

Ecological site R077BY005NM Shallow Sandstone

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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.

Classification relationships

Characteristic Soils Are:

Rizozo

Travessilla

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site is on gently sloping to moderately steep canyon walls, hillsides and mesa tops at elevations of 5,500 to 7,500 feet above sea level. The landscape is typically a complex of small pockets of soil and sandstone outcrop in the form of ledges and escarpments.

Slopes are usually 5 to 15 percent but may range 0 to 25 percent with inclusions of short, steeper slopes.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mesa
Elevation	1,676–2,286 m
Slope	0–25%
Aspect	Aspect is not a significant factor

Climatic features

The climate of this area is classified as “semi-arid continental”.

Precipitation averages 14 to 16 inches. Seventy seven percent of the year’s moisture normally falls during the period of May through October. Practically all of it is brought by brief afternoon and evening thunderstorms. In July and August, normally the wettest months of the year, one can expect about on day in five when rainfall exceeds one-tenth inch. Early spring precipitation in May benefits the cool-season plants. Winter precipitation, supplying 24 percent of the year’s moisture, normally has no more than two days a month with as much as one-tenth inch of moisture. Much of the winter precipitation falls as snow.

Air temperatures vary from a monthly mean of 20 degrees F in January to 69 degrees F in July. Daily high temperatures average in the 80’s and low 90’s during the summer. Winter low temperatures fall below the freezing mark much of the time from November through March with minimum temperatures approaching 25 degrees F below zero. Dates of the last killing frost may vary from May 9th through May 17th, and the first killing frost from September 27th to October 8th. The frost-free season ranges from 141 days to 153 days from early May to early October.

Wind velocities for the area average 10 to 12 miles per hour and prevail from the south and southwest. Generally, March is the windiest month. Strong winds during the spring cause rapid drying of the soil surface. Nearby mountains to the west intercept much of the precipitation from the Pacific storms coming through this area during the winter. About 70 percent of the 14 to 16 inches of annual precipitation falls in the form of rainfall during the frost-free season. About 40 percent of the annual precipitation benefits cool-season plants, 50 percent benefits warm-season plants, and 10 percent falls during the season of plant dormancy. Relative humidity is moderately low. The sun shines approximately 75 percent of the time. Climate data was 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)	149 days
Freeze-free period (average)	171 days
Precipitation total (average)	406 mm

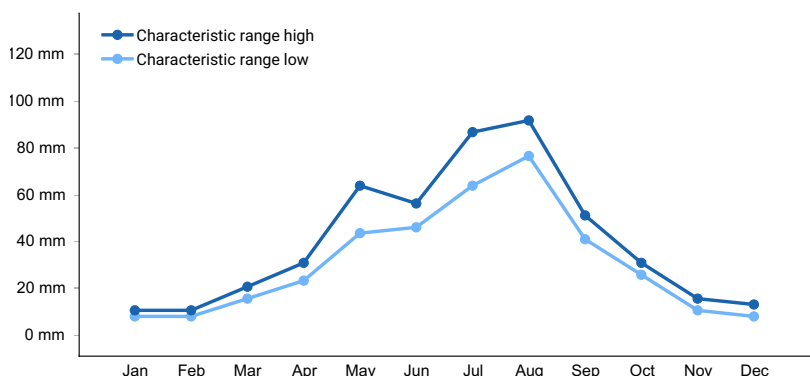


Figure 1. Monthly precipitation range

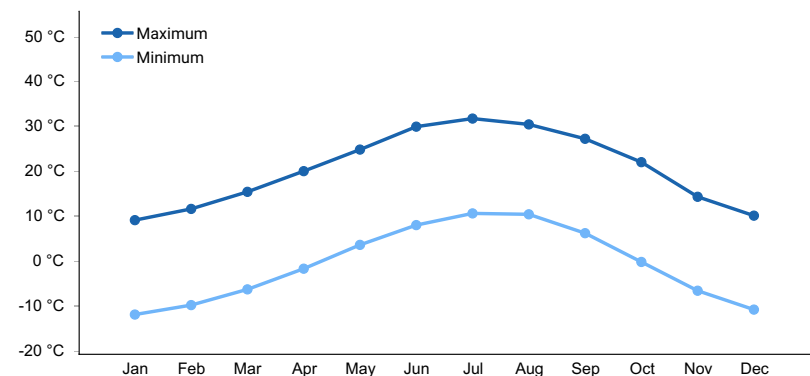


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

These are well drained, shallow soils on sandstone bedrock. The surface texture is fine sandy loam, loam, silt loam or the channery, flaggy, or stony types of these textures. The texture of the subsurface layers is flaggy or stony loam to clay loam. Sandstone bedrock is at depths of less than 20 inches. Permeability is moderate. The available water-holding capacity is low. Effective rooting depth is 6 to 20 inches. Air-water relationship is favorable for plant growth. Rock fragments make up 5 to 35 percent of the soil profile and occupy 0 to 25 percent of the surface.

Characteristic Soils Are:
Rizozo

Table 4. Representative soil features

Surface texture	(1) Stony loam (2) Channery sandy loam (3) Flaggy
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow to moderate
Soil depth	10–51 cm
Surface fragment cover ≤3"	15–35%
Surface fragment cover >3"	15–35%
Available water capacity (0–101.6cm)	7.62–15.24 cm
Electrical conductivity (0–101.6cm)	0–2 mmhos/cm
Soil reaction (1:1 water) (0–101.6cm)	6.6–8.4
Subsurface fragment volume ≤3" (Depth not specified)	15–35%
Subsurface fragment volume >3" (Depth not specified)	15–35%

Ecological dynamics

State and transition model

Ecosystem states

1. Historic Climax Plant Community

State 1 submodel, plant communities

1.1. Historic Climax Plant Community

State 1 Historic Climax Plant Community

Community 1.1 Historic Climax Plant Community

On this site the dominant vegetation is grass. Small trees and shrubs are associated with the very shallow soils near the bare ledges or rock outcrops. Mid-grasses such as sideoats grama and little bluestem are dominant with scattered junipers or shrubs. Several species of perennial and annual forbs are evenly distributed. Other grasses that could appear on this site include: slender tridens, threeawn spp., and ring muhly. Other shrubs include: broom

snakeweed, winterfat and cholla. Other forbs include: locoweed spp., globemallow spp., dalea, silverleaf nightshade, peavine, paintbrush spp., gilia, rayless goldenrod, and prairie coneflower.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	393	897	1399
Shrub/Vine	66	149	233
Forb	16	35	54
Total	475	1081	1686

Table 6. Ground cover

Tree foliar cover	5-10%
Shrub/vine/liana foliar cover	1-5%
Grass/grasslike foliar cover	10-15%
Forb foliar cover	1-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	1-5%
Surface fragments >0.25" and <=3"	1-5%
Surface fragments >3"	20-25%
Bedrock	0%
Water	0%
Bare ground	30-35%

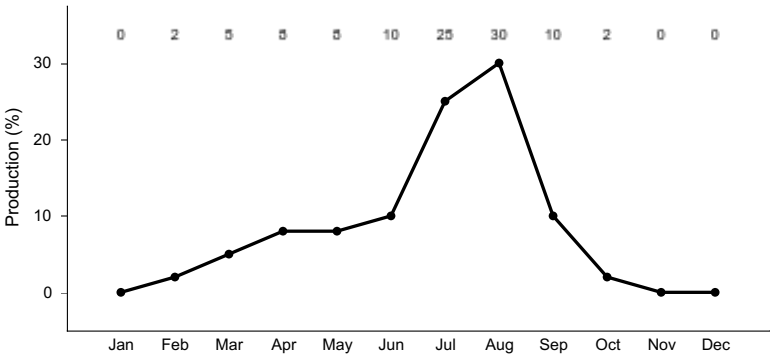


Figure 4. Plant community growth curve (percent production by month). NM4705, R077BY005NM Shallow Sandstone Reference State. R077BY005NM Shallow Sandstone Reference State.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Sideoats grama			287–345	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	287–345	–
2	Little bluestem			230–287	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	230–287	–
3	Blue and hairy grama			0–287	

3	Blue and hairy grama			0–201	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–287	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0–287	–
4	Needleandthread NM feathergrass			0–115	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	0–115	–
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	0–115	–
5	Big bluestem			57–115	
	big bluestem	ANGE	<i>Andropogon gerardii</i>	57–115	–
6	Silver bluestem pinion ricegrass			35–57	
	silver bluestem	BOSA	<i>Bothriochloa saccharoides</i>	35–57	–
	pinion ricegrass	PIFI	<i>Piptochaetium fimbriatum</i>	35–57	–
7	Wolftail			35–57	
	common wolftail	LYPH	<i>Lycurus phleoides</i>	35–57	–
8	Bottlebrush squirreltail			11–57	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	11–57	–
9	perennial grasses spp.			35–57	
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	35–57	–
Forb					
10	Wild buckwheat			24–57	
	buckwheat	ERIOG	<i>Eriogonum</i>	24–57	–
11	Aster spp.			24–57	
	aster	ASTER	<i>Aster</i>	24–57	–
12	Perennial forbs spp.			24–57	
	Forb, perennial	2FP	<i>Forb, perennial</i>	24–57	–
13	Annual forb spp.			24–57	
	Forb, annual	2FA	<i>Forb, annual</i>	24–57	–
Shrub/Vine					
14	Cudweed and Fringed sagewort			0–57	
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0–57	–
	Pacific alpine wormwood	ARGL9	<i>Artemisia glomerata</i>	0–57	–
15	Oak spp.			24–57	
	oak	QUERC	<i>Quercus</i>	24–57	–
16	Skunkbush sumac Hairy mountainmahogany			0–57	
	hairy mountain mahogany	CEMOP	<i>Cercocarpus montanus var. paucidentatus</i>	0–57	–
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	0–57	–
18	Other shrubs spp.			24–57	
	Shrub, deciduous	2SD	<i>Shrub, deciduous</i>	24–57	–
Tree					
17	Juniper spp. and Pinion pine			0–57	
	juniper	JUNIP	<i>Juniperus</i>	0–57	–
	twoneedle pinyon	PIED	<i>Pinus edulis</i>	0–57	–

Animal community

Habitat for Wildlife:

This site provides habitats which support a resident animal community that is characterized by mule deer, coyote, bobcat, bridled weasel, black-tailed jackrabbit, thirteen-lined ground squirrel, rock squirrel, ferruginous hawk, canyon wren, prairie rattlesnake and the red spotted toad.

The great horned owl and the prairie falcon nest in these habitats if suitable rock cliffs occur.

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

Rizozo-----D

Travessilla----D

Recreational uses

This site has fair esthetic appeal and natural beauty. It has a variety of plants that bloom from early spring to late summer. Fair for camping, hiking and picnicking. Hunting is fair for deer and rabbits.

Wood products

Production of juniper and pinyon provides limited amounts of firewood and fence posts.

Other products

Grazing:

This site can be grazed any season of the year by all classes and kinds of livestock. Because of the slopes and rock outcrops, a younger class of livestock utilize this site best. Browsing animals may be favored because of the site's potential to produce shrubs and forbs. Continuous grazing during the grazing season will cause the more desirable forage plants such as sideoats grama, little bluestem, New Mexico feathergrass, big bluestem and pinyon ricegrass to decrease. Species most likely to increase are blue grama, oneseed juniper, ring muhly, oak brush and cholla cactus. As the ecological condition deteriorates, it is accompanied by a sharp increase in juniper, which may give the appearance of dominating the site. Small patches of oak brush will also increase to the point where it may dominate. A system of deferred grazing that varies the time of grazing and rest in a pasture during successive years is needed to maintain or improve the plant community. A late winter, early summer rest is beneficial to shrubby species such as winterfat and mountainmahogany. Rest during April, May and June is beneficial to New Mexico feathergrass, needleandthread and pinyon ricegrass. This site provides a large variety of grasses, forbs and shrubs that provide a well-balanced feed and good nutrition for all grazing animals.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index----Ac/AUM

100 - 76-----3.0 – 3.8

75 – 51-----3.7 – 4.7

50 – 26-----4.6 – 12.0

25 – 0-----12.0+

Type locality

Location 1: Mora County, NM
Location 2: San Miguel County, NM

Other references

Data collection for this site was done in conjunction with the progressive soil surveys within the Pecos-Canadian Plains and Valleys 70 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Colfax, Mora, San Miguel, Union.

Contributors

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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:**
-