

Ecological site R035XG116NM Shallow

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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.

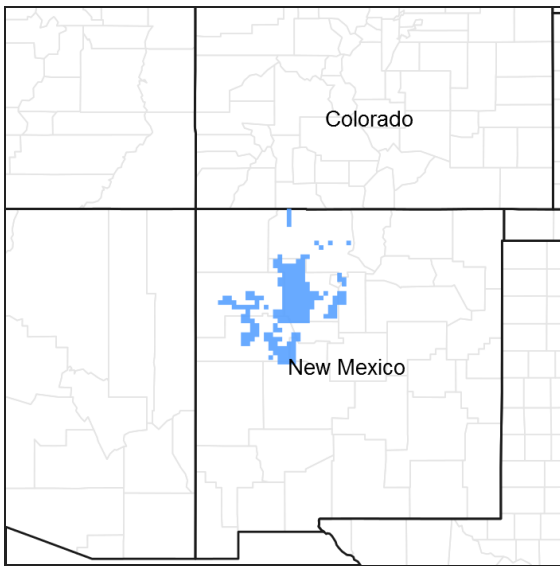


Figure 1. Mapped extent

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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Bouteloua gracilis</i> (2) <i>Hesperostipa neomexicana</i>

Physiographic features

This site occurs on gently sloping to undulating terrain. Slopes vary from 1 to 15 percent. Elevations range from 6,000 to 7,300 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Cuesta (3) Ridge
Flooding frequency	None
Ponding frequency	None
Elevation	1,829–2,225 m

Slope	1–15%
Aspect	Aspect is not a significant factor

Climatic features

Average annual precipitation varies from about 10 inches to just over 16 inches. Fluctuations ranging from about 5 inches to 25 inches are not uncommon. The overall climate is characterized by cold dry winters in which winter moisture is less than summer. As much as half or more of the annual precipitation can be expected to come during the period of July through September. Thus, fall conditions are often more favorable for good growth of cool-season perennial grasses, shrubs, and forbs than are those of spring.

The average frost-free season is about 120 days and extends from approximately mid May too early or mid September. Average annual air temperatures are 50 degrees F or lower and summer maximums rarely exceed 100 degrees F. Winter minimums typically approach or go below zero. Monthly mean temperatures exceed 70 degrees F for the period of July and August.

Rainfall patterns generally favor warm-season perennial vegetation, while the temperature regime tends to favor cool-season vegetation. This creates a somewhat complex community of plants on a given ecological site, which is quite susceptible to disturbance and is at or near its productive potential only when both the natural warm/cool-season dominants are present.

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)	148 days
Freeze-free period (average)	174 days
Precipitation total (average)	406 mm

Influencing water features

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

Soil features

Surface textures are typically medium and the soils are usually gravelly, cobbly, or stony throughout the profile. They are shallow to very shallow over an indurate layer such as caliche or unweathered limestone bedrock. Permeability is moderate to rapid, but the available waterholding capacity is usually low.

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Cobbly fine sandy loam (3) Stony clay loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Very slow to moderately rapid
Soil depth	13–51 cm
Surface fragment cover <=3"	5–60%
Surface fragment cover >3"	5–15%
Available water capacity (0-101.6cm)	7.62–15.24 cm

Calcium carbonate equivalent (0-101.6cm)	1–25%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–13
Soil reaction (1:1 water) (0-101.6cm)	6.6–9
Subsurface fragment volume <=3" (Depth not specified)	5–60%
Subsurface fragment volume >3" (Depth not specified)	5–15%

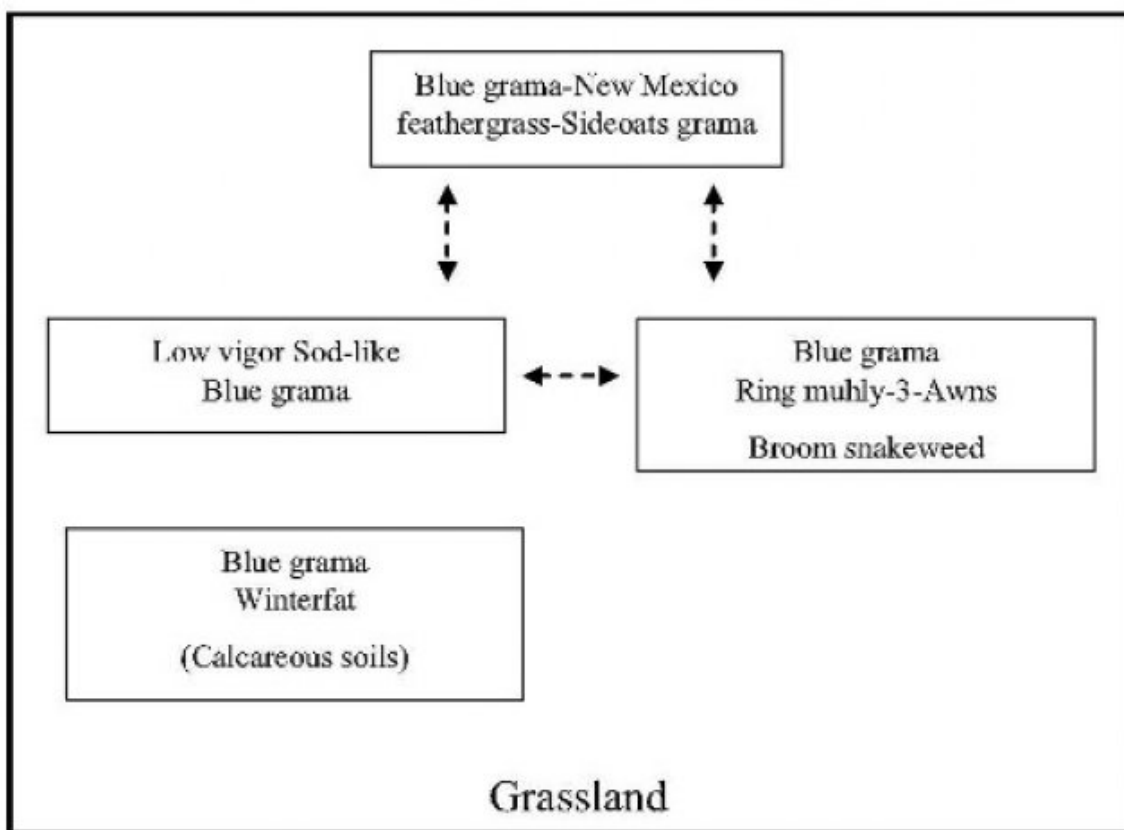
Ecological dynamics

Overview

This site occurs on benches, hills, ridges, and dipslopes of cuestras. The soils are shallow over a petrocalcic horizon (caliche), limestone, or shale. Loamy and Savannah sites often occur as areas of deeper soils interspersed or adjacent to the Shallow site. This is a grassland site characterized by a mixture of warm and cool-season grasses, scattered shrubs, and a few trees. Blue grama, New Mexico feathergrass, and sideoats grama are the dominant grasses. Winterfat and Bigelow sagebrush are characteristic shrubs. Juniper and piñon are the tree species that occur on this site. This site appears to be highly resistant to state change, as no alternate states were identified during our inventory. This may be due in part to the petrocalcic horizon¹ or bedrock that helps to keep water perched and available, favoring shallow rooted grasses.

State and transition model

MLRA 36, WP-2 Shallow



State 1

Historic Climax Plant Community

Community 1.1

Historic Climax Plant Community

State Containing Historic Climax Plant Community Grassland: Blue grama, New Mexico feathergrass, and sideoats grama are the dominant grasses. Other characteristic species include needle and thread, black grama, Indian ricegrass, western wheatgrass, little bluestem, galleta, bottlebrush squirreltail, sand dropseed, and spike muhly. Shrubs characteristic of this site are winterfat, Bigelow sagebrush, and broom snakeweed. One seed juniper is often the most common tree at lower to mid elevations, with piñon increasing on those sites that occur at higher elevations. Winterfat may naturally occur at increased densities on highly calcareous soils; the increase in winterfat may result in a blue grama/winterfat community. Changes in composition to the historic plant community may occur in response to continuous heavy grazing. This is typified by a decrease in cool-season grasses such as New Mexico feathergrass, followed by a decrease in the more palatable warm-season grasses. A less productive sod-like blue grama dominated community may result. Broom snakeweed may increase in response to overgrazing, or as a result of late fall/early spring moisture following drought.² This increase in snakeweed may result in a blue grama/snakeweed community. Diagnosis: Grasses are dominant and cover is fairly uniform with few large bare areas present. Shrubs and a few trees are present on the site with a combined canopy cover averaging seven percent. Evidence of erosion such as pedestalling of grasses, rills and gullies is infrequent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	286	548	810
Forb	24	45	66
Total	310	593	876

Table 6. Ground cover

Tree foliar cover	5-9%
Shrub/vine/liana foliar cover	5-9%
Grass/grasslike foliar cover	10-15%
Forb foliar cover	3-8%
Non-vascular plants	0%
Biological crusts	0%
Litter	10-15%
Surface fragments >0.25" and <=3"	5-60%
Surface fragments >3"	5-15%
Bedrock	0%
Water	0%
Bare ground	25-40%

Figure 5. Plant community growth curve (percent production by month). NM0307, R035XG116NM-Shallow-HCPC. Mixed warm/cool-season grassland w/shrubs and half-shrubs and forb components. Additional States: None identified at this time..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	7	10	15	25	25	8	5	0	0

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				96–129	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	96–129	–
2				65–129	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	65–129	–
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	65–129	–
3				65–129	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	65–129	–
4				7–19	
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	7–19	–
5				33–65	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	33–65	–
6				33–65	
	common wolfstail	LYPH	<i>Lycurus phleoides</i>	33–65	–
	spike muhly	MUWR	<i>Muhlenbergia wrightii</i>	33–65	–

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	spike muhly	MUWR	<i>Muhlenbergia wrightii</i>	33–65	–
7				33–65	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	33–65	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	33–65	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	33–65	–
8				7–33	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	7–33	–
9				7–33	
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	7–33	–
10				7–19	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	7–19	–
11				7–33	
	threeawn	ARIST	<i>Aristida</i>	7–33	–
	ring muhly	MUTO2	<i>Muhlenbergia torreyi</i>	7–33	–
Forb					
12				7–33	
	Forb, perennial	2FP	<i>Forb, perennial</i>	7–33	–
13				7–19	
	Forb, annual	2FA	<i>Forb, annual</i>	7–19	–
Tree					
14				7–33	
	juniper	JUNIP	<i>Juniperus</i>	7–33	–
	twoneedle pinyon	PIED	<i>Pinus edulis</i>	7–33	–
Shrub/Vine					
15				7–19	
	pale desert-thorn	LYPA	<i>Lycium pallidum</i>	7–19	–
	oak	QUERC	<i>Quercus</i>	7–19	–
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	7–19	–
16				7–33	
	Bigelow sage	ARBI3	<i>Artemisia bigelovii</i>	7–33	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	7–33	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	7–33	–

Animal community

Habitat for Wildlife:

This ecological site provides habitats which support a resident animal community that is characterized by pronghorn antelope, coyote, black-tailed jackrabbit, Merriam's kangaroo rat, white-throated woodrat, silky pocket mouse, sparrow hawk, Cassin's kingbird, chipping sparrow, plateau whiptail, short-horned lizard and prairie rattlesnake. Where pinyon pine and juniper increase under conditions of site retrogression, mule deer, gray fox, pinyon mouse, and scrub jay utilize the site. Mourning dove and black-chinned sparrow use it to nest. The chestnut-collared longspur winters here and the common raven and prairie falcon hunt over this site.

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

Churipa-----C

Lavodnas-----C

Menefee-----D

Persayo-----D

Sandoval-----D

Shadilto-----D

Winona-----D

Recreational uses

This site offers fair to good potential for hiking, horseback riding, nature observation, photography, camping, and picnicking. It offers good potential for pronghorn antelope hunting, and poor to fair opportunities for hunting mule deer.

A generally open landscape, dotted by shrubs and half-shrubs, provides natural beauty on this site.

Wood products

This site at its potential has little or no significant value for wood products.

Other products

Grazing:

This site is suitable for grazing by most kinds and classes of livestock in all seasons of the year, but is poorly suited for continuous yearlong use if the natural potential vegetation is to be maintained. Occasional spring or fall deferment is especially critical for continued production of such grasses as New Mexico feathergrass and needleandthread. Summer rest is important if the production of sideoats grama and blue grama is to be sustained. Heavy prolonged use on a continuous basis will most likely result in a rapid decrease in cool-season grasses and a more gradual but eventually just as certain decrease in sideoats grama, winterfat, little bluestem, spike muhly, and blue grama. Advanced site deterioration may be typified by an increase of such plants as broom snakeweed, ring muhly, and threeawn spp. The site is also subject to invasion by woody plants such as rabbitbrush.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity-----Index Ac/AUM

100 - 76-----3.6 – 4.7

75 – 51-----4.5 – 6.7

50 – 26-----6.5 – 11.5

25 – 0-----11.5+

Type locality

Location 1: Catron County, NM

Location 2: Socorro County, NM

Other references

Data collection for this site was done in conjunction with the progressive soil surveys within the New Mexico and Arizona Plateaus and Mesas 36 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: McKinley, Socorro, Cibola, Sandoval Catron.

1. Hennessy, J.T., R.P. Gibbens, J.M. Tromble, and M. Cardenas. 1983. Water properties of caliche. J. Range

Manage. 36: 723-726.

2. McDaniel, K. C., L. A. Torell, and J.W. Bain. 1993. Overstory-understory relationships for broom snakeweed-blue grama grasslands. *Journal of Range Management*. 46: 506-511.

3. Stubbendieck, J., S. L.Hatch, and C. H. Butterfield, 1992. *North American range plants*. 4th ed. Lincoln, NE: University of Nebraska Press. 493 p.

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:**
