Ecological site R035XB009NM
Shale Hills

Accessed: 05/12/2026

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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on gently sloping to moderately steep low hills and mesa side slopes. Oftentimes it is associated with shale badlands and sandstone rock outcrops. Exposures are variable. Slopes range from 15 to 45 percent. Elevations range from 5,600 to 6,800 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Hill
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Occasional
Elevation	1,710 – 2,070 m
Slope	20 – 50 %
Water table depth	110 – 180 cm
Aspect	Aspect is not a significant factor

Climatic features

This site has an arid, mild, dry climate with distinct seasonal temperature variations and large annual and diurnal temperature changes.

Mean annual precipitation varies from about 7 to 10 inches. Deviations of 4 inches or more are quite common. Distribution is 65% during the native-plant growth period, which is from April through September. May and June are the dry months. During July, August, and September, 3.5 inches of precipitation influences the presence and production of warm-season plants. Late-fall and winter moisture is conducive to the production of cool-season plants, which usually begin growth in March and end with plant maturity and seed dissemination. This usually takes place in the early part of June when the moisture deficiency and warmer temperatures occur. The Gulf of Mexico is the principal source of moisture for summer precipitation, which is characterized by brief afternoon thunderstorms. Winter moisture occurs as light rain or snow.

Temperatures vary from a monthly mean of 75 degrees F in July to 27 degrees F in January, and from an annual maximum of 106 degrees F to an annual minimum of -35 degrees F. The average last killing frost in the spring is May 8, and the average first killing frost in the fall is October 10. The frost-free season is approximately 160 days. Temperatures are conducive to native grass and forb growth from April through September. Maximum shrub growth occurs in the spring months.

The wind blows most frequently from an easterly direction; however, a majority of the stronger winds (10 to 25 miles per hour) are from a westerly quadrant. Spring is the windiest season. Average hourly wind velocities are near 6 miles per hour. Spring and summer winds increase transpiration rates of native plants and rapidly dry the surface soil. Small soil particles are often displaced by the wind near the soil surface and often results in structural damage to native plants, especially young seedlings.

Climate data were obtained from http://www.wrcc.sage.dri.edu/summary/climsmnm.html web site using 50% probability for freeze-free and frost-free seasons using 28.5 degrees F and 32.5 degrees F, respectively.

Table 3 Representative climatic features

Frost-free period (average)	150 days
Freeze-free period (average)	180 days
Precipitation total (average)	250 mm

Influencing water features

This site is not influenced by water from a wetland or stream.

Soil features

The soils are moderately deep to deep and moderately well drained. Surface textures range from very fine sandy loams, loams, and clay loams. Subsoils are generally fine-textured.

The soils on this site are delicate and very susceptible to erosion by wind and water. Dissection of the site by gullies is common.

Water intake is slow, permeability is slow, but water-holding capacity is moderate to high.

Table 4. Representative soil features

Surface texture	(1) Very fine sandy loam (2) Loam (3) Clay loam
Family particle size	(1) Clayey
Drainage class	Somewhat poorly drained to moderately well drained

Permeability class	Slow to moderately slow
Soil depth	150 – 180 cm
Available water capacity (0-101.6cm)	7.62 – 15.24 cm
Electrical conductivity (0-101.6cm)	0 – 10 mmhos/cm
Soil reaction (1:1 water) (0-101.6cm)	7.9 – 10
Subsurface fragment volume <=3" (Depth not specified)	20 – 40 %
Subsurface fragment volume >3" (Depth not specified)	20 – 40 %

Ecological dynamics

The vegetation on this site presents a scrub juniper/pinyon savannah aspect understoried by a variety of shrubs, half-shrubs, grasses, and forbs. North slopes support more trees than south slopes, which are fairly open.

Other species include: sandhill muhly, sixweeks fescue, mat muhly, brome grasses, Russian thistle, kochia, fleabane, cholla cactus, yucca spp., and black greasewood.

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				96-129	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	96-129	–
	needle and thread	HECO26	*Hesperostipa comata*	96-129	–
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	96-129	–
2				96-129	
	blue grama	BOGR2	*Bouteloua gracilis*	96-129	–
	James' galleta	PLJA	*Pleuraphis jamesii*	96-129	–
3				65-96	
	alkali sacaton	SPAI	*Sporobolus airoides*	65-96	–
4				19-52	

	prairie Junegrass	KOMA	*Koeleria macrantha*	19-52	–
	muttongrass	POFE	*Poa fendleriana*	19-52	–
5				19-45	
	squirreltail	ELEL5	*Elymus elymoides*	19-45	–
	western wheatgrass	PASM	*Pascopyrum smithii*	19-45	–
6				19-45	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	19-45	–
	wheatgrass	PASCO	*Pascopyrum*	19-45	–
	dropseed	SPORO	*Sporobolus*	19-45	–
Forb					
7				7-19	
	buckwheat	ERIOG	*Eriogonum*	7-19	–
8				7-19	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	7-19	–
	scarlet Indian paintbrush	CACO17	*Castilleja coccinea*	7-19	–
	locoweed	OXYTR	*Oxytropis*	7-19	–
Tree					
9				33-96	
	juniper	JUNIP	*Juniperus*	33-96	–
	twoneedle pinyon	PIED	*Pinus edulis*	33-96	–
Shrub/Vine					
10				33-65	
	hairy mountain mahogany	CEMOP	*Cercocarpus montanus var. paucidentatus*	33-65	–
	Mexican cliffrose	PUME	*Purshia mexicana*	33-65	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	33-65	–
11				19-45	
	big sagebrush	ARTR2	*Artemisia tridentata*	19-45	–
	rabbitbrush	CHRYS9	*Chrysothamnus*	19-45	–
12				19-45	
	fourwing saltbush	ATCA2	*Atriplex canescens*	19-45	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	19-45	–
13				0-19	
	Shrub, deciduous	2SD	*Shrub, deciduous*	0-19	–

Animal community

Habitat for Wildlife: No Data

Hydrological functions

The runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups. Hydrologic Interpretations Soil Series----------Hydrologic Group Green River----------B Walrees----------C

Recreational uses

This site is suited to hunting, hiking, horseback riding, photography, and nature observation. It is stark but scenic due to its association with colorful soils and rock outcrops.

Wood products

Wood products include fuelwood and fence posts. Care in harvesting these products should be taken due to the delicacy of the soils.

Other products

Grazing: Approximately 70 percent of the vegetative production on this site is suitable for grazing or browsing by domestic livestock and wildlife. Grazing distribution can be a problem if adequate watering, salt locations, and fencing is not provided. A decrease in cool-season grasses (Indian ricegrass, needle-and-thread and muttongrass) and fourwing saltbush, and an increase in blue grama, galleta, big sagebrush, rabbitbrush, and juniper indicate deterioration of the potential plant community. Severe deterioration is indicated by a large void of herbaceous species. Due to the delicacy of the site, a planned grazing system, which would provide periodic grazings and rests, should be implemented. This would provide more cover for the soil as well as more nutritious and higher-producing forage for the grazing animals.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month Similarity Index--------Ac/AUM 100 - 76----------4.5 – 6.1 75 – 51----------6.0 – 9.1 50 – 26----------9.0 – 18.2 25 – 0----------18.2+

Type locality

Location 1: San Juan County, NM

Other references

Data collection for this site was done in conjunction with the progressive soil surveys within the San Juan River Valley, Mesas and Plateaus, Major Land Resource Area 35 of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: San Juan, McKinley.

Characteristic soils are:
Green River

Contributors

Don Sylvester
Elizabeth Wright
John Tunberg
Michael Carpinelli

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	
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:**
