Ecological site R035XB238AZ
Sandy Terrace
6-10" p.z.
Sodic

Last updated: 5/20/2025
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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

This ecological site occurs in Common Resource Area 35.2 - the Colorado Plateau Shrub – Grasslands Elevations range from 3800-5800 feet and precipitation averages 6 to 10 inches per year. Vegetation includes shadscale, fourwing saltbush, Mormon tea, blackbrush, Indian ricegrass, galleta, blue grama, and black grama. 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 floodplain steps and, perhaps, lower stream terraces. Soils on this site are sodic, very deep, and well- to excessively well drained. The surface textures include loamy sand to fine sandy loam. Subsurface textures include loamy fine sand, fine sand, silt loam, sandy clay loam, clay loam, fine sandy loam.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Sarcobatus vermiculatus*
Herbaceous	(1) *Sporobolus airoides* (2) *Pleuraphis jamesii*

Physiographic features

"This site occurs adjacent to seeps and on high stream terraces that may still flood* during high flows, but primarily benefit from lateral underground water movement from the stream bed*. The soils are very deep and well drained sodic soils."

This description seems to apply to floodplain steps rather than high terraces.

Table 2. Representative physiographic features

Landforms	(1) Stream terrace (2) Plateau

Flooding duration	Extremely brief (0.1 to 4 hours) to very brief (4 to 48 hours)
Flooding frequency	None to rare
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	None to rare
Elevation	1,160 – 1,770 m
Slope	0 – 10 %
Aspect	Aspect is not a significant factor

Climatic features

The 35.2 Colorado Plateau Cold Desert Shrub - Grassland common resource area has a very dry and windy climate that is hot in the summer and cold in the winter. The annual precipitation averages between 6 and 10 inches. The soil moisture regime is typic aridic and the soil temperature regime is mesic. A slight majority of the precipitation arrives during the late fall, winter, and early spring. This winter season moisture originates in the Pacific Ocean and arrives as rain, or sometimes snow, during widespread frontal storms of generally low intensity. The majority of the snow (average range of 1 to 17 inches) falls from December through February, but rarely lasts more than a few days. A seasonal drought occurs from late May through early July. Summer rains occur from July through September during brief intense local thunderstorms. The rain is sporadic in intensity and location. The moisture originates from the Gulf of Mexico in the early summer and the Gulf of California in the late summer/early fall. Windy conditions are common year round, but the winds are strongest and most frequent during the spring.

Table 3 Representative climatic features

Frost-free period (average)	180 days
Freeze-free period (average)	210 days
Precipitation total (average)	250 mm

Influencing water features

The soil moisture on this ecological site comes from precipitation and supplemental moisture from seeps or storm events. The terrace sites may flood occasionally, but primarily benefit from lateral underground water movement from the streambed that can last for weeks after storm events. This additional moisture allows this site to produce more vegetation than upland sites that depend entirely on rainfall.

Soil features

Soils on this site are sodic, very deep, and well- to excessively well drained. The surface textures include loamy sand to fine sandy loam. Subsurface textures include loamy fine sand, fine sand, silt loam, sandy clay loam, clay loam, fine sandy loam. They are formed in eolian and alluvium derived from sandstone, siltstone and shale. The moisture regime is Typic Aridic and the temperature regime is Mesic.

Typical taxonomic units include:

SSA 707 Little Colorado River Valley Area MU's 22 Tuba, 52 Sheppard, 52 Psammaquents, 62 Tyende;
SSA-713 Chinle Area MU's 24 Nazlini, 46 Aneth;
SSA 717 Shiprock NM - MU's 165 Jeddito, 512 Gotho, and 519 & 523 Shumbegay.

Table 4. Representative soil features

Parent material	(1) Eolian deposits – sandstone and siltstone (2) Alluvium – shale
Surface texture	(1) Loamy fine sand (2) Fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to excessively drained
Permeability class	Moderately slow to rapid
Soil depth	150 cm
Surface fragment cover <=3"	Not specified
Available water capacity (0-101.6cm)	12.7 – 25.4 cm
Electrical conductivity (0-101.6cm)	0 – 10 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	10 – 30
Soil reaction (1:1 water) (0-101.6cm)	7.9 – 10
Subsurface fragment volume <=3" (Depth not specified)	Not specified

Ecological dynamics

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.

The State and Transition model shows the most common occurring plant communities likely to be encountered on this ecological site. This model may not show every possible plant community, but only those that are most prevalent and observed through field inventory. As more data is collected these plant communities may be revised, removed, and some added to reflect the ecological dynamics of this site.

State and transition model

Figure 3. STM - R035XB238AZ

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**Grasses**			146-314	
	alkali sacaton	SPAI	*Sporobolus airoides*	56-112	–
	James' galleta	PLJA	*Pleuraphis jamesii*	28-84	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	28-56	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	0-39	–
	squirreltail	ELELE	*Elymus elymoides ssp. elymoides*	0-28	–
	Grass, perennial	2GP	*Grass, perennial*	0-28	–
Forb					
2	**Forbs**			6-28	
	Forb, perennial	2FP	*Forb, perennial*	6-17	–
	Forb, annual	2FA	*Forb, annual*	0-11	–
Shrub/Vine					
3	**Shrubs**			202-432	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	224-280	–
	Mojave seablite	SUMO	*Suaeda moquinii*	6-28	–
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	6-28	–
	rubber rabbitbrush	ERNAB2	*Ericameria nauseosa ssp. nauseosa var. bigelovii*	0-22	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0-22	–
	goldenbush	ISOCO	*Isocoma*	0-22	–
	mound saltbush	ATOB	*Atriplex obovata*	0-22	–
	shadscale saltbush	ATCO	*Atriplex confertifolia*	0-11	–

	Cutler's jointfir	EPCU	*Ephedra cutleri*	0-6	–

Table 6. Community 2.1 plant community composition

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

Animal community

This site is suitable for grazing during any period of the year by cows and calves, stocker cattle, sheep and horses. Prescribed grazing systems can benefit this site by allowing rest periods for the cool season species. Wildlife diversity on this site is quite limited due to constancy of topography and vegetative form. This site does provide a significant forage substrate for adapted small species.

Recreational uses

Site is located on stable dunes and gently sloping terraces and plateaus which lend themselves to activities such as horseback riding, wildlife observation and hunting. Winters are cold, however, relatively mild spring, fall and summer months are attractive to recreationists.

Type locality

Location 1: Apache County, AZ	
Township/Range/Section	T39N R25E S3
General legal description	Mexican Water SW Quad; four miles east south east of Sand Springs; Section 3, T39N, R25E; Navajo Indian Reservation, AZ.

Other references

Updates and revisions for this ESD were conducted as part of a 2007-2012 Interagency Technical Assistance Agreement between the Bureau of Indian Affairs–Navajo Region and the NRCS-Arizona.

Contributors

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Approval

Kendra Moseley, 5/20/2025

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)	Kenneth Gishi
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Date	08/27/2012
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None expected on level slopes, very few on steeper slopes.

2. **Presence of water flow patterns:** None on level slopes, very few on steeper slopes with widths of 1 to 2 feet when they do occur.

3. **Number and height of erosional pedestals or terracettes:** None.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground ranges from 40-65%.

5. **Number of gullies and erosion associated with gullies:** None.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Few areas of wind scour occur in the interspaces. Some deposition may occur around shrubs and should be less than 6 inches in height.

7. **Amount of litter movement (describe size and distance expected to travel):** Most fine litter will transported by wind or water, while woody litter tends to remain under canopies.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** The expected average soil stability rating is 1-2.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The surface structure is typically moderate (thin, thick) platy structure with a thickness of 2 to 8 inches. Surface textures range from fine sand to fine sandy loam with colors typically light reddish brown to yellowish brown.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** This site is characterized by an even distribution of shrubs and grasses. Herbaceous vegetation generally occurs throughout the shrub interspaces. Perennial grasses and other herbaceous vegetation promote infiltration and assist in slowing runoff moisture. This site when well vegetated is slightly to moderately effective at capturing moisture.

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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):** None. Some soils may a sodium-affected layer (Btn, Bn, or Cn) in the subsurface horizons. This layer is difficult to excavate and may be mistaken for a compacted layer. This layer may also be exposed in areas where the surface layer has been scoured or blown away.

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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: Salt Tolerant Shrubs (black greasewood, shadscale, Torrey seepweed) >>

    Sub-dominant: Warm season grasses > Cool season grasses >

    Other: Forbs > Other shrubs

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** All plant functional groups are adapted to survival in all but the most severe droughts. Severe winter droughts affect shrubs the most. Severe summer droughts affect grasses the most.

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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):** Average annual production on this site is expected to be 450 to 550 lbs/ac. in a year of average annual precipitation.

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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:** Black greasewood, seepweed, mound saltbush and shadscale

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17. **Perennial plant reproductive capability:** All plants native to this site are adapted and are capable of producing seeds, stolons and rhizomes in all but the most severe drought.
