Ecological site R030XB224AZ
Gypsum Fan
6-9" p.z.

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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 found on gently sloping uplands. The calcareous soils are non-skeletal, deep, and have visible gypsum crystals at depths within the profile. Soil texture is sandy loam throughout.

Associated sites

R030XB208AZ	**Gypsum Hills 6-9" p.z.**
R030XB222AZ	**Gypsum Hills 6-9" p.z. Alkaline**
R030XB225AZ	**Loamy Wash 6-9" p.z. Gypsic**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Ambrosia dumosa* (2) *Ephedra nevadensis*
Herbaceous	(1) *Pleuraphis rigida*

Physiographic features

This ecological site is found in an upland position on summits of fan terraces.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Fan
Flooding duration	Extremely brief (0.1 to 4 hours)
Flooding frequency	None to rare
Ponding frequency	None
Elevation	490 – 980 m
Slope	0 – 20 %
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 deep to very deep. It is highly gypsiferous, being formed from mixed alluvium from gypsiferous sedimentary layers of the Kaibab and Moenkopi formations. The surface texture of the soil is generally very gravelly fine sandy loam. Subsurface textures include fine sandy loam, sand, very cobbly sandy loam and loam. The soil permeability is moderately rapid to rapid. It is naturally a very erosive soil with a hazard of erosion by water of moderate to very severe and by wind of moderate. It is a non-saline, non-sodic soil with a PH of 7.6 to 8.2 (slightly to moderately alkaline).

A typical profile is:
0 to 2 inches; very gravelly fine sandy loam
2 to 12 inches; calcareous loam
12 to 29 inches; gypsiferous sandy loam that has 40 to 80 percent crystalline gypsum as sand-size particles
29 to 32 inches; crystalline gypsum
32 to 40 inches; gypsiferous sandy loam that has 50 percent crystalline gypsum
40 to 60 inches; very cobbly sandy loam that has 80 percent gypsum

This ecological site has been correlated to map unit 623067, Ruesch soil, Shivwits Area, AZ, SSA.

Table 4. Representative soil features

Parent material	(1) Alluvium – rock gypsum
Surface texture	(1) Very gravelly fine sandy loam
Family particle size	(1) Loamy
Drainage class	Somewhat excessively drained
Permeability class	Moderately rapid
Soil depth	150 cm
Surface fragment cover <=3"	40 – 50 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	10.16 – 17.78 cm
Calcium carbonate equivalent (0-101.6cm)	10 – 20 %
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 – 10 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

This ecological site is dominated by dispersed desert shrubs. Perennial grasses and forbs are present in natural depressions. Annual forbs and grasses flourish following rainfall. Natural disturbances are rare; however, the gypsiferous soils are vulnerable to water erosion after soil disturbance. After introduction of non-native annuals (forbs and/or grasses), the shift in total productivity with shift slightly toward seasonal herbaceous production following periods of rain. Dominant shrubs are creosote 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				13-28	
	big galleta	PLRI3	*Pleuraphis rigida*	13-28	–
2				2-6	
	low woollygrass	DAPU7	*Dasyochloa pulchella*	2-6	–
3				2-9	
	Grass, annual	2GA	*Grass, annual*	0-4	–
	Grass, perennial	2GP	*Grass, perennial*	0-4	–
	threeawn	ARIST	*Aristida*	0-4	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	0-4	–
	burrograss	SCBR2	*Scleropogon brevifolius*	0-4	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0-4	–
	gyp dropseed	SPNE	*Sporobolus nealleyi*	0-4	–
	sixweeks fescue	VUOC	*Vulpia octoflora*	0-4	–
Forb					
4				2-6	
	Forb, perennial	2FP	*Forb, perennial*	0-2	–
	desert marigold	BAMU	*Baileya multiradiata*	0-2	–
	desert trumpet	ERIN4	*Eriogonum inflatum*	0-2	–
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	0-2	–
5				2-6	
	Forb, annual	2FA	*Forb, annual*	0-2	–
	buckwheat	ERIOG	*Eriogonum*	0-2	–

	phacelia	PHACE	*Phacelia*	0-2	–
Shrub/Vine					
6				56-84	
	burrobush	AMDU2	*Ambrosia dumosa*	56-84	–
7				28-56	
	Nevada jointfir	EPNE	*Ephedra nevadensis*	28-56	–
8				28-56	
	white ratany	KRGR	*Krameria grayi*	28-56	–
9				13-43	
	Fremont's dalea	PSFR	*Psorothamnus fremontii*	13-43	–
10				13-28	
	creosote bush	LATR2	*Larrea tridentata*	13-28	–
11				13-28	
	water jacket	LYAN	*Lycium andersonii*	13-28	–
12				9-22	
	banana yucca	YUBA	*Yucca baccata*	9-22	–
13				6-13	
	winterfat	KRLA2	*Krascheninnikovia lanata*	6-13	–
14				2-6	
	rayless goldenhead	ACSP	*Acamptopappus sphaerocephalus*	2-6	–
15				2-6	
	pricklypear	OPUNT	*Opuntia*	2-6	–
16				0-2	
	burrobrush	HYSA	*Hymenoclea salsola*	0-2	–
17				0-6	
	Shrub, other	2S	*Shrub, other*	0-2	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	0-2	–
	echinocactus	ECHIN2	*Echinocactus*	0-2	–
	button brittlebush	ENFR	*Encelia frutescens*	0-2	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0-2	–
	pricklypear	OPUNT	*Opuntia*	0-2	–

Table 6. Community 2.1 plant community composition

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

Table 7. Community 3.1 plant community composition

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

Animal community

Wildlife species found on this ecological site include coyote, jackrabbit, desert cottontail, striped skunk, antelope squirrel, pocket gopher, gopher snake, Mohave rattlesnake, western rattlesnake, raven, pocket mouse, and kangaroo rat.

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	09/05/2026
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):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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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:**
