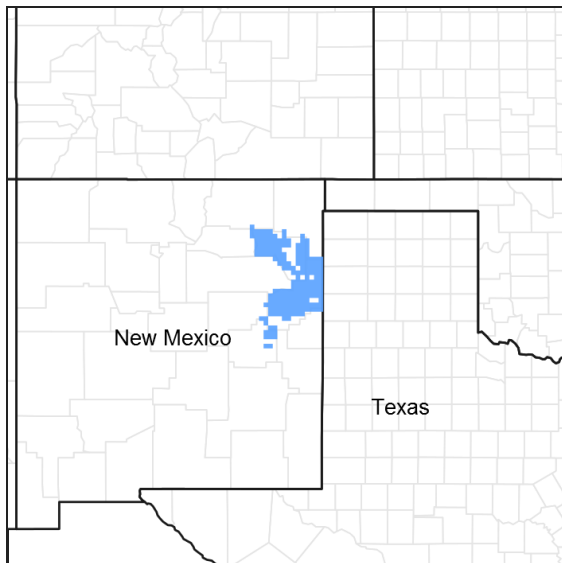


# Ecological site R077BY031NM Shallow

Accessed: 05/02/2024

## 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.

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

## Physiographic features

This site occurs on the convex position of low ridges between deeper soils and swales. The site is on nearly level to gently undulating landscapes of the uplands. Slopes range from 0 to 9 percent but usually less than 5 percent. Direction of slope varies and composition of plant community may vary. Elevation ranges from 4,300 to 5,300 feet above sea level.

**Table 2. Representative physiographic features**

Landforms	(1) Ridge
Elevation	1,311–1,615 m
Slope	0–9%
Aspect	N, S

## Climatic features

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

Annual average precipitation ranges from 15 to 19 inches. Seventy percent of the moisture usually falls during the six-month period May through October. Most of this summer precipitation falls in the form of brief and heavy afternoon and evening thunderstorms. Hail may accompany the more severe summer storms. Spring precipitation (March, April, May) accounts for approximately 25 percent of the annual precipitation. Most of this comes as light rain showers. Winter moisture may occur as either rain or snow and usually averages less than ½ inch per month.

Temperatures are characterized by distinct seasonal change and large annual and diurnal temperature ranges. Summers are moderately warm; maximum temperatures average above 90 degrees F in July and August. Temperatures usually fall rapidly after sundown and range in the low 60's on most summer nights. Winters are mild, sunny and dry. Daytime shade temperatures in mid-winter usually rise to the 50's. However, freezing temperatures normally occur at night from mid-November to mid-March.

The frost-free season ranges from 181 to 199 days. Dates of the last freeze vary from April 10th to April 23rd and the first freeze varies from October 18th to October 26th.

Wind velocities in this area are high and average about 5.3 miles per hour on an annual basis. The spring months are characterized by frequent windstorms with velocities in excess of 45 miles per hour, which cause excessive erosion on soils not protected by a good ground cover of vegetation. Humidity is low and evaporation is high.

Both temperature and rainfall distribution favor production of warm-season, perennial plants in this area. However, sufficient late winter and early spring moisture allows cool-season species to occupy an important component within most plant communities.

Climate data was obtained from the WCCR web site. Using 50% probabilities for freeze-free and frost-free seasons at 28.5 degrees F and 32.5 degrees F respectively.

**Table 3. Representative climatic features**

Frost-free period (average)	183 days
Freeze-free period (average)	202 days
Precipitation total (average)	483 mm

## Influencing water features

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

## Soil features

These are well-drained, very shallow soils over petrocalcic layers and hard, platy caliche layers. The surface textures are gravelly loam, fine sandy loam and gravelly fine sandy loam. The textures of the subsurface layers are fine sandy loam, loam, gravelly loam and gravelly fine sandy loam. The caliche and petrocalcic layers are normally at depths less than 10 inches. Permeability is moderate above the petrocalcic and caliche layers. The available water-holding capacity is moderate to high. The effective rooting depth is 10 inches or less. The plant-soil-air-water relationship is good. The very shallow petrocalcic and caliche layers hold water up available to shallow rooted, rhizomatous and stoloniferous short and mid-grass for short periods of time, followed by rapid drying of the soil. If unprotected, plant cover and organic residues become wind blown and easily eroded.

**Table 4. Representative soil features**

Surface texture	(1) Gravelly fine sandy loam (2) Loam
Family particle size	(1) Loamy

Drainage class	Well drained
Permeability class	Slow to moderate
Soil depth	25–102 cm
Surface fragment cover <=3"	15–35%
Available water capacity (0-101.6cm)	15.24–30.48 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)	35–60%
Subsurface fragment volume >3" (Depth not specified)	15–35%

## Ecological dynamics

### State and transition model

#### Ecosystem states

1. Historic Climax Plant Community
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#### State 1 submodel, plant communities

1.1. Historic Climax Plant Community
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### State 1

#### Historic Climax Plant Community

#### Community 1.1

#### Historic Climax Plant Community

Historic Climax Plant Community This site is a grassland dominated by warm-season short and mid-grasses with an occasional half-shrub or shrub. Forbs and woody species generally make up less than 20 percent of the plant community. Cool-season grasses and forbs make up a minor component of the community and are mainly on the north-facing slopes. Black grama is on the south-facing slopes.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	476	810	1334
Forb	56	95	157
Shrub/Vine	28	48	78
<b>Total</b>	<b>560</b>	<b>953</b>	<b>1569</b>

**Table 6. Ground cover**

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

**Figure 5. Plant community growth curve (percent production by month). NM4731, R077BY031NM Shallow Reference State. R077BY031NM Shallow Reference State.**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	3	3	5	5	25	30	15	8	4	0

## Additional community tables

**Table 7. Community 1.1 plant community composition**

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Blue Grama, Hairy Grama</b>			143–163	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	143–163	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	143–163	–
2	<b>Sideoats Grama</b>			143–163	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	143–163	–
3	<b>Little Bluestem</b>			143–163	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	143–163	–
4	<b>Black Grama</b>			76–95	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	76–95	–
5	<b>New Mexico Feathergrass, Needleandthread</b>			76–95	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	76–95	–
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	76–95	–
6	<b>Sand Dropseed</b>			29–48	
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	29–48	–
7	<b>Ring Muhly, Threawn spp.</b>			29–48	
	threawn	ARIST	<i>Aristida</i>	29–48	–
	ring muhly	MUTO2	<i>Muhlenbergia torreyi</i>	29–48	–
8	<b>Hairy Tridens, Slim Tridens</b>			29–48	
	hairy woollygrass	ERPI5	<i>Erioneuron pilosum</i>	29–48	–

	slim tridens	TRMU	<i>Tridens muticus</i>	29-48	-
9	<b>Silver Bluestem, Wolf tail</b>			29-48	
	silver bluestem	BOSA	<i>Bothriochloa saccharoides</i>	29-48	-
	common wolf tail	LYPH	<i>Lycurus phleoides</i>	29-48	-
10	<b>Other Grasses</b>			29-48	
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	29-48	-
<b>Forb</b>					
11	<b>Leather Croton, Berberis, Globemallow spp.</b>			29-48	
	leatherweed	CRPOP	<i>Croton pottsii var. pottsii</i>	29-48	-
	globemallow	SPHAE	<i>Sphaeralcea</i>	29-48	-
	verbena	VEPO4	<i>Verbena polystachya</i>	29-48	-
12	<b>Stemless Pingue, Annual Buckwheat</b>			29-48	
	annual buckwheat	ERAN4	<i>Eriogonum annuum</i>	29-48	-
	stemless four-nerve daisy	TEACE	<i>Tetranneuris acaulis var. epunctata</i>	29-48	-
13	<b>Wild Buckwheat sp, Locoweed sp, Other per. and annl forb</b>			29-48	
	Forb, annual	2FA	<i>Forb, annual</i>	29-48	-
	Forb, perennial	2FP	<i>Forb, perennial</i>	29-48	-
	buckwheat	ERIOG	<i>Eriogonum</i>	29-48	-
<b>Shrub/Vine</b>					
14	<b>Feather Dalea, Bigelow Sagebrush, Catclaw Mimosa</b>			29-48	
	Bigelow sage	ARBI3	<i>Artemisia bigelovii</i>	29-48	-
	featherplume	DAFO	<i>Dalea formosa</i>	29-48	-
	catclaw mimosa	MIACB	<i>Mimosa aculeaticarpa var. biuncifera</i>	29-48	-
15	<b>Broom Snakeweed, Groundsel spp, Fringed Sagewort,</b>			29-48	
	Shrub, deciduous	2SD	<i>Shrub, deciduous</i>	29-48	-
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	29-48	-
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	29-48	-
	ragwort	SENEC	<i>Senecio</i>	29-48	-
	soapweed yucca	YUGL	<i>Yucca glauca</i>	29-48	-

## Animal community

Habitat for Wildlife:

This site provides habitats that support a resident animal community of antelope, fox, badger, ground squirrel, snakes and quail. As data is available, species indigenous to the site will be added to this section.

## 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

Arvana-----C

Potter-----C, D

**Recreational uses**

Recreation potential is limited. Suitability for camping, picnicking and hiking is fair, limited mainly by lack of live water and the lack of shade. Hunting is good for antelope, quail, dove and small game. The terrain typical of the "wide open spaces" of the area enhances aesthetic appeal. The natural beauty of this site is enhanced by the large variety of flowering plants that bloom from early spring to late fall with the availability of precipitation.

**Wood products**

This site produced no wood products.

**Other products**

Grazing:

All classes and kinds of livestock can graze this site during any season of the year. Approximately 90 percent of the total yield are from species that furnish forage for grazing animals. These species are a large variety of grasses and forbs, which provide good forage and nutrition for grazing animals during most of the year. Supplemental protein is needed during the winter months. Due to the potential of this site to produce forbs, it may favor some grazing by sheep and antelope. Continuous yearlong grazing by cattle or continual grazing during the period from April through October will cause the site to deteriorate and become less productive. Species such as little bluestem, sideoats grama, black grama and New Mexico feathergrass will decrease in composition of the plant community. Sideoats grama generally continues to grow but lacks vigor and height. Species most likely to increase from small amounts or trace amounts are blue grama, hairy grama, threeawn spp., tridens spp., silver bluestem and ring muhly. Blue grama declines in vigor and becomes more turflike. As the ecological condition deteriorates further, the site frequently has dense stands of broom snakeweed and lesser amounts of the stemless pingue, fringed sagewort and yucca. A system of deferred grazing, which varies the season of rest and grazing during successive years, is needed to maintain or to improve a healthy well-balanced plant community. Deferment during different seasons of the year benefits different species. Rest during the winter benefits winterfat. Also, cattle show a definite preference to black grama during the late winter and it can be over utilized. Winter rest will reduce the grazing pressure on black grama. Spring rest (April-June) will benefit cool-season grasses such as New Mexico feathergrass and early forbs. Summer rest will benefit warm-season species such as little bluestem, sideoats grama, black grama and blue grama. Fall rest will allow the warm-season plants to complete their growth cycle and mature.

**Other information**

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index-----	Ac/AUM
100 - 76-----	2.4 – 4.1
75 – 51-----	3.1 – 6.5
50 – 26-----	4.0 – 9.0
25 – 0-----	9.0+

**Type locality**

Location 1: Curry County, NM
Location 2: Harding County, NM
Location 3: Quay County, NM

**Other references**

Data collection for this site was done in conjunction with the progressive soil surveys within the Southern High Plains 77 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the

following soil surveys: Curry, Harding & Quay.

Characteristic Soils Are:

Arvana-----Potter

Sharvana

## 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:**

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

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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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:**

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