Ecological site DX035X03G618
Sandy Upland
13-17" p.z.
Moderately Deep

Accessed: 04/23/2026

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): 035X–Colorado Plateau

AZ CRA 35.6 - Colorado Plateau Pinyon-Juniper-Sagebrush Elevations range from 5500 to 7000 feet and precipitation averages 13 to 17 inches per year. Vegetation includes pinyon, juniper, big sagebrush, cliffrose, Mormon tea, muttongrass, prairie junegrass, squirreltail, western wheatgrass, and blue grama. The soil temperature regime is mesic and the soil moisture regime is aridic ustic. 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.

Associated sites

R035XF607AZ	**Sandy Upland 13-17" p.z.** Sandy Upland, 13-17" p.z.

Similar sites

F035XC323AZ	**Sandy Upland 10-14" p.z. (JUOS)** Sandy Upland (JUOS) 10-14" p.z.

Table 1. Dominant plant species

Tree	(1) *Pinus edulis* (2) *Juniperus osteosperma*
Shrub	(1) *Purshia tridentata* (2) *Artemisia tridentata ssp. vaseyana*
Herbaceous	(1) *Muhlenbergia pungens* (2) *Achnatherum hymenoides*

Legacy ID

R035XF618AZ

Physiographic features

This site is found on plateaus and mesas of Navajo sandstone formation. The topography is generally undulating. The site may occur on either shoulders or summits. Outcrops of sandstone are normally found in association with this site.

Table 2. Representative physiographic features

Landforms	(1) Plateau (2) Mesa
Flooding frequency	None
Ponding frequency	None
Elevation	1,710 – 1,950 m
Slope	0 – 10 %
Aspect	Aspect is not a significant factor

Climatic features

The climate of this land resource unit is semiarid with warm summers and cool winters. The mean annual precipitation ranges from 13 – 17 inches, but it is very erratic, often varying substantially from year to year. The majority of the precipitation comes from October through April. This precipitation comes as gentle rain or snow from frontal storms coming out of the Pacific Ocean. Snow is common from November through February. Generally no more than a few inches of snow accumulates, melting within a few days, but may last a week or more. The remaining precipitation comes from July through September as spotty, unreliable and sometimes violent thunderstorms. The moisture for this precipitation originates in the Gulf of Mexico (and the Pacific Ocean in the fall) and flows into the area on the north end of the Mexican monsoon. Late May through late June is generally a dry period. The mean annual air temperature ranges from 47 to 49 degrees Fahrenheit (F). The frost-free period (air temperature > 32 degrees F) ranges from 113 to 144 days (@ 50 percent probability). Strong winds are common, especially in the spring.

Table 3 Representative climatic features

Frost-free period (average)	140 days
Freeze-free period (average)	160 days
Precipitation total (average)	430 mm

Influencing water features

Soil features

The soils characterizing this site are moderately deep over sandstone bedrock. They are well drained. The surface layer is about 8 inches thick with a texture of fine sand. The subsurface texture is also fine sand. The available water capacity is very low to low.

Typical taxonomic units include:

SSA-625 Mohave County NE part MU 53 Royosa & Tonalea;
SSA-711 Navajo Mountain Area MU 4 Aridic Ustorthents and Royosa.

Table 4. Representative soil features

Parent material	(1) Eolian deposits – sandstone
Surface texture	(1) Fine sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained to excessively drained
Permeability class	Very rapid
Soil depth	100 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	6.35 – 12.7 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
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 – 7.8
Subsurface fragment volume <=3" (Depth not specified)	Not specified

Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

This site is interspersed with the shallower Sandstone Upland, 13-17" p.z. ecological site and rock outcrop. In areas where this site is in small patches the canopy cover trees will increase. In those areas where it is comprised of larger blocks of moderately deep soil it may be more savanah-like.

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	**Perennial Cool Season Grasses**			13-67	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	13-27	–
	threeawn	ARIST	*Aristida*	0-13	–
	squirreltail	ELELE	*Elymus elymoides ssp. elymoides*	0-13	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	0-13	–
	western wheatgrass	PASM	*Pascopyrum smithii*	0-13	–
	muttongrass	POFE	*Poa fendleriana*	0-13	–
2	**Perennial Warm Season Grasses**			54-108	
	sandhill muhly	MUPU2	*Muhlenbergia pungens*	40-67	–
	blue grama	BOGR2	*Bouteloua gracilis*	13-27	–
	spike muhly	MUWR	*Muhlenbergia wrightii*	0-13	–
	James' galleta	PLJA	*Pleuraphis jamesii*	0-13	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0-13	–
Forb					
3	**Perennial Forbs**			40-108	
	buckwheat	ERIOG	*Eriogonum*	13-27	–
	beardtongue	PENST	*Penstemon*	13-27	–
	spiny phlox	PHHO	*Phlox hoodii*	0-13	–
	ragwort	SENEC	*Senecio*	0-13	–
	fiddleneck	AMSIN	*Amsinckia*	0-13	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	0-13	–
	pale bastard toadflax	COUMP	*Comandra umbellata ssp. pallida*	0-13	–
	largeleaf springparsley	CYME	*Cymopterus megacephalus*	0-13	–
Shrub/Vine					
4	**Shrubs**			157-325	
	Gambel oak	QUGA	*Quercus gambelii*	40-81	–
	Utah serviceberry	AMUT	*Amelanchier utahensis*	40-67	–
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	27-54	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	27-54	–
	mormon tea	EPVI	*Ephedra viridis*	13-40	–

	greenleaf manzanita	ARPA6	*Arctostaphylos patula*	13-27	–
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0-13	–
	snakeweed	GUTIE	*Gutierrezia*	0-13	–
	Sonoran scrub oak	QUTU2	*Quercus turbinella*	0-13	–
	spineless horsebrush	TECA2	*Tetradymia canescens*	0-13	–
5	**Yucca and Yucca Like**			27-40	
	narrowleaf yucca	YUAN2	*Yucca angustissima*	27-40	–
	banana yucca	YUBA	*Yucca baccata*	0-13	–
6	**Cacti**			13-27	
	beavertail pricklypear	OPBA2	*Opuntia basilaris*	13-27	–
	hedgehog cactus	ECHIN3	*Echinocereus*	0-13	–
Tree					
7	**Trees**			673-852	
	Utah juniper	JUOS	*Juniperus osteosperma*	336-404	–
	twoneedle pinyon	PIED	*Pinus edulis*	336-404	–
	ponderosa pine	PIPO	*Pinus ponderosa*	0-67	–

Animal community

The suitability for livestock grazing is fair. Loose sand makes travel difficult.

Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T41 N. R5 W. S34
General legal description	Arizona, Mohave County, Moccasin 7 1/2 min. quad., Sec. 34, T. 41 N., R. 5 W., about 4 miles northwest of Moccasin, Arizona.

Other references

Information and updates collected during 2009-2010 for this ESD was conducted as part of an Interagency Technical Assistance Agreement between the Bureau of Indian Affairs–Navajo Region and the NRCS-Arizona.

Contributors

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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	
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):**

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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:**
