

Ecological site R030XC324AZ
Shallow Upland
10-13" 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 30-3 – 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 gently sloping uplands. Soils are calcareous, very shallow to shallow, over bedrock without lime cemented coating or pan.

Associated sites

R030XC318AZ	Sandy Loam Upland 10-13" p.z. Limy, Skeletal
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Coleogyne ramosissima</i> (2) <i>Ephedra nevadensis</i>
Herbaceous	Not specified

Physiographic features

This ecological site is found in an upland position on ridges, summits, sideslopes and footslopes of mesa remnants, plateaus and fan terraces.

Table 2. Representative physiographic features

Landforms	(1) Mesa (2) Plateau (3) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	910 – 1,370 m
Slope	0 – 40 %
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)	230 days
Freeze-free period (average)	270 days
Precipitation total (average)	330 mm

Influencing water features

Soil features

The soil of this ecological site is shallow to deep (deep soil has a very high calcium carbonate at shallow depths) with surface textures of very gravelly sandy loam, very gravelly fine sandy loam, gravelly fine sandy loam, very gravelly loam, and very cobbly sandy loam. Subsoil textures are very gravelly sandy loam, fine sandy loam, gravelly loam, very gravelly loam and very cobbly loam. Soil parent material is mixed alluvium and colluvium from sedimentary and limestone formations (Kaibab Limestone). Soil available water capacity is very low to medium. The soil's erosion hazard by water is moderate to very severe and by wind is slight to moderate. Soils are non-saline, non-sodic with pH of 7.9-8.4 (moderately alkaline). The soil moisture regime is typic aridic and temperature regime is thermic. The soil is highly calcareous.

A typical soil profile is:

0 to 2 inches; very gravelly fine sandy loam

2 to 12 inches; calcareous very gravelly sandy loam

12 inches; limestone bedrock

Taxonomic classification of soil includes Loamy-skeletal, mixed, thermic Lithic Calciorthids; Loamy-skeletal, mixed, thermic, shallow Typic Paleorthids.

Mapping units correlated to this ecological site include 623037,623039, 623087, 623089, 623097, Hobog, Winkel, and Yurm soils, Shivwits Area, AZ, Part of Mohave County SSA.

Table 4. Representative soil features

Parent material	(1) Alluvium – limestone
Surface texture	(1) Very gravelly sandy loam (2) Gravelly fine sandy loam (3) Very cobbly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate to moderately rapid
Soil depth	30 – 50 cm
Surface fragment cover <=3"	50 – 60 %
Surface fragment cover >3"	10 – 20 %
Available water capacity (0-101.6cm)	1.27 – 2.54 cm
Calcium carbonate equivalent (0-101.6cm)	20 – 30 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified

Soil reaction (1:1 water) (0-101.6cm)	7.9 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	50 – 60 %
Subsurface fragment volume >3" (Depth not specified)	10 – 20 %

Ecological dynamics

Shallow Upland, 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), the shift in total productivity is shift increased seasonal herbaceous production following periods of rain. Dominant shrub is blackbrush. 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				3-7	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-3	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	0-3	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	0-3	–
	threeawn	ARIST	<i>Aristida</i>	0-3	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	0-3	–
	squirreltail	ELELE	<i>Elymus elymoides ssp. elymoides</i>	0-3	–
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	0-3	–
	slim tridens	TRMU	<i>Tridens muticus</i>	0-3	–
2				0-7	
	Grass, annual	2GA	<i>Grass, annual</i>	0-7	–
Forb					
3				3-7	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-3	–
	winding mariposa lily	CAFL	<i>Calochortus flexuosus</i>	0-3	–
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	0-3	–
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	0-3	–
4				0-7	
	Forb, annual	2FA	<i>Forb, annual</i>	0-3	–
	phacelia	PHACE	<i>Phacelia</i>	0-3	–
Shrub/Vine					
5				168-235	
	blackbrush	CORA	<i>Coleogyne ramosissima</i>	168-235	–

6				34-50	
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	34-50	–
7				17-34	
	banana yucca	YUBA	<i>Yucca baccata</i>	17-34	–
8				3-17	
	creosote bush	LATR2	<i>Larrea tridentata</i>	3-17	–
9				3-10	
	pricklypear	OPUNT	<i>Opuntia</i>	3-10	–
10				3-10	
	pricklypear	OPUNT	<i>Opuntia</i>	3-10	–
11				3-17	
	Shrub, other	2S	<i>Shrub, other</i>	0-6	–
	rayless goldenhead	ACSP	<i>Acamptopappus sphaerocephalus</i>	0-6	–
	purple coneflower	ECHIN	<i>Echinacea</i>	0-6	–
	button brittlebush	ENFR	<i>Encelia frutescens</i>	0-6	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	0-6	–
	barrel cactus	FEROC	<i>Ferocactus</i>	0-6	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0-6	–
	burrobrush	HYSA	<i>Hymenoclea salsola</i>	0-6	–
	water jacket	LYAN	<i>Lycium andersonii</i>	0-6	–
	Utah mortonia	MOUT	<i>Mortonia utahensis</i>	0-6	–
	Fremont's dalea	PSFR	<i>Psoralea fremontii</i>	0-6	–
	Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>	0-6	–
Tree					
12				0-17	
	Joshua tree	YUBR	<i>Yucca brevifolia</i>	0-17	–

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)	
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Contact for lead author	
Date	08/30/2026
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:
