

Ecological site R035XB033NM

Sandy Loam Upland

6-10"

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.

Ecological site concept

The soils are very deep and well drained. Surface textures include loamy sand. The subsoil has textures of fine sandy loam, clay loam, sandy clay loam, and loamy sand. The soils are moderately sodic (SAR 13-30), moderately saline (EC 8-16), and mildly to strongly alkaline (pH 7.4-9.0). This site occurs on eolian-mantled fan terraces (fan remnants). Slopes range from 1 to 3 percent.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Sporobolus airoides</i> (2) <i>Pleuraphis jamesii</i>

Physiographic features

This site occurs on eolian-mantled fan terraces (fan remnants). It benefits from run-in water from adjacent areas after high-intensity short-duration summer thunderstorms. Slopes range from 1 to 3 percent. Elevations range from 5,400 to 5,700 feet.

Table 2. Representative physiographic features

Landforms	(1) Fan remnant
Elevation	1,650 – 1,740 m
Slope	0 %
Aspect	Aspect is not a significant factor

Climatic features

Mean annual precipitation varies from 5 to 8 inches with about 60% of it coming as rain from April through October. May and June are the driest months. Most of the precipitation from November through March comes as snow. High-velocity winds are common in late winter and early spring.

Mean temperatures for the hottest month, July, are about 83 degrees F. The coldest month is January, when the mean temperature is about 27 degrees F. Extreme temperatures of 104 and -17 degrees F have been recorded. The frost-free period ranges from 140 to 160 days.

The cool-season plants start growth in March and end with plant maturity and seed dissemination about mid-June. Warm-season plants grow from June through September, taking advantage of the moisture and warmth from tropical air out of the Gulf of Mexico. About 40 percent of the total precipitation is received during these summer months. The other 60 percent, received from fall through spring, influences cool-season plants.

The tabular climate summary for this ESD was generated by the Climate Summarizer (http://www.nm.nrcs.usda.gov/technical/handbooks/nrph/Climate_Summarizer.xls) using data from the following climate stations (results are unweighted averages):

296098 Newcomb, NM (Period of record = 1948 to 1971)

298284 Shiprock, NM (Period of record = 1926 to 2006)

Table 3 Representative climatic features

Frost-free period (average)	170 days
Freeze-free period (average)	190 days
Precipitation total (average)	180 mm

Influencing water features

This site occurs on eolian-mantled fan terraces (fan remnants). It benefits from run-in water from adjacent areas after high-intensity short-duration summer thunderstorms.

Soil features

The soils are very deep and well drained. They formed in eolium and alluvium derived from sandstone and shale. Surface textures include loamy sand. The subsoil has textures of fine sandy loam, clay loam, sandy clay loam, and loamy sand. Permeability is moderately slow. Available water holding capacity is high to very high. Runoff is slow, and the hazard of water erosion is moderate. The hazard of soil blowing is severe. The soils are moderately sodic (SAR 13-30), moderately saline (EC 8-16), and mildly to strongly alkaline (pH 7.4-9.0).

Shiprock SSA:

140 – Benally loamy sand, overblown

Additional information may be found in Section II of the Field Office Technical Guide.

Table 4. Representative soil features

Surface texture	(1) Loamy sand
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow

Soil depth	150 cm
Electrical conductivity (0-101.6cm)	10 – 20 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	10 – 30
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 10

Ecological dynamics

This site has a plant community made up primarily of midgrasses, shortgrasses, some shrubs, and a minor amount of forbs. The reference plant community contains a mixture of cool-season and warm-season grasses.

Plant species most likely to invade or increase on this site when it deteriorates are annual barley, Russian thistle, and other annual forbs. Continuous livestock grazing during winter and spring decreases the cool-season grasses and increases lower forage value grasses and shrubs.

The reference plant community has been determined by study of relict areas or areas protected from excessive grazing. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures, and historical accounts have also been used.

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	alkali sacaton			280-605	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	280-605	–
2	galleta			56-146	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	56-151	–
3	squirreltail			0-101	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0-101	–
4	Indian ricegrass			6-101	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	6-101	–
5	sand dropseed			6-45	
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	6-50	–
6	other perennial grasses			6-45	
Forb					
7	perennial forbs			6-34	
8	annual forbs			0-22	
Shrub/Vine					
9	fourwing saltbush			6-45	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	6-50	–

10	other shrubs		0-45
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Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.2 plant community composition

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

Livestock - This site is suitable for yearlong grazing by all classes of livestock, is easily traversed, and is well suited to planned grazing systems. Wildlife – This site is well used by wildlife that require digging and those which require open grassland.

Hydrological functions

Permeability is moderately slow. Available water holding capacity is high to very high. Runoff is slow, and the hazard of water erosion is moderate.

Recreational uses

This site is well suited to hunting, horseback riding, and wildlife observation. The fan terraces have a tremendous aesthetic appeal as grasslands.

Type locality

Location 1: San Juan County, NM	
Township/Range/Section	T22N R17W S7
General legal description	Sheep Springs Quad – 0.5 miles NE of Sheep Springs, NM – Navajo Reservation, NM.

Contributors

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Unknown

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)	
Contact for lead author	
Date	05/04/2026
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:

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

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

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

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:**

17. **Perennial plant reproductive capability:**
