

Ecological site R030XA104AZ Granitic Hills 3-6" p.z.

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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

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.

LRU notes

AZ LRU 30-1 – Lower Mohave Desert

Elevations range from 400 to 2500 feet and precipitation averages 3 to 6 inches per year. Vegetation includes creosotebush, white bursage, Mormon tea, and brittlebush. The soil temperature regime is hyperthermic and the soil moisture regime is typical aridic.

Ecological site concept

This ecological site is located on steep slopes. Soils are non-calcareous, very shallow to shallow over hard granite or gneiss bedrock. Soil textures range from gravelly sandy loam to extremely gravelly sandy loam.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Encelia farinosa</i> (2) <i>Larrea tridentata</i>
Herbaceous	Not specified

Physiographic features

This ecological site occurs as moderately steep to steep granitic hills and mountains. It occurs on all aspects.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain
Flooding frequency	None
Ponding frequency	None
Elevation	152–914 m
Slope	20–65%
Aspect	Aspect is not a significant factor

Climatic features

The 30-1AZ Lower Mohave Desert Shrub land resource unit is characterized by a hot, dry climate. The average annual rainfall is 3 to 6 inches, but it can be extremely variable (e.g. from 0 to 11 inches). There can be long periods when little or no precipitation is received. Most of the precipitation for the year could arrive in just a couple of storms. The soil moisture regime is typic aridic and the soil temperature regime is hyperthermic. Winter precipitation from November through April occurs as gentle rains from storms coming out of the Pacific Ocean. Snow is very rare and only falls in the highest mountains. A seasonal drought occurs in May and June. Summer/fall precipitation from July through October comes from spotty, unreliable, and sometimes violent thunderstorms. The moisture originates in the Gulf of Mexico (and the Pacific Ocean in the fall) and flows into the state on the north end of the Mexican monsoon. Strong winds are common, especially during the spring.

Table 3. Representative climatic features

Frost-free period (average)	325 days
Freeze-free period (average)	365 days
Precipitation total (average)	152 mm

Influencing water features

Soil features

Soils are very shallow to shallow. Textures are extremely gravelly sandy loam to very cobbly sandy loam with subsoil textures that are very gravelly sandy loam to extremely gravelly sandy loam. Parent material is granitic alluvium with a geological formation of granite. Available water capacity is very low; permeability is moderately rapid. Water erosion hazard is severe; wind erosion hazard is slight. Runoff is very rapid. Soils are non-saline, non-sodic with pH range of 8.0-8.2 (moderately alkaline). Soil moisture regime is typic aridic; temperature regime is hyperthermic. Landform and position are backslopes, shoulders and summits of hills and mountains. Rock outcrop is associated with this site. Depth to hard granite or gneiss ranges from 4 to 20 inches.

A typical soil profile is:

A-0 to 2 inches; extremely gravelly sandy loam

Bw-2 to 13 inches; very gravelly sandy loam
 2R-13 inches; unweathered bedrock

This ecological site is correlated to map unit 627048, Goldroad Soil Series, in the Mohave County, AZ, Southern Part SSA and map unit 701103, Lithic Torriorthents, in the Grand Canyon Area, AZ, Parts of Coconino and Mohave County SSA.

Table 4. Representative soil features

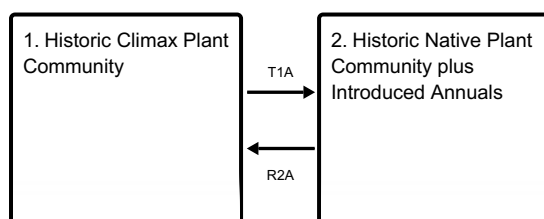
Parent material	(1) Alluvium–granite
Surface texture	(1) Very gravelly sandy loam (2) Very cobbly
Family particle size	(1) Loamy
Permeability class	Moderate to moderately rapid
Soil depth	10–51 cm
Surface fragment cover <=3"	25%
Surface fragment cover >3"	30%
Available water capacity (0-101.6cm)	1.27–2.54 cm
Calcium carbonate equivalent (0-101.6cm)	1–10%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	25%
Subsurface fragment volume >3" (Depth not specified)	30%

Ecological dynamics

The plant community on this site is shrub dominated with a very sparse understory of perennial grasses and perennial forbs. Limited natural disturbance occurs on this site. Steep slopes, rugged terrain, and limited available forage restrict livestock impacts on this site. Annual forbs flourish in springs, particularly following wet winters. The green forage produced during annual forb growth is desired by livestock but this ecological site is largely unused once annuals mature. Non-native annuals are well adapted on this site.

State and transition model

Ecosystem states



State 1 submodel, plant communities

1.1. Historic Climax
Plant Community

State 2 submodel, plant communities

2.1. Non-native
Annuals

**State 1
Historic Climax Plant Community**

**Community 1.1
Historic Climax Plant Community**

The dominant aspect of the site is a sparse desert-shrub cover with annual grasses and forbs intermixed. Creosotebush, white brittlebush and white bursage are the major shrubs. This site is ephemeral range (annual grasses and forbs with green and growing) for livestock grazing. Because of steep rocky slopes, domestic livestock use is very difficult to achieve.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	182	196	211
Grass/Grasslike	43	35	56
Forb	28	49	43
Total	253	280	310

Figure 4. Plant community growth curve (percent production by month). AZ3011, 30.1 3-6" p.z. all sites. Growth begins in late winter, most growth occurs in the spring..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	7	30	32	13	7	3	5	2	1	0	0

Figure 5. Plant community growth curve (percent production by month). AZ3082, 30.27 3-6" p.z. creosotebush. Growth occurs mostly in the spring using stored winter moisture. Flowers and sets seed by July..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	20	40	20	20	0	0	0	0	0	0

Figure 6. Plant community growth curve (percent production by month). AZ3083, 30.27 3-6" p.z. white bursage. Growth begins in early spring. Dormancy occurs during the hot summer months. With sufficient summer/fall precipitation, some plants may break dormancy and produce a flush of growth. Flowers and sets seed by July..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	5	20	40	20	15	0	0	0	0	0	0

Figure 7. Plant community growth curve (percent production by month). AZ3084, 30.27 3-6" p.z. white brittlebush. Growth begins in the late winter and continues through mid spring, goes dormant during the summer heat. Flowers and sets seed by July..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	5	30	45	20	0	0	0	0	0	0	0

Figure 8. Plant community growth curve (percent production by month). AZ3086, 30.27 3-6" p.z. big galleta. Growth begins in the late winter and early spring, goes dormant in May through June, most growth occurs during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	10	20	10	0	0	15	40	5	0	0	0

State 2

Historic Native Plant Community plus Introduced Annuals

Community 2.1

Non-native Annuals

This plant community resembles the historic native plant community, but exotic annuals have been introduced. Non-native species include red brome, Mediterranean grass (*Schismus* spp.), and filaree. The flourish of non-native annuals that occurs following rainfalls may preclude native annuals.

Transition T1A

State 1 to 2

Introduction of non-native annual and grass seed.

Restoration pathway R2A

State 2 to 1

None known

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				0–9	
	Parish's threeawn	ARPUP5	<i>Aristida purpurea var. parishii</i>	0–9	–
2				2–13	
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	2–13	–
3				0–6	
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	0–6	–
4				0–6	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	0–6	–
5				0–6	
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	0–6	–
6				2–6	
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	2–6	–
7				2–13	
	Grass, annual	2GA	<i>Grass, annual</i>	2–13	–
Forb					
8				2–13	
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	2–13	–
9				2–9	
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	2–9	–
10				2–13	
	Forb, perennial	2FP	<i>Forb, perennial</i>	2–13	–
11				2–13	
	Forb, annual	2FA	<i>Forb, annual</i>	2–13	–
Shrub/Vine					
12				43–56	
	brittlebush	ENFA	<i>Encelia farinosa</i>	43–56	–
13				56–84	
	creosote bush	LATR2	<i>Larrea tridentata</i>	56–84	–
14				43–56	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	43–56	–
15				0–9	
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	0–9	–
16				0–6	
	white ratany	KRGR	<i>Krameria grayi</i>	0–6	–
17				0–6	
	sweetbush	BEJU	<i>Bebbia juncea</i>	0–6	–
18				0–2	
19				2–13	
	Shrub, other	2S	<i>Shrub, other</i>	2–13	–

Contributors

Approval

Kendra Moseley, 10/21/2024

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	05/13/2025
Approved by	Kendra Moseley
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:**
-