

Ecological site R030XB202AZ

Basalt Hills

6-9" p.z.

Last updated: 10/21/2024

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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.

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 shallow to dark colored basalt bedrock. Dark colored basalt cobbles and gravels armor the soil surface.

Associated sites

R030XB214AZ	Limy Upland 6-9" p.z.
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Similar sites

R030XB201AZ	Andesite Hills 6-9" p.z. Coarse This ecological site occurs on andesite bedrock.
R030XA101AZ	Basalt Hills 3-6" p.z. This ecological site occurs at lower elevation, higher temperature and lower precipitation.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Larrea tridentata</i>

Herbaceous	Not specified
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Physiographic features

This ecological site occurs in an upland position on basalt hills and mountains in association with basalt outcrop. It occurs on all aspects.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain
Flooding frequency	None
Ponding frequency	None
Elevation	610 – 1,280 m
Slope	20 – 70 %

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)	260 days
Freeze-free period (average)	290 days
Precipitation total (average)	230 mm

Influencing water features

Soil features

The soil of this ecological site is shallow and is underlain by basalt bedrock. The soil surface is often covered with basalt stones, cobbles and gravels. The available water capacity of the soil is very low. The soil hazard to wind erosion is slight; water erosion is moderate to severe. Runoff from the site is slow. The soil is non-sodic, non-saline with a pH of 7.4 to 8.4. The moisture regime of the soil is typical aridic and temperature regime is thermic.

A typical soil profile is:

A-0 to 2 inches; extremely cobbly loam

Bk-2 to 15 inches; extremely gravelly loam

2R-15 inches; unweathered bedrock

The taxonomic classification of the soil is Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Torriorthents.

Soils correlated to this ecological site include map units 627092, 627094, 627096, 627104 Razorback soil, Mohave County, AZ, Southern Part SSA.

Table 4. Representative soil features

Surface texture	(1) Extremely gravelly loam (2) Extremely stony loam (3) Extremely cobbly loam
Family particle size	(1) Loamy
Drainage class	Somewhat excessively drained
Permeability class	Moderate
Soil depth	30 – 50 cm
Surface fragment cover <=3"	50 – 60 %
Surface fragment cover >3"	70 – 80 %
Available water capacity (0-101.6cm)	15.24 – 2.54 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 8.4

Subsurface fragment volume <=3" (Depth not specified)	70 – 80 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological dynamics

Basalt Hills, 6"-9" p.z., is a shrub dominated ecological site. 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), the shift in total productivity is shift increased seasonal herbaceous production following periods of rain. Dominant shrubs are creosote, brittlebush and white bursage. Assorted half-shrubs are widely scattered.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1				2-11	
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	2-11	–
2				2-11	
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	2-11	–
3				11-22	
	Grass, annual	2GA	<i>Grass, annual</i>	11-22	–
4				0-7	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-7	–
Forb					
5				0-4	
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	0-4	–
6				11-34	
	Forb, annual	2FA	<i>Forb, annual</i>	11-34	–
7				2-11	
	Forb, perennial	2FP	<i>Forb, perennial</i>	2-11	–
Shrub/Vine					
8				67-90	
	creosote bush	LATR2	<i>Larrea tridentata</i>	67-90	–
9				2-11	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	2-11	–
10				2-11	
	button brittlebush	ENFR	<i>Encelia frutescens</i>	2-11	–
11				0-11	
	brittlebush	ENFA	<i>Encelia farinosa</i>	55-91	–
12				2-11	
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	2-11	–
13				2-11	

	littleleaf ratany	KRER	<i>Krameria erecta</i>	2-11	–
14				0-11	
	blackbrush	CORA	<i>Coleogyne ramosissima</i>	0-11	–
15				2-11	
	Eastern Mojave buckwheat	ERFAP	<i>Eriogonum fasciculatum var. polifolium</i>	2-11	–
16				2-4	
	water jacket	LYAN	<i>Lycium andersonii</i>	2-4	–
17				0-2	
18				2-11	
	Shrub, other	2S	<i>Shrub, other</i>	2-11	–

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Contributors

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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	08/29/2026
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:
