USDA Natural Resources Conservation Service

Ecological site R077BY011NM
High Lime

Accessed: 05/11/2025

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.

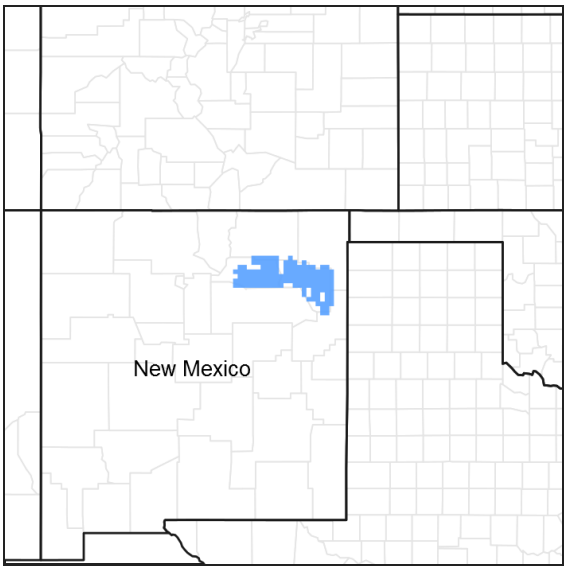

Figure 1. Mapped extent

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.

Classification relationships

Characteristic Soils Are:
Karde
Other Soils included are:
Bankard
Kim
Spurlock
Valent

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs intermittently on nearly level to sloping uplands. This site commonly occurs on the leeward side of playa lakes and may in effect be a large low dune formed by deposition of wind blown material from the lake floor. Slopes range from 0 to 9 percent. Elevation is from 4,800 to 5,800 feet above sea level. The exposure is generally

to the south and west but may vary and is not significant.

Table 2. Representative physiographic features

Landforms	(1) Alluvial flat (2) Dune
Flooding duration	Very brief (4 to 48 hours) to very long (more than 30 days)
Flooding frequency	Occasional to frequent
Elevation	4,800–5,800 ft
Slope	0–9%
Aspect	S, SW, W

Climatic features

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

Precipitation averages from about 15 to 16 inches annually with approximately 75 percent of this yearly moisture falling during the period of May through October. Most summer rainfall is associated with usually brief afternoon and evening thundershowers, which occasionally produce heavy rain over a small area, and sometimes bring a little hail. Winters are generally dry, with only one or two days a month when as much as one-tenth inch of moisture falls. However, winter average 20 inches of snow, although most snowfalls are light with an occasional storm producing up to six inches. Following these storms, snow may lie on the ground for several days and occasionally moderate to strong winds accompanying these storms result in blizzard conditions and heavy drifting. Although the precipitation patterns favor the production of warm-season plants, sufficient moisture is received in the late winter and the spring to support cool-season plants. Approximately 25 percent of the annual precipitation is received during April and May. May is generally the wettest month followed by July and then August.

Temperatures show the seasonal changes and large annual and diurnal ranges characteristic of such a climate. Summers are generally mild. The high daily temperature reading exceed 90 degrees F about one-third of the time, and readings of 100 degrees F occur about once a year. Rapid cooling after sundown results in minimum temperatures below 60 degrees F on most nights, even in midsummer. Winter shade temperatures usually rise to the mid-40’s and an average of only 15 days fail to see temperatures rise above the freezing mark most of the time from early November through March; below zero readings occur on an average of only three times a year.

The freeze-free season ranges from 168 days to 171 days between April 28th to October 16th. Both temperatures and annual precipitation favor warm-season plants. About 40 percent of the annual precipitation is received during the season where temperatures will benefit cool-season plants and only 10 percent falls during the dormant season.

While open to winter invasions of arctic air over the Great Plains, this area is far enough south and west to miss many of these outbreaks. Mountains to the north and west intercept mush of the precipitation from the Pacific northwest storms coming through this area during the winter. An average hourly wind velocity for the year is 15 miles per hour. Somewhat higher winds prevail during the spring months, but velocities exceeding 24 mile per hour are experienced only 10 percent of the usual year. Stronger winds blow chiefly from a westerly or southwesterly direction during the spring. Relative humidity is moderately low.

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)	191 days
Freeze-free period (average)	220 days
Precipitation total (average)	16 in

Influencing water features

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

Soil features

The soils of this site are deep, well drained and are calcareous on the surface and throughout their profile. The surface layer is loam, sandy loam or fine sandy loam 6 to 8 inches thick. The subsurface is clay loam or loam. The permeability is moderate to moderately rapid. The available water-holding capacity is moderate. Effective rooting depth is 60 inches with some limitations for depth below 20 inches due to dense lime. The calcium content of these soils has a direct effect on the kinds and amounts of vegetation produced.

Table 4. Representative soil features

Surface texture	(1) Ashy loam (2) Sandy loam (3) Fine sandy loam
Family particle size	(1) Clayey
Drainage class	Well drained to excessively drained
Permeability class	Moderately slow to rapid
Soil depth	60–72 in
Available water capacity (0-40in)	6–9 in
Electrical conductivity (0-40in)	0–8 mmhos/cm
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–21%
Subsurface fragment volume >3" (Depth not specified)	0–2%

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

This site is a grassland dominated by warm-season mid grasses. Cool-season grasses and warm-season short grasses make up an important portion of the plant community. Woody species and forbs occupy only a minor portion of the community. The calcium content of the soils has a direct effect on the kinds as well as the amount of vegetation produced. Other grasses that could appear on this site include: Indian ricegrass, ring muhly, mat muhly, threeawn spp., silver bluestem, cane bluestem, inland saltgrass and vine-mesquite. Other shrubs include: small soapweed yucca, fringed sagewort, and Bigelow sagewort. Other forbs include: dotted gayfeather, heathaster, and globemallow spp.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	704	1012	1320
Shrub/Vine	32	46	60
Forb	32	46	60
Total	**768**	**1104**	**1440**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0-5%
Grass/grasslike foliar cover	25-30%
Forb foliar cover	5-7%
Non-vascular plants	0%
Biological crusts	0%
Litter	20-25%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	35-40%

Figure 5. Plant community growth curve (percent production by month). NM4910, R077BY011NM High Lime Reference State. R077BY011NM High Lime Reference State Warm-season short/mid-grassland with a major component of cool-season grasses and forbs and a minor shrub component.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	5	10	10	25	30	12	5	0	0

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Blue Grama**			173–230	
	blue grama	BOGR2	*Bouteloua gracilis*	173–230	–
2	**Sideoats Grama**			173–230	
	sideoats grama	BOCU	*Bouteloua curtipendula*	173–230	–
3	**Sand dropseed**			115–173	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	115–173	–
4	**Little bluestem**			58–115	
	little bluestem	SCSC	*Schizachyrium scoparium*	58–115	–
5	**Alkali Sacaton**			58–115	
	alkali sacaton	SPAI	*Sporobolus airoides*	58–115	–
6	**Western wheatgrass**			58–115	
	western wheatgrass	PASM	*Pascopyrum smithii*	58–115	–
7	**Galleta grass**			58–115	
	James' galleta	PLJA	*Pleuraphis jamesii*	58–115	–
8	**Hairy grama**			35–58	
	hairy grama	BOHI2	*Bouteloua hirsuta*	35–58	–
9	**Bottlebrush Squirreltail**			35–58	
	squirreltail	ELEL5	*Elymus elymoides*	35–58	–
10	**NM Feathergrass**			35–58	
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	35–58	–
11	**Other grasses**			0–58	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	0–58	–
Forb					
12	**Silverleaf nightshade**			0–58	
	silverleaf nightshade	SOEL	*Solanum elaeagnifolium*	0–58	–
13	**Annual forbs**			0–58	
	Forb, annual	2FA	*Forb, annual*	0–58	–
14	**Perennial forbs**			0–58	
	Forb, perennial	2FP	*Forb, perennial*	0–58	–
Shrub/Vine					
15	**Winterfat Fourwing saltbush**			35–58	
	fourwing saltbush	ATCA2	*Atriplex canescens*	35–58	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	35–58	–

Hydrological functions

The runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups.
Soil Series----Hydrologic Group
Bankark---------A
Karde-----------B
Kim-------------B

Spurlock--------B
Valent----------A

Recreational uses

This site provides very limited recreation potential due to the windblown material, lack of live water and shade. It provides poor hiking, camping and picnicking.

Wood products

This site has not significant potential wood production.

Other products

Grazing:
This site can be grazed any season of the year by all classes of livestock. Approximately 90 percent of the total annual production is from species that furnish forage for grazing animals. There is a large variety of grasses that furnish good nutrition for livestock during most seasons of the year. Protein supplement is normally needed only during the late winter months. Continuous grazing yearlong or grazing continually during the period from April to October will cause the plant community to deteriorate. Species such as sideoats grama, blue grama, western wheatgrass and winterfat will decrease and are replaced by alkali sacaton, inland saltgrass, broom snakeweed and annual forbs. The decline in the plant community is usually accompanied by loss of plant cover causing a severe soil-blowing problem. Generally, this site is among the first to be overgrazed due to the proximity of the site to the intermittent playas where many pit tanks are constructed making water available longer. A system of deferred grazing is needed to maintain or improve a healthy well-balanced plant community. Deferment during different seasons of the year benefits different plants. Winter deferment benefits winterfat and fourwing saltbush. Spring (April – June) rest benefits forbs and cool-season grasses such as western wheatgrass, New Mexico feathergrass and bottlebrush squirreltail. Summer (July – September) rest benefits warm-season plants such as sideoats grama, blue grama, and little bluestem. Summer rest allows the cool-season species to complete their growth cycle. Fall rest allows warm-season plants to complete their growth cycle.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month
Similarity Index-----Ac/AUM
100 - 76----------2.4 – 4.0
75 – 51----------3.3 – 4.9
50 – 26----------4.2 – 6.5
25 – 0----------6.5+

Type locality

Location 1: Colfax County, NM
Location 2: Harding County, NM
Location 3: Mora County, NM
Location 4: San Miguel County, NM
Location 5: Union County, NM

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:**