MIIFM  | <i>Muhlenbergia emerslevii</i>          | 0–1                         | –                |

|             |                           |        |   |       |   |
|-------------|---------------------------|--------|---|-------|---|
|             | vine mesquite             | PAOB   | <i>Panicum obtusum</i>                      | 0-1   | - |
|             | Texas bluestem            | SCCI2  | <i>Schizachyrium cirratum</i>               | 0-1   | - |
| 4           | <b>Annual grasses</b>     |        |   | 5-150 |   |
|             | sixweeks threeawn         | ARAD   | <i>Aristida adscensionis</i>                | 1-30  | - |
|             | mucronate sprangletop     | LEPAB  | <i>Leptochloa panicea ssp. brachiata</i>    | 1-25  | - |
|             | Mexican panicgrass        | PAHI5  | <i>Panicum hirticaule</i>                   | 0-20  | - |
|             | Arizona signalgrass       | URAR   | <i>Urochloa arizonica</i>                   | 1-20  | - |
|             | small fescue              | VUMI   | <i>Vulpia microstachys</i>                  | 1-20  | - |
|             | Eastwood fescue           | VUMIC  | <i>Vulpia microstachys var. ciliata</i>     | 1-20  | - |
|             | sixweeks fescue           | VUOC   | <i>Vulpia octoflora</i>                     | 1-20  | - |
|             | prairie threeawn          | AROL   | <i>Aristida oligantha</i>                   | 0-10  | - |
|             | needle grama              | BOAR   | <i>Bouteloua aristidoides</i>               | 0-5   | - |
|             | Rothrock's grama          | BORO2  | <i>Bouteloua rothrockii</i>                 | 0-5   | - |
|             | Arizona brome             | BRAR4  | <i>Bromus arizonicus</i>                    | 0-2   | - |
|             | delicate muhly            | MUFR   | <i>Muhlenbergia fragilis</i>                | 0-2   | - |
|             | littleseed muhly          | MUMI   | <i>Muhlenbergia microsperma</i>             | 0-2   | - |
|             | witchgrass                | PACA6  | <i>Panicum capillare</i>                    | 0-1   | - |
|             | Bigelow's bluegrass       | POBI   | <i>Poa bigelovii</i>                        | 0-1   | - |
|             | feather fingergrass       | CHVI4  | <i>Chloris virgata</i>                      | 0-1   | - |
|             | canyon cupgrass           | ERLE7  | <i>Eriochloa lemmonii</i>                   | 0-1   | - |
|             | tufted lovegrass          | ERPE   | <i>Eragrostis pectinacea</i>                | 0-1   | - |
|             | desert lovegrass          | ERPEM  | <i>Eragrostis pectinacea var. miserrima</i> | 0-1   | - |
|             | little barley             | HOPU   | <i>Hordeum pusillum</i>                     | 0-1   | - |
|             | Mexican sprangletop       | LEFUU  | <i>Leptochloa fusca ssp. uninervia</i>      | 0-1   | - |
|             | sixweeks grama            | BOBA2  | <i>Bouteloua barbata</i>                    | 0-1   | - |
| <b>Forb</b> |                           |        |   |       |   |
| 5           | <b>Perennial forbs</b>    |        |   | 5-50  |   |
|             | shrubby deervetch         | LORI3  | <i>Lotus rigidus</i>                        | 1-20  | - |
|             | slender janusia           | JAGR   | <i>Janusia gracilis</i>                     | 1-15  | - |
|             | spikemoss                 | SELAG  | <i>Selaginella</i>                          | 1-15  | - |
|             | white sagebrush           | ARLUM2 | <i>Artemisia ludoviciana ssp. mexicana</i>  | 0-10  | - |
|             | climbing wartclub         | BOSC   | <i>Boerhavia scandens</i>                   | 0-5   | - |
|             | perennial rockcress       | ARPE2  | <i>Arabis perennans</i>                     | 1-5   | - |
|             | wealeaf bur ragweed       | AMCO3  | <i>Ambrosia confertiflora</i>               | 1-5   | - |
|             | southwestern mock vervain | GLGO   | <i>Glandularia gooddingii</i>               | 0-5   | - |
|             | lipfern                   | CHEIL  | <i>Cheilanthes</i>                          | 0-5   | - |
|             | bluedicks                 | DICA14 | <i>Dichelostemma capitatum</i>              | 0-5   | - |
|             | Coues' cassia             | SECO10 | <i>Senna covesii</i>                        | 0-5   | - |
|             | slender poreleaf          | POGR5  | <i>Porophyllum gracile</i>                  | 0-5   | - |
|             | lacy tansyaster           | MAPI   | <i>Machaeranthera pinnatifida</i>           | 0-5   | - |
|             | plains blackfoot          | MELE2  | <i>Melampodium leucanthum</i>               | 0-5   | - |
|             | wishbone-bush             | MILAV  | <i>Mirabilis laevis var. villosa</i>        | 1-5   | - |
|             | cliffbrake                | PELLA  | <i>Pellaea</i>                              | 0-5   | - |



|                              |        |  |     |   |
|------------------------------|--------|--|-----|---|
| Parry's beardtongue          | PEPA24 | <i>Penstemon parryi</i>                    | 0-5 | - |
| desert penstemon             | PEPS   | <i>Penstemon pseudospectabilis</i>         | 0-5 | - |
| desert globemallow           | SPAM2  | <i>Sphaeralcea ambigua</i>                 | 0-5 | - |
| brownplume wirelettuce       | STPA4  | <i>Stephanomeria pauciflora</i>            | 1-5 | - |
| sego lily                    | CANU3  | <i>Calochortus nuttallii</i>               | 0-2 | - |
| desert trumpet               | ERIN4  | <i>Eriogonum inflatum</i>                  | 0-2 | - |
| desert rosemallow            | HICO   | <i>Hibiscus coulteri</i>                   | 0-2 | - |
| paleface                     | HIDE   | <i>Hibiscus denudatus</i>                  | 0-1 | - |
| Indian rushpea               | HOGL2  | <i>Hoffmannseggia glauca</i>               | 0-1 | - |
| ragged nettlespurge          | JAMA   | <i>Jatropha macrorhiza</i>                 | 0-1 | - |
| longflower tube tongue       | JULO3  | <i>Justicia longii</i>                     | 0-1 | - |
| Wright's deervetch           | LOWR   | <i>Lotus wrightii</i>                      | 0-1 | - |
| Parry's false prairie-clover | MAPA7  | <i>Marina parryi</i>                       | 0-1 | - |
| Mojave spurge                | EUSC6  | <i>Euphorbia schizoloba</i>                | 0-1 | - |
| fleabane                     | ERIGE2 | <i>Erigeron</i>                            | 0-1 | - |
| Cooley's bundleflower        | DECO2  | <i>Desmanthus cooleyi</i>                  | 0-1 | - |
| desert larkspur              | DEPA   | <i>Delphinium parishii</i>                 | 0-1 | - |
| tall mountain larkspur       | DESC   | <i>Delphinium scaposum</i>                 | 0-1 | - |
| tuber anemone                | ANTU   | <i>Anemone tuberosa</i>                    | 0-1 | - |
| narrowleaf silverbush        | ARLA12 | <i>Argythamnia lanceolata</i>              | 0-1 | - |
| white sagebrush              | ARLU   | <i>Artemisia ludoviciana</i>               | 0-1 | - |
| dwarf desertpeony            | ACNA2  | <i>Acourtia nana</i>                       | 0-1 | - |
| brownfoot                    | ACWR5  | <i>Acourtia wrightii</i>                   | 0-1 | - |
| San Felipe dogweed           | ADPO   | <i>Adenophyllum porophylloides</i>         | 0-1 | - |
| trailing windmills           | ALIN   | <i>Allionia incarnata</i>                  | 0-1 | - |
| largeflower onion            | ALMA4  | <i>Allium macropetalum</i>                 | 0-1 | - |
| dense ayenia                 | AYMI   | <i>Ayenia microphylla</i>                  | 0-1 | - |
| desert marigold              | BAMU   | <i>Baileya multiradiata</i>                | 0-1 | - |
| scarlet spiderling           | BOCO   | <i>Boerhavia coccinea</i>                  | 0-1 | - |
| wavyleaf Indian paintbrush   | CAAPM  | <i>Castilleja applegatei ssp. martinii</i> | 0-1 | - |
| Arizona wrightwort           | CAAR7  | <i>Carlownrightia arizonica</i>            | 0-1 | - |
| New Mexico silverbush        | ARNE2  | <i>Argythamnia neomexicana</i>             | 0-1 | - |
| Lemmon's ragwort             | SELE8  | <i>Senecio lemmonii</i>                    | 0-1 | - |
| silverleaf nightshade        | SOEL   | <i>Solanum elaeagnifolium</i>              | 0-1 | - |
| glandleaf milkwort           | POMA7  | <i>Polygala macradenia</i>                 | 0-1 | - |
| canaigre dock                | RUHY   | <i>Rumex hymenosepalus</i>                 | 0-1 | - |
| twinleaf senna               | SEBA3  | <i>Senna bauhinioides</i>                  | 0-1 | - |
| orange fameflower            | PHAU13 | <i>Phemeranthus aurantiacus</i>            | 0-1 | - |
| desert tobacco               | NIOB   | <i>Nicotiana obtusifolia</i>               | 0-1 | - |
| New Mexico groundsel         | PANE7  | <i>Packera neomexicana</i>                 | 0-1 | - |
| Oak Creek ragwort            | PAQU8  | <i>Packera quercetorum</i>                 | 0-1 | - |
| toadflax penstemon           | PELI2  | <i>Penstemon linarioides</i>               | 0-1 | - |
| turpentinebroom              | THMO   | <i>Thamnosma montana</i>                   | 0-1 | - |
| branched noseburn            | TRRA5  | <i>Tragia ramosa</i>                       | 0-1 | - |

|   |                             |        |   |       |   |
|---|-----------------------------|--------|---|-------|---|
|   | Louisiana vetch             | VILUL2 | <i>Vicia ludoviciana ssp. ludoviciana</i>     | 0–1   | – |
| 6 | <b>Annual forbs</b>         |        |   | 5–150 |   |
|   | bristly fiddleneck          | AMTE3  | <i>Amsinckia tessellata</i>                   | 0–25  | – |
|   | pitseed goosefoot           | CHBE4  | <i>Chenopodium berlandieri</i>                | 0–25  | – |
|   | California poppy            | ESCAM  | <i>Eschscholzia californica ssp. mexicana</i> | 0–25  | – |
|   | western tansymustard        | DEPI   | <i>Descurainia pinnata</i>                    | 0–20  | – |
|   | Coulter's lupine            | LUSP2  | <i>Lupinus sparsiflorus</i>                   | 0–20  | – |
|   | phacelia                    | PHACE  | <i>Phacelia</i>                               | 0–15  | – |
|   | exserted Indian paintbrush  | CAEXE  | <i>Castilleja exserta ssp. exserta</i>        | 0–15  | – |
|   | Coulter's spiderling        | BOCO2  | <i>Boerhavia coulteri</i>                     | 0–15  | – |
|   | slender goldenweed          | MAGR10 | <i>Machaeranthera gracilis</i>                | 0–10  | – |
|   | tanseyleaf tansyaster       | MATA2  | <i>Machaeranthera tanacetifolia</i>           | 0–10  | – |
|   | longleaf false goldeneye    | HELOA2 | <i>Helimeris longifolia var. annua</i>        | 0–10  | – |
|   | Arizona poppy               | KAGR   | <i>Kallstroemia grandiflora</i>               | 0–5   | – |
|   | flatcrown buckwheat         | ERDE6  | <i>Eriogonum deflexum</i>                     | 0–5   | – |
|   | combseed                    | PECTO  | <i>Pectocarya</i>                             | 0–5   | – |
|   | shaggyfruit pepperweed      | LELA   | <i>Lepidium lasiocarpum</i>                   | 0–5   | – |
|   | foothill deervetch          | LOHU2  | <i>Lotus humistratus</i>                      | 0–5   | – |
|   | coastal bird's-foot trefoil | LOSA   | <i>Lotus salsuginosus</i>                     | 0–5   | – |
|   | Arizona lupine              | LUAR4  | <i>Lupinus arizonicus</i>                     | 0–5   | – |
|   | thelypody                   | THELY  | <i>Thelypodium</i>                            | 0–5   | – |
|   | woolly tidestromia          | TILA2  | <i>Tidestromia lanuginosa</i>                 | 0–5   | – |
|   | desert Indianwheat          | PLOV   | <i>Plantago ovata</i>                         | 1–5   | – |
|   | woolly plantain             | PLPA2  | <i>Plantago patagonica</i>                    | 0–5   | – |
|   | fiwewing spiderling         | BOIN   | <i>Boerhavia intermedia</i>                   | 0–5   | – |
|   | milkvetch                   | ASTRA  | <i>Astragalus</i>                             | 0–5   | – |
|   | miner's lettuce             | CLPEP  | <i>Claytonia perfoliata ssp. perfoliata</i>   | 0–5   | – |
|   | cryptantha                  | CRYPT  | <i>Cryptantha</i>                             | 0–2   | – |
|   | purslane                    | PORTU  | <i>Portulaca</i>                              | 0–2   | – |
|   | New Mexico plumeseed        | RANE   | <i>Rafinesquia neomexicana</i>                | 0–2   | – |
|   | Arizona popcornflower       | PLAR   | <i>Plagiobothrys arizonicus</i>               | 0–2   | – |
|   | sleepy silene               | SIAN2  | <i>Silene antirrhina</i>                      | 0–2   | – |
|   | sand fringe pod             | THCU   | <i>Thysanocarpus curvipes</i>                 | 0–2   | – |
|   | miniature lupine            | LUBI   | <i>Lupinus bicolor</i>                        | 0–2   | – |
|   | Thurber's pepperweed        | LETH2  | <i>Lepidium thurberi</i>                      | 0–2   | – |
|   | New Mexico thistle          | CINE   | <i>Cirsium neomexicanum</i>                   | 0–2   | – |
|   | Gordon's bladderpod         | LEGO   | <i>Lesquerella gordonii</i>                   | 0–2   | – |
|   | miniature woollystar        | ERDI2  | <i>Eriastrum diffusum</i>                     | 0–2   | – |
|   | spreading fleabane          | ERDI4  | <i>Erigeron divergens</i>                     | 0–2   | – |
|   | sorrel buckwheat            | ERPO4  | <i>Eriogonum polycladon</i>                   | 0–2   | – |
|   | wedgeleaf draba             | DRCU   | <i>Draba cuneifolia</i>                       | 0–2   | – |
|   | American wild carrot        | DAPU3  | <i>Daucus pusillus</i>                        | 0–2   | – |
|   | spurge                      | EUPHO  | <i>Euphorbia</i>                              | 0–2   | – |

|                   |                             |        |   |         |   |
|-------------------|-----------------------------|--------|---|---------|---|
|                   | crestrub morning-glory      | IPCO2  | <i>Ipomoea costellata</i>                               | 0–2     | – |
|                   | redstar                     | IPCO3  | <i>Ipomoea coccinea</i>                                 | 0–1     | – |
|                   | ivyleaf morning-glory       | IPHE   | <i>Ipomoea hederacea</i>                                | 0–1     | – |
|                   | star gilia                  | GIST   | <i>Gilia stellata</i>                                   | 0–1     | – |
|                   | California goldfields       | LACA7  | <i>Lasthenia californica</i>                            | 0–1     | – |
|                   | sacred thorn-apple          | DAWR2  | <i>Datura wrightii</i>                                  | 0–1     | – |
|                   | Texas stork's bill          | ERTE13 | <i>Erodium texanum</i>                                  | 0–1     | – |
|                   | manybristle chinchweed      | PEPA2  | <i>Pectis papposa</i>                                   | 0–1     | – |
|                   | Fendler's desertdandelion   | MAFE   | <i>Malacothrix fendleri</i>                             | 0–1     | – |
|                   | whitestem blazingstar       | MEAL6  | <i>Mentzelia albicaulis</i>                             | 0–1     | – |
|                   | green carpetweed            | MOVE   | <i>Mollugo verticillata</i>                             | 0–1     | – |
|                   | desert evening primrose     | OEPR   | <i>Oenothera primiveris</i>                             | 0–1     | – |
|                   | Florida pellitory           | PAFL3  | <i>Parietaria floridana</i>                             | 0–1     | – |
|                   | lyreleaf jewelflower        | STCA5  | <i>Streptanthus carinatus</i>                           | 0–1     | – |
|                   | woollyhead neststraw        | STMI2  | <i>Stylocline micropoides</i>                           | 0–1     | – |
|                   | creamcups                   | PLCA5  | <i>Platystemon californicus</i>                         | 0–1     | – |
|                   | chia                        | SACO6  | <i>Salvia columbariae</i>                               | 0–1     | – |
|                   | sawtooth sage               | SASU7  | <i>Salvia subincisa</i>                                 | 0–1     | – |
|                   | ragwort                     | SENEC  | <i>Senecio</i>  | 0–1     | – |
|                   | spreading fanpetals         | SIAB   | <i>Sida abutilifolia</i>                                | 0–1     | – |
|                   | desert unicorn-plant        | PRAL4  | <i>Proboscidea althaeifolia</i>                         | 0–1     | – |
|                   | doubleclaw                  | PRPA2  | <i>Proboscidea parviflora</i>                           | 0–1     | – |
|                   | hairy prairie clover        | DAMO   | <i>Dalea mollis</i>                                     | 0–1     | – |
|                   | scrambled eggs              | COAU2  | <i>Corydalis aurea</i>                                  | 0–1     | – |
|                   | yellow tackstem             | CAPA7  | <i>Calycoseris parryi</i>                               | 0–1     | – |
|                   | white tackstem              | CAWR   | <i>Calycoseris wrightii</i>                             | 0–1     | – |
|                   | brittle spineflower         | CHBR   | <i>Chorizanthe brevicornu</i>                           | 0–1     | – |
|                   | Esteve's pincushion         | CHST   | <i>Chaenactis stevioides</i>                            | 0–1     | – |
|                   | hoary bowlesia              | BOIN3  | <i>Bowlesia incana</i>                                  | 0–1     | – |
|                   | annual agoseris             | AGHE2  | <i>Agoseris heterophylla</i>                            | 0–1     | – |
|                   | carelessweed                | AMPA   | <i>Amaranthus palmeri</i>                               | 0–1     | – |
| <b>Shrub/Vine</b> |                             |        |   |         |   |
| 7                 | <b>Evergreen shrubs</b>     |        |   | 150–300 |   |
|                   | jojoba                      | SICH   | <i>Simmondsia chinensis</i>                             | 100–250 | – |
|                   | Sonoran scrub oak           | QUTU2  | <i>Quercus turbinella</i>                               | 0–150   | – |
|                   | desert ceanothus            | CEGR   | <i>Ceanothus greggii</i>                                | 0–50    | – |
|                   | alderleaf mountain mahogany | CEMOM4 | <i>Cercocarpus montanus</i> var. <i>montanus</i>        | 0–30    | – |
|                   | hairy mountain mahogany     | CEMOP  | <i>Cercocarpus montanus</i> var. <i>paucidentatus</i>   | 0–10    | – |
|                   | algerita                    | MATR3  | <i>Mahonia trifoliolata</i>                             | 0–10    | – |
|                   | snapdragon penstemon        | KEANM  | <i>Keckiella antirrhinoides</i> ssp. <i>microphylla</i> | 0–5     | – |
|                   | red barberry                | MAHA4  | <i>Mahonia haematocarpa</i>                             | 0–5     | – |
|                   | sugar sumac                 | RHOV   | <i>Rhus ovata</i>                                       | 0–5     | – |

|   |                              |        |   |        |   |
|---|------------------------------|--------|---|--------|---|
|   | redberry buckthorn           | RHCR   | <i>Rhamnus crocea</i>                       | 0–2    | – |
|   | Wright's silktassel          | GAWR3  | <i>Garrya wrightii</i>                      | 0–2    | – |
|   | pointleaf manzanita          | ARPU5  | <i>Arctostaphylos pungens</i>               | 0–2    | – |
| 8 | <b>Large shrubs</b>          |        |   | 15–60  |   |
|   | ocotillo                     | FOSP2  | <i>Fouquieria splendens</i>                 | 1–20   | – |
|   | catclaw mimosa               | MIACB  | <i>Mimosa aculeaticarpa var. biuncifera</i> | 0–10   | – |
|   | catclaw acacia               | ACGR   | <i>Acacia greggii</i>                       | 1–10   | – |
|   | Wright's beebrush            | ALWR   | <i>Aloysia wrightii</i>                     | 0–10   | – |
|   | desert sweet                 | CHMI2  | <i>Chamaebatiaria millefolium</i>           | 0–5    | – |
|   | skunkbush sumac              | RHTR   | <i>Rhus trilobata</i>                       | 0–5    | – |
|   | Berlandier's wolfberry       | LYBE   | <i>Lycium berlandieri</i>                   | 1–5    | – |
|   | Arizona desert-thorn         | LYEX   | <i>Lycium exsertum</i>                      | 0–5    | – |
|   | Florida hopbush              | DOVI   | <i>Dodonaea viscosa</i>                     | 0–2    | – |
|   | Mexican bladdersage          | SAME   | <i>Salazaria mexicana</i>                   | 0–2    | – |
|   | Arizona necklacepod          | SOAR3  | <i>Sophora arizonica</i>                    | 0–2    | – |
|   | spiny hackberry              | CEEH   | <i>Celtis ehrenbergiana</i>                 | 0–2    | – |
|   | whitethorn acacia            | ACCO2  | <i>Acacia constricta</i>                    | 0–2    | – |
|   | Warnock's snakewood          | COWA   | <i>Condalia warnockii</i>                   | 0–1    | – |
|   | ambrosia leaf bur ragweed    | AMAM2  | <i>Ambrosia ambrosioides</i>                | 0–1    | – |
|   | Thurber's desert honeysuckle | ANTH2  | <i>Anisacanthus thurberi</i>                | 0–1    | – |
|   | fourwing saltbush            | ATCA2  | <i>Atriplex canescens</i>                   | 0–1    | – |
|   | desertbroom                  | BASA2  | <i>Baccharis sarothroides</i>               | 0–1    | – |
|   | California brickellbush      | BRCA3  | <i>Brickellia californica</i>               | 0–1    | – |
|   | lotebush                     | ZIOBC  | <i>Ziziphus obtusifolia var. canescens</i>  | 0–1    | – |
|   | mariola                      | PAIN2  | <i>Parthenium incanum</i>                   | 0–1    | – |
|   | littleleaf sumac             | RHMI3  | <i>Rhus microphylla</i>                     | 0–1    | – |
|   | pale desert-thorn            | LYPA   | <i>Lycium pallidum</i>                      | 0–1    | – |
|   | winterfat                    | KRLA2  | <i>Krascheninnikovia lanata</i>             | 0–1    | – |
|   | creosote bush                | LATR2  | <i>Larrea tridentata</i>                    | 0–1    | – |
| 9 | <b>Dominant half shrubs</b>  |        |   | 35–150 |   |
|   | fairyduster                  | CAER   | <i>Calliandra eriophylla</i>                | 15–50  | – |
|   | Eastern Mojave buckwheat     | ERFA2  | <i>Eriogonum fasciculatum</i>               | 5–50   | – |
|   | bastardsage                  | ERWR   | <i>Eriogonum wrightii</i>                   | 5–50   | – |
|   | littleleaf ratany            | KRER   | <i>Krameria erecta</i>                      | 5–15   | – |
|   | Gregg's prairie clover       | DAGR2  | <i>Dalea greggii</i>                        | 0–15   | – |
|   | Parish's goldeneye           | VIPA14 | <i>Viguiera parishii</i>                    | 0–10   | – |
|   | rough menodora               | MESC   | <i>Menodora scabra</i>                      | 0–10   | – |
|   | longleaf phlox               | PHLO2  | <i>Phlox longifolia</i>                     | 0–5    | – |
|   | American threefold           | TRCA8  | <i>Trixis californica</i>                   | 0–5    | – |
|   | Coulter's brickellbush       | BRCO   | <i>Brickellia coulteri</i>                  | 0–5    | – |
|   | pelotazo                     | ABIN   | <i>Abutilon incanum</i>                     | 0–5    | – |
|   | ragged rockflower            | CRBI2  | <i>Crossosoma bigelovii</i>                 | 0–2    | – |
|   | starry bedstraw              | GAST   | <i>Galium stellatum</i>                     | 0–1    | – |

|             |                              |        |   |       |   |
|-------------|------------------------------|--------|---|-------|---|
|             | starry baccharis             | SIAC1  | <i>Baccharis strobilata</i>                   | 0-1   | - |
|             | desert zinnia                | ZIAC   | <i>Zinnia acerosa</i>                         | 0-1   | - |
|             | shortleaf baccharis          | BABR   | <i>Baccharis brachyphylla</i>                 | 0-1   | - |
|             | yerba de pasmo               | BAPT   | <i>Baccharis pteronioides</i>                 | 0-1   | - |
|             | sweetbush                    | BEJU   | <i>Bebbia juncea</i>                          | 0-1   | - |
| 10          | <b>Succulents</b>            |        |   | 5-70  |   |
|             | banana yucca                 | YUBA   | <i>Yucca baccata</i>                          | 1-20  | - |
|             | cactus apple                 | OPEN3  | <i>Opuntia engelmannii</i>                    | 5-15  | - |
|             | buck-horn cholla             | CYAC8  | <i>Cylindropuntia acanthocarpa</i>            | 0-15  | - |
|             | tulip pricklypear            | OPPH   | <i>Opuntia phaeacantha</i>                    | 1-10  | - |
|             | sacahuista                   | NOMI   | <i>Nolina microcarpa</i>                      | 0-10  | - |
|             | saguaro                      | CAGI10 | <i>Carnegiea gigantea</i>                     | 0-5   | - |
|             | common sotol                 | DAWH2  | <i>Dasyliion wheeleri</i>                     | 1-5   | - |
|             | walkingstick cactus          | CYSP8  | <i>Cylindropuntia spinosior</i>               | 0-2   | - |
|             | goldenflower century plant   | AGCH2  | <i>Agave chrysantha</i>                       | 0-2   | - |
|             | Palmer's century plant       | AGPA3  | <i>Agave palmeri</i>                          | 0-2   | - |
|             | dollarjoint pricklypear      | OPCH   | <i>Opuntia chlorotica</i>                     | 0-2   | - |
|             | candy barrelcactus           | FEWI   | <i>Ferocactus wislizeni</i>                   | 0-2   | - |
|             | Graham's nipple cactus       | MAGR9  | <i>Mammillaria grahamii</i>                   | 0-1   | - |
|             | soaptree yucca               | YUEL   | <i>Yucca elata</i>                            | 0-1   | - |
|             | Schott's century plant       | AGSC3  | <i>Agave schottii</i>                         | 0-1   | - |
|             | teddybear cholla             | CYBI9  | <i>Cylindropuntia bigelovii</i>               | 0-1   | - |
|             | jumping cholla               | CYFU10 | <i>Cylindropuntia fulgida</i>                 | 0-1   | - |
|             | Christmas cactus             | CYLE8  | <i>Cylindropuntia leptocaulis</i>             | 0-1   | - |
|             | Whipple cholla               | CYWH   | <i>Cylindropuntia whipplei</i>                | 0-1   | - |
|             | pinkflower hedgehog cactus   | ECBO2  | <i>Echinocereus bonkeriae</i>                 | 0-1   | - |
|             | Arizona hedgehog cactus      | ECCOA  | <i>Echinocereus coccineus var. arizonicus</i> | 0-1   | - |
|             | Engelmann's hedgehog cactus  | ECEN   | <i>Echinocereus engelmannii</i>               | 0-1   | - |
|             | redspine fishhook cactus     | ECER2  | <i>Echinomastus erectocentrus</i>             | 0-1   | - |
|             | pinkflower hedgehog cactus   | ECFA   | <i>Echinocereus fasciculatus</i>              | 0-1   | - |
|             | spiny star                   | ESVI2  | <i>Escobaria vivipara</i>                     | 0-1   | - |
| 11          | <b>Increaser half-shrubs</b> |        |   | 1-50  |   |
|             | broom snakeweed              | GUSA2  | <i>Gutierrezia sarothrae</i>                  | 1-20  | - |
|             | turpentine bush              | ERLA12 | <i>Ericameria laricifolia</i>                 | 0-10  | - |
|             | narrowleaf goldenbush        | ERLI6  | <i>Ericameria linearifolia</i>                | 0-5   | - |
|             | brittlebush                  | ENFA   | <i>Encelia farinosa</i>                       | 0-5   | - |
|             | button brittlebush           | ENFR   | <i>Encelia frutescens</i>                     | 0-5   | - |
|             | threadleaf snakeweed         | GUMI   | <i>Gutierrezia microcephala</i>               | 0-1   | - |
|             | burroweed                    | ISTE2  | <i>Isocoma tenuisecta</i>                     | 0-1   | - |
| <b>Tree</b> |                              |        |   |       |   |
| 12          | <b>Trees</b>                 |        |   | 5-100 |   |
|             | crucifixion thorn            | CAHO3  | <i>Canotia holacantha</i>                     | 0-20  | - |

|  |                        |        |   |      |   |
|--|------------------------|--------|---|------|---|
|  | redberry juniper       | JUCO11 | <i>Juniperus coahuilensis</i>             | 0–15 | – |
|  | oneseed juniper        | JUMO   | <i>Juniperus monosperma</i>               | 0–15 | – |
|  | yellow paloverde       | PAMI5  | <i>Parkinsonia microphylla</i>            | 1–15 | – |
|  | western honey mesquite | PRGLT  | <i>Prosopis glandulosa var. torreyana</i> | 0–5  | – |
|  | velvet mesquite        | PRVE   | <i>Prosopis velutina</i>                  | 0–5  | – |
|  | blue paloverde         | PAFL6  | <i>Parkinsonia florida</i>                | 0–5  | – |

## Animal community

This site is suitable for grazing year round, but is not easily traversed by livestock. Livestock grazing use is concentrated on south slopes, canyon bottoms and ridge-tops. North slopes may be little used. Slopes greater than 50% and areas with very cobbly surfaces limit grazing use by cattle. Areas of rock outcrop can form barriers to livestock movement. The site is susceptible to erosion in overgrazed areas like bed-grounds, livestock trails and lower slopes adjacent to water.

The site has good habitat diversity for a great variety of desert wildlife species. Water developments are very important to both livestock and wildlife on this site.

## Hydrological functions

This site has rough surfaces, due to a high cover of gravels, cobbles and stones, which act to hold water on the site. When the soils are dry, it produces little runoff. It produces significant runoff only when heavy rain falls on snow or moist soils.

## Recreational uses

Hunting, camping, horseback riding, backpacking, rock hounding, photography.

## Wood products

Limited harvest of fuel-wood, fence posts and stays from mesquite, juniper and saguaro.

## Other products

There is some native harvest of food plants like grass nuts, thistle, prickly pear tunas, jojoba nuts and mescal. There is some harvest of herbs like herbaceous sage, tarragon and deer weed.

## Type locality

|                               |  |
|-------------------------------|--|
| Location 1: Graham County, AZ |  |
| Township/Range/Section        | T8S R22E S6                              |
| General legal description     | Eureka Springs Ranch, near Cedar Springs |

## Contributors

Dan Robinett  
Larry D. Ellicott

## Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

|   |                   |
|---|-------------------|
| Author(s)/participant(s)                    |                   |
| Contact for lead author                     |                   |
| Date  |                   |
| Approved by                                 |                   |
| Approval date                               |                   |
| Composition (Indicators 10 and 12) based on | Annual Production |

## Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant:

Sub-dominant:

Other:

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**
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14. **Average percent litter cover (%) and depth ( in):**
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**
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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**
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17. **Perennial plant reproductive capability:**
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