USDA Natural Resources
Conservation Service

Ecological site R030XB201AZ
Andesite Hills 6-9" p.z. Coarse

Last updated: 10/21/2024
Accessed: 05/11/2025

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): 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 30-2 – 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.

Ecological site concept

This ecological site is located on steeply sloping uplands (slopes 15%-65%). Soils are very shallow to andesite

bedrock.

Associated sites

R030XA107AZ	**Limy Slopes 3-6" p.z.**
R030XA118AZ	**Volcanic Hills 3-6" p.z.**
R030XB202AZ	**Basalt Hills 6-9" p.z.**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Larrea tridentata* (2) *Ambrosia dumosa*
Herbaceous	Not specified

Physiographic features

This ecological site occurs in an upland position on shoulders, sideslopes and summits of hills and mountains. These hills and mountains are low and rolling and are mottled in appearance. The ecological site occurs on all aspects.

Table 2. Representative physiographic features

Landforms	(1) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	2,300–2,900 ft
Slope	15–35%

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)	9 in

Influencing water features

Soil features

Soils of this ecological site are very shallow and shallow. The surface texture of the soil is extremely gravelly sandy loam to extremely cobbly sandy loam. Subsoil textures are very gravelly to extremely gravelly sandy loam. The geologic formation on which the ecological site lies is andesite. Available water capacity is very low. Erosion hazard is moderate for water and slight for wind. Soils are non-sodic, non-saline with pH of 7.9-8.4. Soil moisture regime is typic aridic; soil temperature is thermic. Depth to andesite bedorck is 4-5 inches.

A typical taxonomic classification is Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Torriorthents and a typical soil profile is:
A-0 to 2 inches; extremely gravelly sandy loam
C-2 to 5 inches; very gravelly sandy loam
2R-5 inches; unweathered bedrock

This ecological site has been correlated to map units 627091 and 627092, Razorback soils, Mohave County, AZ, Southern Part SSA.

Table 4. Representative soil features

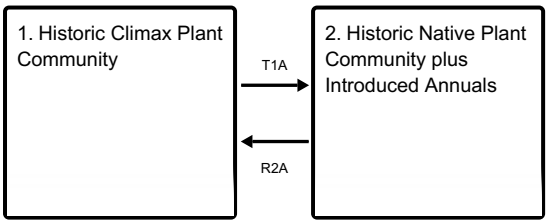
Surface texture	(1) Extremely gravelly sandy loam (2) Extremely cobbly sandy loam
Family particle size	(1) Loamy
Drainage class	Somewhat excessively drained
Permeability class	Moderately rapid
Soil depth	5–15 in
Surface fragment cover <=3"	45–80%
Surface fragment cover >3"	0–55%
Available water capacity (0-40in)	0.15–1 in
Calcium carbonate equivalent (0-40in)	1–15%
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	50–80%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

Andesite Hills, 6"-9" p.z., is a shrub dominated ecological site. Sparse perennial grasses and forbs are occasionally encountered. Annual forbs and grasses flourish following rainfall. Natural disturbances are rare. After introduction of non-native annuals (forbs and/or grasses), an increased seasonal herbaceous production following periods of rain. Dominant shrubs are creosote and white bursage. Assorted half-shrubs are widely scattered.

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 this ecological site plant community is of desert shrubs. The site is dominated by creosotebush and white bursage, which is due to high temperatures and low precipitation. This site has poor soil moisture plant relationship. Degradation occurs only because of catastrophic events such as fire, flood, or man-caused disturbances. If the shrubs are lost, there would be only annual plants, leaving the soil exposed for most of the year. Soil protection is critical as this soil is only about 4-5 inches deep. The site's total biomas production by weight (air-dried)is comprised of: grasses and grasslike plants - 1 to 5 percent, forbs 1 to 5 percent, and shrubs 85 to 95 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	74	115	182
Forb	1	5	9
Grass/Grasslike	1	5	9
Total	**76**	**125**	**200**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0-2%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	0%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Table 7. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	–	–	0-2%
>0.5 <= 1	–	–	0-2%	–
>1 <= 2	–	4-6%	–	–
>2 <= 4.5	–	–	–	–
>4.5 <= 13	–	–	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

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

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 forb and grass seed.

Restoration pathway R2A
State 2 to 1

None known.

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				1–2	
	sixweeks grama	BOBA2	*Bouteloua barbata*	1–2	–
2				1–5	
	Grass, annual	2GA	*Grass, annual*	1–5	–
Forb					
3				1–6	
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	1–6	–
4				1–4	
	Forb, annual	2FA	*Forb, annual*	1–4	–
Shrub/Vine					
5				44–56	
	creosote bush	LATR2	*Larrea tridentata*	44–56	–
6				38–50	
	burrobush	AMDU2	*Ambrosia dumosa*	38–50	–
7				1–6	
	Nevada jointfir	EPNE	*Ephedra nevadensis*	1–6	–
8				1–6	
	littleleaf ratany	KRER	*Krameria erecta*	1–6	–
9				0–4	
	rayless goldenhead	ACSP	*Acamptopappus sphaerocephalus*	0–4	–
10				0–2	
	water jacket	LYAN	*Lycium andersonii*	0–2	–
11				1–4	
	Mojave yucca	YUSC2	*Yucca schidigera*	1–4	–
12				0–1	
	Eastern Mojave buckwheat	ERFA2	*Eriogonum fasciculatum*	0–1	–
13				0–1	
	Forb, perennial	2FP	*Forb, perennial*	2–4	–
	pricklypear	OPUNT	*Opuntia*	0–1	–

Contributors

Harmon Hodgkinson
Harmon S. Hodgkinson
Larry D. Ellicott
Stephen Cassady

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	05/11/2025
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:**
