USDA Natural Resources
Conservation Service

Ecological site R035XB030NM
Sandy Loam Upland 6-10"

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.

Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Ecological site concept

This site occurs on very deep, well-drained soils. Surface textures include loamy fine sand and fine sandy loam. Landforms include elevated stream terraces, fan remnants, and cuestas. Slopes range from 1 to 8 percent.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex canescens* (2) *Krascheninnikovia lanata*
Herbaceous	(1) *Achnatherum hymenoides*

Physiographic features

This site occurs on treads of high stream terraces, fan remnants of undulating plateaus, 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 8 percent. Elevations range from 4,700 to 6,100 feet.

Table 2. Representative physiographic features

Landforms	(1) Fan remnant (2) Cuesta (3) Dip slope
Flooding frequency	None
Ponding frequency	None
Elevation	1,433–1,859 m
Slope	1–8%
Water table depth	152 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 temperature for the hottest month, July, is about 83 degrees F. Mean temperature for the coldest month, January, is about 27 degrees F. Extreme temperatures of 104 degrees F 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. During June, July, August, and September, the warm-season plants make optimum growth taking advantage of the warm temperature and moisture 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 during the fall-winter-

spring months influences cool-season plants.

Table 3. Representative climatic features

Frost-free period (average)	160 days
Freeze-free period (average)	165 days
Precipitation total (average)	254 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 and eolium derived from sandstone. Surface textures include loamy fine sand and fine sandy loam. The subsoil has textures of very fine sandy loam, fine sandy loam, loamy coarse sand, and loamy sand. Permeability is moderately rapid. Available water holding capacity is low to moderate. Runoff is very low to low, and the hazard of water erosion is very slight to slight. The hazard of soil blowing is severe. The soils are slightly to strongly alkaline (pH 7.4-9.0), nonsaline to slightly saline below 24 inches (EC 0-8), and nonsodic to slightly sodic (SAR 0-13).

Characteristic taxonomic units are:
Shiprock SSA:
120-Nageezi-Denazar (Nageezi part)
173-Shiprock fine sandy loam
205-Shiprock-Farb Complex (Shiprock part)
240-Nageezi loamy fine sand
Other soils included are:

Table 4. Representative soil features

Surface texture	(1) Loamy fine sand (2) Fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately rapid
Soil depth	152–170 cm

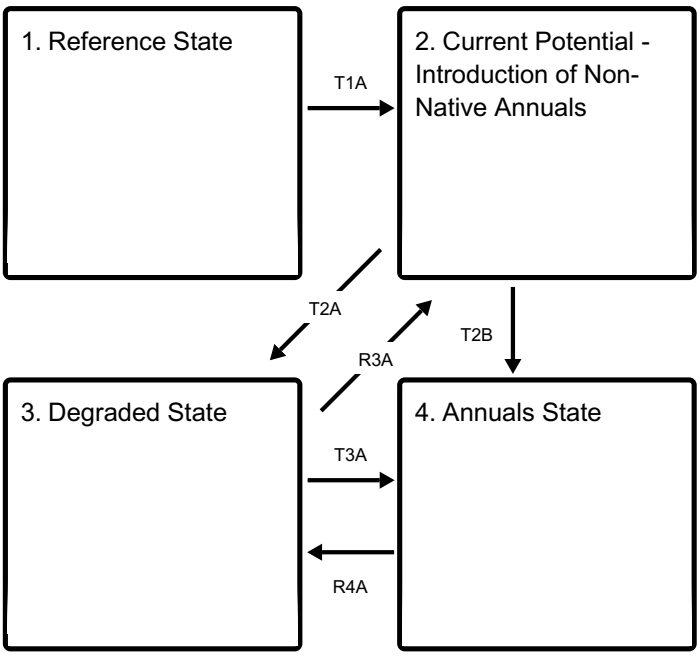
Surface fragment cover <=3"	0–8%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	10.16–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	1–30%
Electrical conductivity (0-101.6cm)	0–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–13
Soil reaction (1:1 water) (0-101.6cm)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

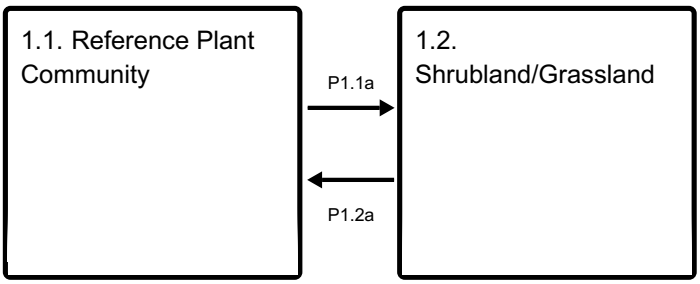
This site has a plant community made up primarily of short- and mid-grasses, some shrubs, and a small percentage of forbs. In the original plant community there is a mixture of both cool- and warm-season grasses. Plant species most likely to invade or increase on this site when it deteriorates are cheatgrass and other annual weeds, sixweeks fescue, galleta, and broom snakeweed. Continuous livestock grazing during winter and spring will decrease the cool-season grasses, which are replaced by lower forage value grasses and shrubs

State and transition model

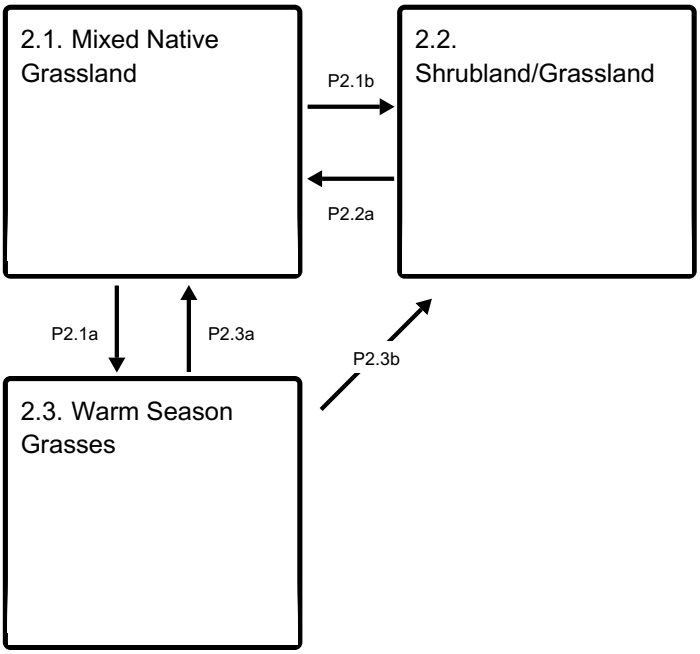
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Reference State

Community 1.1

Reference Plant Community

This site has a plant community made up primarily of short- and mid-grasses, some shrubs, and a small percentage of forbs. In the original plant community there is a mixture of both cool- and warm-season grasses. Plant species most likely to invade or increase on this site when it deteriorates are cheatgrass and other annual weeds, sixweeks fescue, galleta, and broom snakeweed. Continuous livestock grazing during winter and spring will decrease the cool-season grasses, which are replaced by lower forage value grasses and shrubs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	269	359	493
Shrub/Vine	50	67	92
Forb	11	22	34
Total	**330**	**448**	**619**

Figure 5. Plant community growth curve (percent production by month). NM0380, R035XB030NM-Sandy Loam Upland 6 to 10 inch-Reference State. R035XB030NM-Sandy Loam Upland 6 to 10 inch-Reference State.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
6	6	7	6	6	5	11	14	12	12	8	7

Community 1.2
Shrubland/Grassland

This phase is a relatively balanced mix of shrubs and native grasses.

Pathway P1.1a
Community 1.1 to 1.2

Season-long grazing providing little rest and recovery for preferred grazed plants during critical growing periods, coupled with high utilization.

Pathway P1.2a
Community 1.2 to 1.1

Prescribed grazing.

Conservation practices

Prescribed Grazing

State 2
Current Potential - Introduction of Non-Native Annuals

This phase is characterized by an established community of invasive annuals.

Community 2.1
Mixed Native Grassland

This phase contains a mix of native grasses.

Community 2.2
Shrubland/Grassland

This phase is a relatively balanced mix of shrubs and grasses.

Community 2.3
Warm Season Grasses

This phase is dominated by warm season grasses.

Pathway P2.1b
Community 2.1 to 2.2

Season-long grazing providing little rest and recovery for preferred grazed plants during critical growing periods, coupled with high utilization.

Pathway P2.1a
Community 2.1 to 2.3

Continuous cool-season grazing providing little rest and recovery for preferred grazed plants during critical growing periods, coupled with high utilization.

Pathway P2.2a
Community 2.2 to 2.1

Prescribed grazing

Conservation practices

Prescribed Grazing

Pathway P2.3a
Community 2.3 to 2.1

Prescribed grazing

Conservation practices

Prescribed Grazing

Pathway P2.3b
Community 2.3 to 2.2

Shrub encroachment

Conservation practices

Prescribed Grazing

State 3
Degraded State

This state exhibits evidence of degradation such as excessive bare ground.

State 4
Annuals State

This state is dominated by invasive annuals.

Transition T1A
State 1 to 2

Season-long grazing providing little rest and recovery for preferred grazed plants during critical growing periods, coupled with high utilization.

Transition T2A
State 2 to 3

Season-long grazing providing little rest and recovery for preferred grazed plants during critical growing periods, coupled with high utilization.

Transition T2B
State 2 to 4

Season-long grazing providing little rest and recovery for preferred grazed plants during critical growing periods, coupled with high utilization. Establishment of invasive annuals.

Restoration pathway R3A

State 3 to 2

Prescribed grazing, seeding

Conservation practices

Range Planting
Prescribed Grazing

Transition T3A
State 3 to 4

Establishment of invasive annuals.

Restoration pathway R4A
State 4 to 3

Prescribed grazing, seeding

Conservation practices

Range Planting
Prescribed Grazing
Herbicide resistant weed management

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Indian ricegrass**			112–157	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	112–157	–
2	**galleta**			45–67	
	James' galleta	PLJA	*Pleuraphis jamesii*	45–67	–
3	**blue grama**			22–45	
	blue grama	BOGR2	*Bouteloua gracilis*	22–45	–
4	**sand dropseed**			0–11	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–9	–
5	**Fendler's threeawn**			0–11	

	Fendler's threeawn	ARPUF	*Aristida purpurea var. fendleriana*	0–9	–
6	**Fendler (red) threeawn**			0–6	
	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	0–4	–
7	**squirreltail**			11–22	
	squirreltail	ELEL5	*Elymus elymoides*	9–22	–
8	**mesa dropseed**			0–11	
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	0–13	–
9	**sandhill muhly**			0–6	
	sandhill muhly	MUPU2	*Muhlenbergia pungens*	0–4	–
10	**other perennial grasses**			0–11	
	Grass, perennial	2GP	*Grass, perennial*	0–13	–
Forb					
11	**rose heath (smallflower aster)**			0–11	
	rose heath	CHER2	*Chaetopappa ericoides*	0–9	–
12	**globemallow**			0–6	
	globemallow	SPHAE	*Sphaeralcea*	0–4	–
13	**other perennial forbs**			0–11	
	Forb, perennial	2FP	*Forb, perennial*	0–13	–
14	**annual forbs**			0–11	
Shrub/Vine					
15	**fourwing saltbush**			6–22	
	fourwing saltbush	ATCA2	*Atriplex canescens*	4–22	–
16	**winterfat**			0–22	
17	**plains pricklypear**			0–6	
	plains pricklypear	OPPO	*Opuntia polyacantha*	0–4	–
18	**Greene's rabbitbrush**			0–6	
	Greene's rabbitbrush	CHGR6	*Chrysothamnus greenei*	0–4	–
19	**broom snakeweed**			6–22	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	4–22	–
20	**other shrubs**			0–11	

	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–9	–

Animal community

This site is well used by wildlife that dig or burrow and those which require open grassland.

Hydrological functions

This site normally receives about 7-10 inches of annual precipitation. Most summer rainfall occurs as brief, sometimes heavy, thunderstorms. Slopes range from 1-8 percent. Permeability is moderately rapid. Runoff is very low to low, and the hazard of water erosion is very slight to slight.

Recreational uses

Open grasslands of the undulating plateaus and cuestas of this site are aesthetically appealing and provide recreational activities such as hunting, horseback riding, and wildlife observation.

Wood products

This site has no significant value for wood products.

Other products

Grazing: This site is suitable for yearlong grazing by all classes of livestock. Grazing systems adapt well to this site and should be used. This site is susceptible to erosion, particularly overgrazed areas, old roads, cattle trails, and high-use areas.

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	T25N R17W S15

General legal description	Little Water Topographic Quadrangle – 5 miles ESE of Little Water, NM Section 15, Township 25N, Range 17W – 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	05/21/2025
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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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:

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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:**
