

Ecological site R035XB016NM Clay Loam Terrace (Sodic) 7-10"

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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

This site occurs on low stream and fan terraces of valley floors and below mesas and cuestas. The soils are very deep and well drained, with textures that are quite variable*. The soils are moderately to very strongly alkaline (pH 7.9 - 9.6). They are very slightly to strongly saline (EC 2-16) and slightly to moderately sodic (SAR 5-30). *The site name would suggest that soils have clay loam textures, and we imagine this is the case most of the time. However, the Soil Features section includes such textures as fine sandy loam.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Atriplex obovata</i>
Herbaceous	(1) <i>Sporobolus airoides</i>

Physiographic features

This site occurs on low stream and fan terraces of valley floors and below mesas and cuestas. It may receive some additional run-in moisture from surrounding areas, but little benefit is realized because of the soil properties. Slopes range from 0 to 5 percent. Elevations range from 4,700 to 6,100 feet.

Table 2. Representative physiographic features

Landforms	(1) Stream terrace (2) Fan remnant
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	None to rare
Ponding frequency	None
Elevation	1,430 – 1,860 m

Slope	0 – 10 %
Water table depth	150 cm
Aspect	Aspect is not a significant factor

Climatic features

Mean annual precipitation varies from 7 to 10 inches. About 60% of this moisture comes as rain from April through October. May and June are the driest months. Most of the moisture from November through March comes as snow. Winds of high velocity during late winter and early spring are common.

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 degrees F and –17 degrees F have been recorded. 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% of the total precipitation is received during these summer months. The other 60%, received from fall through spring, influences cool-season plants.

Table 3 Representative climatic features

Frost-free period (average)	160 days
Freeze-free period (average)	170 days
Precipitation total (average)	250 mm

Influencing water features

This is an upland site, and is not associated with water features or wetlands. During heavy rain events, this site may receive run-on moisture from landforms above and contribute runoff to landforms below.

Soil features

The soils are very deep and well drained. They formed in alluvium derived from shale, siltstone, and sandstone. Surface textures include clay loam, sandy clay loam, silty clay loam, loam, and very fine sandy loam. The subsoil has textures of silty clay loam, silty clay, sandy clay loam, loam, clay loam, and fine sandy loam. Permeability is moderately to very slow. Available water capacity is low to moderate. Runoff is low to very high and the hazard of water erosion is slight to severe. The hazard of soil blowing is severe. The soils are moderately to very strongly alkaline (pH 7.9 - 9.6). They are very slightly to strongly saline (EC 2-16) and slightly to moderately sodic (SAR 5-30).

Characteristic taxonomic units are:

Shiprock SSA:

107-Tocito-Gullied land complex (Tocito part)

122-Blueflat-Notal Assoc. (Notal part)

160-Notal-Escavada-Riverwash assoc. (Notal part)

170-Notal sandy clay loam

177-Notal silty clay loam

200-Tocito loam

Other soils included are:

Table 4. Representative soil features

Surface texture	(1) Clay loam (2) Silty clay loam (3) Loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Very slow to moderately slow
Soil depth	150 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	15.24 cm
Calcium carbonate equivalent (0-101.6cm)	10 %
Electrical conductivity (0-101.6cm)	0 – 20 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	10 – 30
Soil reaction (1:1 water) (0-101.6cm)	7.9 – 9.6
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %

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

This ecological site has a plant community made up primarily of grasses, shrubs, and a small percentage of forbs. In the historic climax plant community, there are more warm-season grasses than cool-season grasses. The high sodium content in the soil determines many of the species that grow on the site.

Plant species most likely to invade or increase on this site when it deteriorates are black greasewood, Russian thistle, Powell's saltweed, and other annual weeds. When this site is continuously grazed yearlong, the desirable species will be replaced by less palatable plants. The sodium-adapted mound saltbush will increase as grass species decrease.

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			168-224	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	168-224	–
2	galleta			28-56	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	28-56	–
3	squirreltail			0-28	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0-28	–
4	other perennial grasses			0-28	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-28	–
Forb					
5	Powell's saltweed			0-11	
	Powell's saltweed	ATPO2	<i>Atriplex powellii</i>	0-11	–
6	perennial forbs			0-11	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-11	–
7	annual forbs			0-6	
	Forb, annual	2FA	<i>Forb, annual</i>	0-6	–
Shrub/Vine					
8	mound saltbush			112-140	
	mound saltbush	ATOB	<i>Atriplex obovata</i>	112-140	–
9	black greasewood			6-28	
	greasewood	SAVE4	<i>Sarcobatus vermiculatus</i>	6-28	–
10	Mojave seablite			0-17	
	Mojave seablite	SUMO	<i>Suaeda moquinii</i>	0-17	–
11	fourwing saltbush			0-28	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0-28	–
12	sickle saltbush			0-6	
	sickle saltbush	ATFA	<i>Atriplex falcata</i>	0-6	–
13	valley saltbush			0-6	
	valley saltbush	ATCU	<i>Atriplex cuneata</i>	0-6	–
14	other shrubs			0-17	

	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>		0-17	-
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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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Table 9. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 3.2 plant community composition

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

Competition between wildlife and cattle can be severe during all seasons. Plant community diversity is fair to good. This site provides important yearlong food and cover for wildlife. Brush management practices should maximize edge effect and allow for corridors to and from water.

Hydrological functions

This site normally receives approximately 7-10 inches annual precipitation. Most summer rainfall occurs as brief, sometimes heavy, thunderstorms. Slopes range from 0-5 percent. Runoff is low to very high, and the hazard of water erosion is low on soils with slopes 1 percent. As the slope increases to 5 percent, the potential for water erosion increases to very high. On sodic soils, erosion potential increases as sodium adsorbed on clay particles disperses and plugs soil pore spaces, thus decreasing water infiltration, percolation, and drainage.

Recreational uses

Wildlife observation, horseback riding, photography, and hiking can be enjoyed on this site. Care must be taken to prepare for hot, dry summers and cold winters.

Wood products

This site has no significant value for wood products.

Other products

This site is suitable for grazing by all classes of livestock during most seasons of the year. Planned grazing systems can be readily adapted to this site. This site is susceptible to wind erosion, particularly on overgrazed areas with little or no vegetation cover.

Inventory data references

The potential historic climax plant community has been determined by study of range 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.

Type locality

Location 1: San Juan County, NM

Township/Range/Section	T22N R16W S3
General legal description	Great Bend Quad, Navajo Reservation, NM

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)	
Contact for lead author	
Date	05/11/2026
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:
