

Ecological site R035XB021NM

Loamy Upland

7-10

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

This site occurs on very deep, well-drained soils on elevated stream terraces and fan remnants. Surface textures are fine sandy loam and sandy clay loam. Slopes range from 1 to 15 percent.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Atriplex canescens</i>
Herbaceous	(1) <i>Pleuraphis jamesii</i>

Physiographic features

This site occurs on gently undulating high stream terraces and fan remnants below mesas and cuestas. It does not benefit from run-in moisture from adjacent areas nor does it suffer from excessive loss from runoff. It occurs on all exposures. Slopes range from 1 to 15 percent. Elevations range from 4,900 to 6,300 feet.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Fan remnant (3) Valley side
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	None to rare
Elevation	1,490 – 1,920 m
Slope	0 – 20 %

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.

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 are formed in alluvium derived from sandstone, shale, and quartzite. Surface textures include fine sandy loam and sandy clay loam. The subsoil has textures of gravelly sandy clay loam, gravelly sandy loam, clay loam, fine sandy loam, sandy clay loam, loam, sandy loam, and very cobbly coarse sand. Permeability is moderate. Available water capacity is moderate to high. Runoff is very low to medium, and the hazard of water erosion is very slight to moderate. The hazard of soil blowing is moderate to severe. The soils are non- to slightly saline (EC 0-8); non- to slightly sodic (SAR 0-13); and slightly to strongly alkaline (pH 7.4-9.0).

Shiprock SSA:

- 155-Mesa fine sandy loam
- 195-Tewa fine sandy loam
- 210-Mack-Mesa fine sandy loam
- 270-Fruitland sandy clay loam
- 295-Mesa sandy clay loam

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam (2) Sandy clay loam (3) Clay loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to somewhat excessively drained
Permeability class	Slow to moderately slow
Soil depth	150 cm
Surface fragment cover $\leq 3''$	0 – 10 %
Surface fragment cover $> 3''$	Not specified
Available water capacity (0-101.6cm)	10.16 – 15.24 cm
Electrical conductivity (0-101.6cm)	0 – 10 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 10
Subsurface fragment volume $\leq 3''$ (Depth not specified)	0 – 50 %
Subsurface fragment volume $> 3''$ (Depth not specified)	0 – 40 %

Ecological dynamics

This ecological site has a plant community made up primarily of short- and mid-grasses mixed with shrubs and a small percentage of forbs. In the historic climax plant community, there is a mixture of cool- and warm-season grasses.

Plant species most likely to invade or increase on this site when it deteriorates are Russian thistle, annual weeds, galleta, alkali sacaton, Greene's rabbitbrush, and broom snakeweed. When this site is continuously grazed during winter and spring, cool-season grasses and palatable shrubs are replaced by lower value forage plants

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	galleta			101-123	
2	Indian ricegrass			45-78	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	28-56	–
3	squirreltail			22-56	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0-28	–
4	blue grama			22-56	
5	black grama			0-22	
	Powell's saltweed	ATPO2	<i>Atriplex powellii</i>	0-11	–
6	sand dropseed			0-11	
7	alkali sacaton			0-22	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	168-224	–
	Forb, annual	2FA	<i>Forb, annual</i>	0-6	–
8	Fendler's threeawn			0-6	
	mound saltbush	ATOB	<i>Atriplex obovata</i>	112-140	–
9	other perennial grasses			0-11	
	greasewood	SAVE4	<i>Sarcobatus vermiculatus</i>	6-28	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-28	–
Forb					
10	rose heath			0-6	
	Mojave seablite	SUMO	<i>Suaeda moquinii</i>	0-17	–
11	perennial forbs			6-11	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0-28	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-11	–
12	annual forbs			0-6	
	sickle saltbush	ATFA	<i>Atriplex falcata</i>	0-6	–
Shrub/Vine					
13	fourwing saltbush			22-45	
	valley saltbush	ATCU	<i>Atriplex cuneata</i>	0-6	–
14	Greene's rabbitbrush			0-11	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	0-17	–
15	winterfat			0-45	
16	broom snakeweed			0-11	
17	shadscale saltbush			0-6	
18	Bigelow rubber rabbitbrush			0-6	
19	other shrubs			0-11	

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 1.3 plant community composition

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

This site provides habitat for numerous species of wildlife. Common mammals include coyote, gray fox, badger, porcupine, black-tailed jackrabbit, desert cottontail, Gunnison’s prairie dog, Steven’s woodrat, western harvest mouse, banner-tailed kangaroo rat, deer mouse, and pallid bat. A few of the common birds include mourning dove, cliff swallow, rock wren, and black-throated sparrow. The plains spadefoot toad is an amphibian common to the site. Reptiles include collared lizard, side-blotched lizard, gopher snake, and prairie rattlesnake. The shrub component native to this site furnishes valuable browse and provides multi-layered thermal, nesting, and hiding cover for many species.

Hydrological functions

This site normally receives approximately 7-10 inches of precipitation annually. Most summer rainfall occurs as brief, sometimes heavy, thunderstorms. Slopes range from 1-15 percent. Runoff is very low to medium, and the hazard of water erosion is very slight to moderate. As basal cover and litter are reduced, and the size of gaps between vegetation increases, surface soils become exposed to accelerated erosion. Pedestals, rills, and gullies may form.

Recreational uses

The natural rugged beauty of this site lends itself to outdoor activities such as sightseeing, bird-watching, wildlife photography, hiking, and horseback riding. 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 yearlong grazing by all classes of livestock and is easily traversed. It will respond quickly to a system of grazing. This site is susceptible to erosion, particularly overgrazed areas, old roads, cattle trails, and concentration areas.

Other information

N/A

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	T23N R19W S2
General legal description	Tsin Nas Kid topographic quadrangle – about 2.5 miles NW of Two Grey Hills, NM. Navajo Indian Reservation

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	05/05/2026
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:
