

Ecological site R030XB213AZ Gypsum Upland 6-9" p.z. Alkaline

Accessed: 05/03/2024

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.

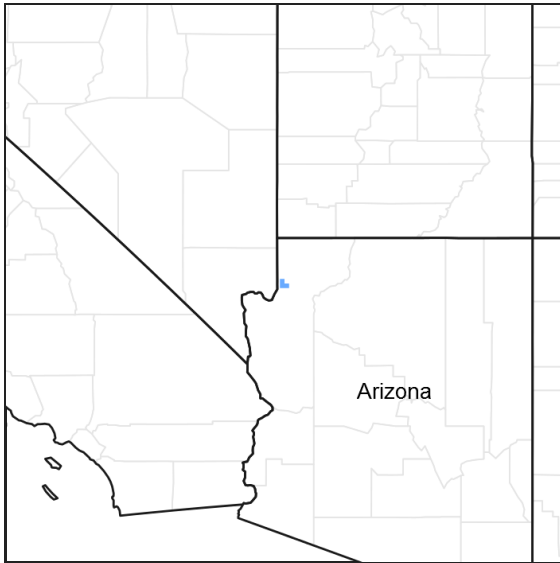


Figure 1. Mapped extent

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): 030X–Mojave Basin and Range

AZ CRA 30.2 – Middle Mohave Desert

Elevations range from 1500 to 3200 feet and precipitation averages 6 to 9 inches per year. Vegetation includes creosotebush, white bursage, yucca, prickly pear and cholla species, Mormon tea, flattop buckwheat, ratany, winterfat, bush muhly, threeawns, and big galleta. The soil temperature regime is thermic and the soil moisture regime is typic aridic. This unit occurs within the Basin and Range Province and is characterized by broad basins, valleys, and old lakebeds. Widely spaced mountains trending north to south occur throughout the area. Isolated, short mountain ranges are separated by an aggraded desert plain. The mountains are fault blocks that have been tilted up. Long alluvial fans coalesce with dry lakebeds between some of the ranges.

Table 1. Dominant plant species

| | |
|------------|--|
| Tree | Not specified |
| Shrub | (1) <i>Atriplex confertifolia</i> (2) <i>Ephedra nevadensis</i> |
| Herbaceous | Not specified |

Physiographic features

The ecological site occurs in an upland position on pediments with naturally occurring sinuous drainages and washes. The higher areas do not benefit from run-on moisture, while the drainages receive some benefit. The site occurs on all aspects.

Table 2. Representative physiographic features

| | |
|--------------------|---|
| Landforms | (1) Pediment (2) Drainageway (3) Wash |
| Flooding frequency | None |
| Ponding frequency | None |
| Elevation | 488–914 m |
| Slope | 2–15% |
| Aspect | Aspect is not a significant factor |

Climatic features

The climate is arid and warm. Annual precipitation ranges from 6 to 9 inches. About 65 percent of the rainfall comes from October through May as gentle rain from Pacific storms which may last for a couple of days. The rest of the rainfall comes during the summer monsoon season from July through September as spotty, brief, intense thunderstorms. Snow rarely falls, and only remains on the ground a few hours at most. Annual air temperature ranges from 59 to 70 degrees F. The average frost-free period ranges from 156 to 259 days.

Table 3. Representative climatic features

| | |
|-------------------------------|----------|
| Frost-free period (average) | 259 days |
| Freeze-free period (average) | 290 days |
| Precipitation total (average) | 229 mm |

Influencing water features

Soil features

The soil of this ecological site is moderately deep. The surface texture of the soil is fine to very fine sandy loam. Subsoil textures of the soil are sand, loamy sand, and sandy loam, sometimes channery (gypsite). The soil's parent material is colluvium and residuum from gypsiferous lacustrine sediments. The moisture regime of the soil is typical aridic and the temperature regime is thermic. The water erosion hazard is slight to moderate and wind erosion is slight. The plant-soil moisture relationship is poor as the coarse texture, sodium and other salts, and very high gypsum content combine to severely limit plant available water. The interspersed drainages and washes have more water available for plants.

A typical soil profile is:

C-0 to 1 inch; very fine sandy loam; 7 percent sand and gravel-sized gypsum crystals; strongly effervescent

Cy1-1 to 5 inches; very gravelly sand; 50 percent gravel-sized gypsum crystals, 30 percent sand-sized gypsum crystals; slightly effervescent

Cy2-5 to 20 inches; channery sandy loam; 30 percent channer-sized gypsum crystals; noneffervescent

Cy3-20 to 28 inches; 60 percent weathered gypsite channers; 15 percent gypsite gravel; 10 percent sand-sized gypsum crystals; noneffervescent

Cr-28 inches; gypsite bedrock

The taxonomic classification of the soil is Loamy-skeletal, gypsic, thermic Typic Torriorthents.

Soils correlated to this ecological site include map unit 701044, Gypill soil, Grand Canyon Area, AZ, Parts of Coconino and Mohave Counties SSA.

Table 4. Representative soil features

| | |
|--|---|
| Parent material | (1) Colluvium–rock gypsum |
| Surface texture | (1) Gypsiferous fine sandy loam (2) Very fine sandy loam |
| Family particle size | (1) Sandy |
| Drainage class | Somewhat excessively drained |
| Permeability class | Moderate |
| Soil depth | 51–76 cm |
| Surface fragment cover <=3" | 0–1% |
| Surface fragment cover >3" | 0–1% |
| Available water capacity (0-101.6cm) | 1.78–6.1 cm |
| Calcium carbonate equivalent (0-101.6cm) | 0–5% |
| Electrical conductivity (0-101.6cm) | 2–30 mmhos/cm |
| Sodium adsorption ratio (0-101.6cm) | 2–13 |
| Soil reaction (1:1 water) (0-101.6cm) | 7.6–8.2 |
| Subsurface fragment volume <=3" (Depth not specified) | 10–50% |
| Subsurface fragment volume >3" (Depth not specified) | 15–60% |

Ecological dynamics

The historic climax plant community (HCPC) for a site in North America is the plant community that existed at the time of European immigration and settlement. It is the plant community that was best adapted to the unique combination of environmental factors associated with the site at that time. The HCPC was in dynamic equilibrium with its environment and was able to avoid displacement by the suite of disturbances and disturbance patterns (magnitude and frequency) that naturally occurred within the area occupied by the site. Natural disturbances, such as drought, fire, grazing of native fauna, and insects, were inherent in the development and maintenance of the plant community. The effects of these disturbances are part of the range of characteristics of the site that contribute to the dynamic equilibrium. Fluctuations in the plant community's structure and function caused by the effects of these natural disturbances establish the boundaries of dynamic equilibrium. They are accounted for as part of the range of characteristics for the ecological site. The HCPC is not a precise assemblage of species for which the proportions are the same from place to place or from year to year. Variability is apparent in productivity and occurrence of individual species.

The HCPC for this ecological site has been estimated by sampling relict or relatively undisturbed sites and/or reviewing historic records.

A plant community that is subjected to abnormal disturbances and physical site deterioration or that is protected from natural influences, such as fire and grazing, for long periods seldom typifies the HCPC. Any physical site deterioration caused by the abnormal disturbance may result in the crossing of a threshold or irreversible boundary to another state, or equilibrium, for the ecological site. There may be multiple thresholds and states possible for an ecological site, determined by the type and or severity of abnormal disturbance. The known states and transition

pathways for this ecological site are described in the accompanying state and transition model.

The “Plant Community Plant Species Composition” table provides a list of species and each species or group of species’ annual production in pounds per acre (air-dry weight) expected in a normal rainfall year. Low and high production yields represent the modal range of variability for that species or group of species across the extent of the ecological site.

The “Annual Production by Plant Type” table provides the median air-dry production and the fluctuations to be expected during favorable, normal, and unfavorable years.

The present plant community on an ecological site can be compared to the various common vegetation states that can exist on the site. The degree of similarity is expressed through a similarity index. To determine the similarity index, compare the production of each species to that shown in the plant community description. For each species, count no more than the maximum amount shown for the species, and for each group, count no more than the maximum shown for the group. Divide the resulting total by the total representative value shown in the “Annual Production by Plant Type” table for the reference plant community. Variations in production due to above or below normal rainfall, incomplete growing season or utilization must be corrected before comparing it to the site description. The “Worksheet for Determining Similarity Index” is useful in making these corrections. The accompanying growth curve can be used as a guide for estimating percent of growth completed.

State and transition model



State 1 Historic Climax Plant Community

Community 1.1

Historic Climax Plant Community

This ecological site is characterized by very widely scattered desert shrubs. Shadscale and ephedra are dominant, but white ratany, Fremont dalea and wolfberry are also common. Perennial grasses are almost absent and are confined to drainages. Perennial and annual forbs are widely scattered although they are a significant component of the plant community because of very low overall production. Typical perennial plant spacing is 3.5-5 feet. Cryptogamic crust formation can be extensive in the absence of repeated disturbance.

Table 5. Annual production by plant type

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|-----------------|---------------------|--------------------------------------|----------------------|
| Shrub/Vine | 25 | 39 | 81 |
| Forb | 3 | 12 | 27 |
| Grass/Grasslike | – | 2 | 2 |
| Total | 28 | 53 | 110 |

Table 6. Ground cover

| | |
|-----------------------------------|--------|
| Tree foliar cover | 0% |
| Shrub/vine/liana foliar cover | 0-1% |
| Grass/grasslike foliar cover | 0% |
| Forb foliar cover | 0% |
| Non-vascular plants | 0% |
| Biological crusts | 31-58% |
| Litter | 0% |
| Surface fragments >0.25" and <=3" | 0% |
| Surface fragments >3" | 0% |
| Bedrock | 0% |
| Water | 0% |
| Bare ground | 0% |

Figure 5. Plant community growth curve (percent production by month). AZ3022, 30.2 6-9" p.z. upland sites. Growth begins in the late winter, most growth occurs in the spring..

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 2 | 19 | 33 | 18 | 7 | 7 | 11 | 3 | 0 | 0 | 0 |

Additional community tables

Table 7. Community 1.1 plant community composition

| Group | Common Name | Symbol | Scientific Name | Annual Production (Kg/Hectare) | Foliar Cover (%) |
|------------------------|----------------|--------|---------------------------|-----------------------------------|---------------------|
| Grass/Grasslike | | | | | |
| 1 | | | | 0–2 | |
| | big galleta | PLRI3 | <i>Pleuraphis rigida</i> | 0–2 | – |
| 2 | | | | 0–3 | |
| | Grass, annual | 2GA | <i>Grass, annual</i> | 0–3 | – |
| Forb | | | | | |
| 3 | | | | 1–6 | |
| | desert trumpet | ERIN4 | <i>Eriogonum inflatum</i> | 1–6 | – |

| | | | | | |
|-------------------|--------------------------|-------|--|-------|---|
| 4 | | | | 1-6 | |
| | desert globemallow | SPAM2 | <i>Sphaeralcea ambigua</i> | 1-6 | - |
| 5 | | | | 0-1 | |
| | Forb, perennial | 2FP | <i>Forb, perennial</i> | 0-1 | - |
| | desert marigold | BAMU | <i>Baileya multiradiata</i> | 0-1 | - |
| | dyssodia | DYSSO | <i>Dyssodia</i> | 0-1 | - |
| | pepperweed | LEPID | <i>Lepidium</i> | 0-1 | - |
| | princesplume | STANL | <i>Stanleya</i> | 0-1 | - |
| | wirelettuce | STEPH | <i>Stephanomeria</i> | 0-1 | - |
| 6 | | | | 0-2 | |
| | Forb, annual | 2FA | <i>Forb, annual</i> | 0-2 | - |
| | milkvetch | ASTRA | <i>Astragalus</i> | 0-2 | - |
| | flatcrown buckwheat | ERDE6 | <i>Eriogonum deflexum</i> | 0-2 | - |
| | buckwheat | ERIOG | <i>Eriogonum</i> | 0-2 | - |
| | spurge | EUPHO | <i>Euphorbia</i> | 0-2 | - |
| | lettuce | LACTU | <i>Lactuca</i> | 0-2 | - |
| | evening primrose | OENOT | <i>Oenothera</i> | 0-2 | - |
| | phacelia | PHACE | <i>Phacelia</i> | 0-2 | - |
| | desert Indianwheat | PLOV | <i>Plantago ovata</i> | 0-2 | - |
| Shrub/Vine | | | | | |
| 7 | | | | 11-17 | |
| | shadscale saltbush | ATCO | <i>Atriplex confertifolia</i> | 11-17 | - |
| 8 | | | | 9-15 | |
| | Nevada jointfir | EPNE | <i>Ephedra nevadensis</i> | 6-9 | - |
| | Torrey's jointfir | EPTO | <i>Ephedra torreyana</i> | 6-9 | - |
| 9 | | | | 3-6 | |
| | white ratany | KRGR | <i>Krameria grayi</i> | 3-6 | - |
| 10 | | | | 2-4 | |
| | Fremont's dalea | PSFR | <i>Psoralea fremontii</i> | 2-4 | - |
| 11 | | | | 1-3 | |
| | water jacket | LYAN | <i>Lycium andersonii</i> | 1-3 | - |
| 12 | | | | 0-3 | |
| | narrowleaf goldenbush | ERLI6 | <i>Ericameria linearifolia</i> | 0-3 | - |
| 13 | | | | 0-3 | |
| | creosote bush | LATR2 | <i>Larrea tridentata</i> | 0-3 | - |
| 14 | | | | 0-6 | |
| | Shrub, other | 2S | <i>Shrub, other</i> | 0-2 | - |
| | burrobush | AMDU2 | <i>Ambrosia dumosa</i> | 0-2 | - |
| | desert brickellbush | BRDE3 | <i>Brickellia desertorum</i> | 0-2 | - |
| | Eastern Mojave buckwheat | ERFAP | <i>Eriogonum fasciculatum</i> var. <i>polifolium</i> | 0-2 | - |
| | spiny hopsage | GRSP | <i>Grayia spinosa</i> | 0-2 | - |
| | broom snakeweed | GUSA2 | <i>Gutierrezia sarothrae</i> | 0-2 | - |
| | winterfat | KRLA2 | <i>Krascheninnikovia lanata</i> | 0-2 | - |

| | | | | | |
|--|--------------|-------|-------------------------|-----|---|
| | Mojave yucca | YUSC2 | <i>Yucca schidigera</i> | 0-2 | - |
|--|--------------|-------|-------------------------|-----|---|

Animal community

This ecological site has very limited potential for management of wildlife species. Management should be limited to prescribed livestock and feral burro grazing, and restricting off-road use.

Wildlife species that may be found on this ecological site include great horned owl, common kingsnake, western whiptail, desert woodrat, feral burro, red-tailed hawk, Mohave rattlesnake, chuckwalla, Merriam's kangaroo rat, desert tortoise, roadrunner, speckled rattlesnake, coyote, and kit fox.

Recreational uses

Hunting, hiking, photography, wildlife observation are recreational uses. If easily accessed, this site is also popular for off-road vehicles.

Type locality

| | |
|-------------------------------|---|
| Location 1: Mohave County, AZ | |
| Township/Range/Section | T33N R15W S5 |
| General legal description | Lake Mead National Recreation Area; Gyp Hills 7.5 quad. |

Contributors

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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:

2. Presence of water flow patterns:

3. Number and height of erosional pedestals or terracettes:

-
4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**
-
5. **Number of gullies and erosion associated with gullies:**
-
6. **Extent of wind scoured, blowouts and/or depositional areas:**
-
7. **Amount of litter movement (describe size and distance expected to travel):**
-
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**
-
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**
-
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**
-
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:
-
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**
-
14. **Average percent litter cover (%) and depth (in):**
-

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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:**

17. **Perennial plant reproductive capability:**
