Ecological site R035XD401AZ
Breaks
7-11" 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): 035X–Colorado Plateau

AZ CRA 35.4 – Colorado Plateau Cold Sagebrush – Grasslands Elevations range from 4200 to 5100 feet and precipitation averages 7 to 11 inches. Vegetation includes winterfat, fourwing saltbush, buckwheat species, needlegrass, bottlebrush squirreltail, Indian ricegrass, black grama, blue grama, sideoats grama, gyp dropseed, and galleta. The soil temperature regime is mesic and the soil moisture regime is typic aridic. This unit occurs within the Colorado Plateau Physiographic Province and is characterized by a sequence of flat to gently dipping sedimentary rocks eroded into plateaus, valleys and deep canyons. Sedimentary rock classes dominate the plateau with volcanic fields occurring for the most part near its margin.

Ecological site concept

This site occurs on steep canyon walls and sides of plateaus and mesas. on escarpments on the Moenkopi Formation below the Shinarump Formation. It typically suffers from excessive runoff from the steep slopes. Elevation is 4,800 to 5,300 feet. Slope is 30 to 70 percent. Complex geology and topography have created a multitude of soil textures, depths and degrees of development. There are areas of exposed sandstone, shale and mudstone. The dominant aspect of this site is a cold desert shrub/grassland. Common species are sulphur-flower buckwheat, skunkbush sumac, needle and thread, and James' galleta. Due to steep slopes access for livestock is severely limited.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Eriogonum umbellatum*
Herbaceous	(1) *Hesperostipa comata ssp. comata* (2) *Pleuraphis jamesii*

Physiographic features

This site occurs on steep canyon walls and sides of plateaus and mesas. It typically suffers from excessive runoff from the steep slopes.

Table 2. Representative physiographic features

Landforms	(1) Canyon (2) Valley side
Flooding frequency	None

Ponding frequency	None
Elevation	1,460 – 1,620 m
Slope	30 – 70 %
Aspect	Aspect is not a significant factor

Climatic features

Winter-Summer moisture ratios are typically 70:30 on the west side of this LRU and shift to 60:40 on the east side. Late spring is usually the driest period, and early fall moisture can be sporadic. Summer rains fall June-September; moisture originates in the Gulf of Mexico and creates convective, usually brief, intense thunderstorms. Cool season moisture October-May tends to be frontal; it originates in the Pacific and the Gulf of California and falls in widespread storms with longer duration and lower intensity. Precipitation generally comes as snow December-February. Accumulations above 10 inches are not common, but can occur. Snow usually lasts 3-4 days, but can persist much longer. Summer daytime temperatures are commonly 95-100 F and, on occasion, exceed 105F. Winter air temperatures can regularly go below 15 F and have been recorded below -15 F.

Table 3 Representative climatic features

Frost-free period (average)	220 days
Freeze-free period (average)	150 days
Precipitation total (average)	280 mm

Influencing water features

Runoff on this ecological site is typically very high due to steep slopes and shallow discontinuous soil cover. Due to its landscape position, this site is not typically influenced by streams or wetlands.

Soil features

The soils on this site occur as steep canyon walls, the sides of plateaus, mesas, hills and on escarpments. It typically suffers from excessive drainage. Complex geology and topography has created a multitude of soil textures, depths and developments. There are areas of exposed sandstone, shale and mudstone.

Typical taxonomic units in this site include:

SSA 623 Shivwits Area - MU 10 Berzatic family;
SSA 625 Mohave County NE Part - MU 64 a reference pedon for torriorthents.

Table 4. Representative soil features

Parent material	(1) Colluvium – sandstone and shale

Surface texture	(1) Extremely cobbly loam (2) Extremely cobbly sandy loam (3) Very bouldery sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Very slow to very rapid
Soil depth	10 – 150 cm
Surface fragment cover <=3"	20 – 50 %
Surface fragment cover >3"	10 – 20 %
Available water capacity (0-101.6cm)	0 – 17.78 cm
Calcium carbonate equivalent (0-101.6cm)	10 – 20 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 10
Subsurface fragment volume <=3" (Depth not specified)	10 – 40 %

Subsurface fragment volume >3" (Depth not specified)	10 %

Ecological dynamics

For state and transition model see ecological group DX0335X02EESG16, Arizona Strip - Typic Aridic - Limestone Slopes.

The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The historical climax plant community represents the natural potential plant communities found on relict or relatively undisturbed sites. Other plant communities described here represent plant communities that are known to occur when the site is disturbed by factors such as grazing, fire, or drought.

Production data provided in this site description is standardized to air-dry weight at the end of the summer growing season. The plant communities described in this site description are based on near normal rainfall years.

NRCS uses a Similarity Index to compare existing plant communities to the plant communities described here. Similarity Index is determined by comparing the production and composition of a plant community to the production and composition of a plant community described in this site description. To determine Similarity Index, compare the production (air-dry weight) of each species to that shown in the plant community description. For each species, count no more than the maximum amount shown for the species, and for each group, count no more than the maximum shown for the group. Divide the resulting total by the total normal year production shown in the plant community description. If rainfall has been significantly above or below normal, use the total production shown for above or below normal years. If field data is not collected at the end of the summer growing season, then the field data must be corrected to the end of the year production before comparing it to the site description. The growth curve can be used as a guide for estimating production at the end of the summer growing season.

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 (%)
Tree					
0	**Trees**			4-11	
	Utah juniper	JUOS	*Juniperus osteosperma*	2-11	–
	twoneedle pinyon	PIED	*Pinus edulis*	2-11	–
Shrub/Vine					
0				135-168	
	sulphur-flower buckwheat	ERUM	*Eriogonum umbellatum*	22-34	–
	skunkbush sumac	RHTR	*Rhus trilobata*	11-34	–
	Apache plume	FAPA	*Fallugia paradoxa*	11-22	–
	mormon tea	EPVI	*Ephedra viridis*	11-22	–
	rubber rabbitbrush	ERNAG	*Ericameria nauseosa ssp. nauseosa var. glabrata*	11-22	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	11-18	–
	Bigelow sage	ARBI3	*Artemisia bigelovii*	2-11	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	4-9	–
	Mexican cliffrose	PUME	*Purshia mexicana*	0-7	–
	banana yucca	YUBA	*Yucca baccata*	0-2	–
	Utah serviceberry	AMUT	*Amelanchier utahensis*	0-2	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	0-2	–
	Torrey's jointfir	EPTO	*Ephedra torreyana*	0-2	–
4	**Other Shrubs**			0-11	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0-11	–

	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	0-11	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	0-11	–
	Eastern Mojave buckwheat	ERFA2	*Eriogonum fasciculatum*	0-11	–
	water jacket	LYAN	*Lycium andersonii*	0-11	–
	Sonoran scrub oak	QUTU2	*Quercus turbinella*	0-11	–
	Mojave sage	SAMO3	*Salvia mohavensis*	0-11	–
	twistspine pricklypear	OPMA2	*Opuntia macrorhiza*	0-2	–
Grass/Grasslike					
0				22-67	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	11-34	–
	James' galleta	PLJA	*Pleuraphis jamesii*	11-18	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	7-13	–
	desert needlegrass	ACSP12	*Achnatherum speciosum*	0-2	–
	squirreltail	ELELE	*Elymus elymoides ssp. elymoides*	0-2	–
1	**Other Perennial Grasses**			0-4	
	Grass, perennial	2GP	*Grass, perennial*	0-4	–
	threeawn	ARIST	*Aristida*	0-4	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	0-4	–
	black grama	BOER4	*Bouteloua eriopoda*	0-4	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0-4	–
Forb					
0				9-36	
	princesplume	STANL	*Stanleya*	7-16	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	0-4	–
	Brenda's yellow cryptantha	CRFL5	*Cryptantha flava*	2-4	–
	flatcrown buckwheat	ERDE6	*Eriogonum deflexum*	2-4	–
	desert trumpet	ERIN4	*Eriogonum inflatum*	0-4	–
	whitestem blazingstar	MEAL6	*Mentzelia albicaulis*	0-4	–
2	**Other Perennial Forbs**			2-4	
	Forb, perennial	2FP	*Forb, perennial*	2-4	–
	brownfoot	ACWR5	*Acourtia wrightii*	2-4	–
	buckwheat	ERIOG	*Eriogonum*	2-4	–
	fineleaf hymenopappus	HYFI	*Hymenopappus filifolius*	2-4	–
	beardtongue	PENST	*Penstemon*	2-4	–
	rock goldenrod	PEPU7	*Petradoria pumila*	2-4	–
	spiny phlox	PHHO	*Phlox hoodii*	2-4	–
3	**Other Annual Forbs**			2-7	
	Forb, annual	2FA	*Forb, annual*	2-7	–
	milkvetch	ASTRA	*Astragalus*	2-7	–
	borage	BORAG	*Borago*	2-7	–
	sacred thorn-apple	DAWR2	*Datura wrightii*	2-7	–
	spurge	EUPHO	*Euphorbia*	2-7	–
	gilia	GILIA	*Gilia*	2-7	–
	desert tobacco	NIOBO	*Nicotiana obtusifolia var. obtusifolia*	2-7	–
	phacelia	PHACE	*Phacelia*	2-7	–
	primrose	PRIMU	*Primula*	2-7	–

Animal community

This site is not suitable for grazing by livestock due to the steep topography and limited forage production. Access is severely limited by slope and a cover of cobbles and boulders. Erosion hazard is high because of sparse vegetation, steep slopes and rapid runoff. There is relatively poor diversity within the plant community of this site. Because of the grass component, the site is dominated by grassland wildlife species. However, the site is transitory to almost all species due to lack of available water.

Recreational uses

Steepness of slope and ruggedness of the surface terrain limits recreation use to mainly hiking, wildlife viewing, and photography. Winters are cold, however, relatively mild spring, fall and summer months are attractive to recreationists. Wildlife most likely to be found on the site are; Black-tailed jackrabbit, cottontail rabbit, antelope squirrel, deer mouse, coyote, western rattlesnake, gopher snake, black-collared lizard, longnose leopard lizard, short-horned lizard, red tailed hawk, and ravens.

Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T33N R10W S2
General legal description	Two possible locations: Coconino County - about 7 miles east of Colorado City - Section 5, T41N, R5W; Mohave County - Trail Canyon about 1 mile North of Parashant Canyon - Section 2, T33N, R10W.

Contributors

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Approval

Kendra Moseley, 5/19/2025

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	05/21/2026
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:

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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:**
