USDA Natural Resources
Conservation Service

Ecological site R030XC333AZ
Basalt Hills 10-13" p.z. Limy

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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.

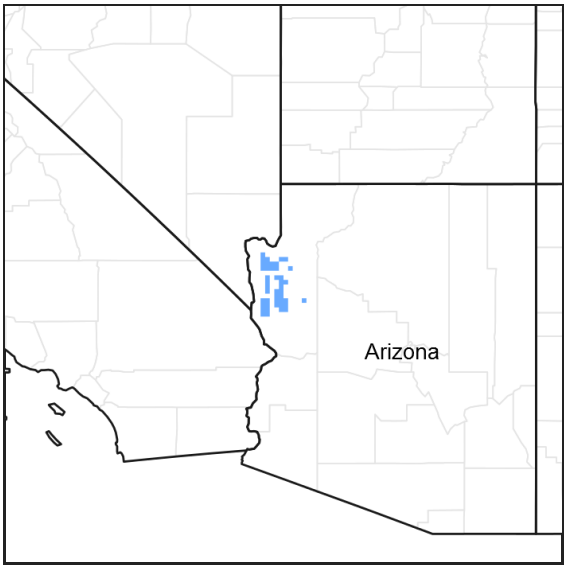


Figure 1. Mapped extent

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 30-3 – Upper Mohave Desert

Elevations range from 2800 to 4500 feet and precipitation averages 9 to 12 inches per year. Vegetation includes Joshua tree, blackbrush, creosotebush, ratany, bush muhly, big galleta, black grama, desert needlegrass, and Indian ricegrass. 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 (15%-65%) uplands. Soils are very shallow to shallow over basalt bedrock.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Eriogonum fasciculatum* (2) *Larrea tridentata*
Herbaceous	Not specified

Physiographic features

This ecological site occurs in an upland positon on shoulders and backslopes of mountains and hills.

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	2,800–4,500 ft
Slope	15–70%
Aspect	Aspect is not a significant factor

Climatic features

The climate is arid and warm. Annual precipitation ranges from 10 to 13 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 46 to 76 degrees F. The average frost-free period ranges from 121 to 231 days.

Table 3. Representative climatic features

Frost-free period (average)	231 days
Freeze-free period (average)	269 days
Precipitation total (average)	13 in

Influencing water features

Soil features

The soil of this ecological site is shallow with surface textures of extremely cobblly loam and extremely stony loam. Subsoil textures are extremely gravelly loam. Soil parent materials are alluvium and colluvium from basalt. Soil available water capacity is very low. The soil's erosion hazard by water is severe and by wind is slight. Runoff from this soil is slow. The soil is non-saline, non-sodic with pH of 8.0 (moderately alkaline). The soil moisture regime is typic aridic and temperature regime is thermic.

Depth to basalt bedrock is about 15 inches. Rock outcrop is associated with the site.

A typical soil profile is:
A-0 to 2 inches; very stony loam
Bk-2 to 15 inches; very gravelly loam
2R- 15 inches; unweathered bedrock

Taxonomic classifications of soils correlated to this ecological site include Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Torriorthents; Loamy-skeletal, mixed, superactive, thermic Typic Haplocalcids.

Map units correlated to this ecological site include 627093, 627095, 627136, Razorback and Nickel family soils, Mohave County, AZ, Southern Part SSA.

Table 4. Representative soil features

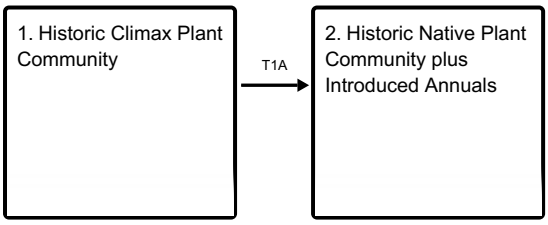
Parent material	(1) Alluvium–basalt
Surface texture	(1) Extremely cobbly loam (2) Extremely stony loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate
Soil depth	10–20 in
Surface fragment cover <=3"	45–65%
Surface fragment cover >3"	40–65%
Available water capacity (0-40in)	0.5–1 in
Calcium carbonate equivalent (0-40in)	2–10%
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	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, 10"-13" 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), they flourish following wet winters. Dominant shrubs are flattop buckwheat, 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 plant community is a desert shrub with grasses and forbs. Major shrubs include flattop buckwheat, range ratany, white bursage, creosotebush and, in some areas, blackbrush. Big galleta and desert needlegrass are the dominant grasses. Forbs are present usually in minor amounts. Most of the site is difficult to graze due to loose rock material on the soil surface and steep slopes.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	67	188	479
Grass/Grasslike	22	75	205
Forb	11	35	102
Tree	0	2	14
Total	**100**	**300**	**800**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	1-3%
Grass/grasslike foliar cover	0-2%
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	–	–	2-4%	–
>1 <= 2	–	–	–	–
>2 <= 4.5	–	9-11%	–	–
>4.5 <= 13	0-2%	–	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Figure 5. Plant community growth curve (percent production by month). AZ3024, 30.3 10-13" p.z. upland sites. Growth begins in the spring and continues through the summer..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	8	18	18	11	14	20	8	2	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 wild oat, 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.

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				3–15	
	big galleta	PLRI3	*Pleuraphis rigida*	3–15	–
2				3–15	
	desert needlegrass	ACSP12	*Achnatherum speciosum*	3–15	–
3				18–45	
	Grass, annual	2GA	*Grass, annual*	18–45	–
4				3–15	
	Grass, perennial	2GP	*Grass, perennial*	3–15	–
Forb					
5				3–15	

	desert Indianwheat	PLOV	*Plantago ovata*	3–15	–
6				3–15	
	Forb, annual	2FA	*Forb, annual*	3–15	–
7				3–15	
	Forb, perennial	2FP	*Forb, perennial*	3–15	–
Shrub/Vine					
8				15–30	
	burrobush	AMDU2	*Ambrosia dumosa*	15–30	–
9				3–15	
	button brittlebush	ENFR	*Encelia frutescens*	3–15	–
10				3–15	
	Nevada jointfir	EPNE	*Ephedra nevadensis*	3–15	–
11				15–30	
	littleleaf ratany	KRER	*Krameria erecta*	15–30	–
12				30–45	
	Eastern Mojave buckwheat	ERFAP	*Eriogonum fasciculatum var. polifolium*	30–45	–
13				3–15	
	blackbrush	CORA	*Coleogyne ramosissima*	3–15	–
14				0–15	
	turpentine bush	ERLA12	*Ericameria laricifolia*	0–15	–
15				15–30	
	creosote bush	LATR2	*Larrea tridentata*	15–30	–
16				0–9	
	rayless goldenhead	ACSP	*Acamptopappus sphaerocephalus*	0–9	–
17				0–3	
	buckhorn cholla	CYACM	*Cylindropuntia acanthocarpa var. major*	0–3	–
18				3–15	
	Shrub, other	2S	*Shrub, other*	3–15	–
Tree					
19				0–6	
	California juniper	JUCA7	*Juniperus californica*	0–6	–

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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	05/10/2025
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:**