Ecological site R030XB222AZ
Gypsum Hills
6-9" p.z.
Alkaline

Last updated: 10/21/2024
Accessed: 09/01/2026

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 very shallow to shallow, derived from Moenkopi gypsum. Underlying parent material is hard gypsite.

Associated sites

R030XB224AZ	**Gypsum Fan 6-9" p.z.**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex confertifolia* (2) *Ephedra nevadensis*
Herbaceous	Not specified

Physiographic features

This ecological site occurs on rounded, eroding hills and escarpments. The soils are derived from Moenkopi gypsum.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Escarpment
Flooding frequency	None
Ponding frequency	None
Elevation	490 – 1,040 m
Slope	20 – 40 %
Aspect	Aspect is not a significant factor

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 very shallow to shallow to hard gypsite. The soil is gypsiferous throughout the profile. The hazard of water erosion is severe and hazard of wind erosion is moderately high.

A typical soil profile is:
A--0 to 2 inches; pink (7.5YR 7/4) fine sandy loam, brown (7.5YR 5/4) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; very few very fine roots; many fine and very fine vesicular pores; 2 percent gypsum; strongly effervescent, 33 percent calcium carbonate equivalent; moderately alkaline (pH 8.0); abrupt smooth boundary. (1 to 2 inches thick)

Cy--2 to 6 inches; pale yellow (5Y 7/3) fine and medium sand sized dispersed crystalline gypsite with white (N 8/) 1 to 2 cm bands of harder more consolidated crystalline gypsite and 10 to 20 percent loamy material, pale olive and white (5Y 6/3 and N 8/) moist; slightly hard and hard, friable and firm, nonsticky and nonplastic; many fine and very fine irregular pores; 32 percent gypsum; slightly effervescent, 30 percent calcium carbonate equivalent; slightly alkaline (pH 7.8); abrupt smooth boundary. (3 to 10 inches thick)

Cr1--6 to 10 inches; white, pink and light brownish gray (N 8/, 5YR 8/4, 2.5YR 6/2) stratified weathered gypsiferous materials (crystalline gypsite, siltstone and mudstone); very hard, very firm; 40 percent gypsum; noneffervescent; abrupt boundary. (0 to 10 inches thick)

Cr2--10 to 60 inches; hard gypsite.

The soil taxanomic classification is: Loamy, gypsic, thermic, shallow Typic Torriorthents

Soils correlated to this ecological site include map unit 623028 and 623029, Gypill soil, Shivwits Area SSA.

Table 4. Representative soil features

Parent material	(1) Alluvium – mudstone (2) Colluvium – siltstone
Surface texture	(1) Fine sandy loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to moderate
Soil depth	10 – 40 cm
Surface fragment cover <=3"	Not specified
Available water capacity (0-101.6cm)	0 – 6.35 cm
Calcium carbonate equivalent (0-101.6cm)	10 – 40 %
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)	0 – 30 %

Ecological dynamics

Gypsum Hills, 6"-9" p.z., Alkaline, is a sparse saltbush dominated ecological site. Annual forbs and grasses flourish following rainfall. Natural disturbances are rare. After introduction of non-native annuals (forbs and/or grasses), seasonal herbaceous production increases following periods of rain. Dominant shrubs are shadscale and Mormon tea. Creosote and white bursage are very sparse. Perennial grasses and forbs are largely absent from this ecological site.

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 (%)
Forb					
1				1-2	
	desert trumpet	ERIN4	*Eriogonum inflatum*	1-2	–
2				0-9	
	Forb, perennial	2FP	*Forb, perennial*	0-9	–
3				1-2	
	Forb, annual	2FA	*Forb, annual*	1-2	–
Shrub/Vine					
4				34-50	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	34-50	–
5				9-17	
	Nevada jointfir	EPNE	*Ephedra nevadensis*	9-17	–
6				4-9	
	creosote bush	LATR2	*Larrea tridentata*	4-9	–
7				1-2	
	white ratany	KRGR	*Krameria grayi*	1-2	–
8				1-4	
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	1-4	–

Table 6. Community 2.1 plant community composition

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

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	09/01/2026
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:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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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:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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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:**

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17. **Perennial plant reproductive capability:**
