USDA Natural Resources
Conservation Service

Ecological site R038XB104NM
Loamy

Accessed: 05/14/2025

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.

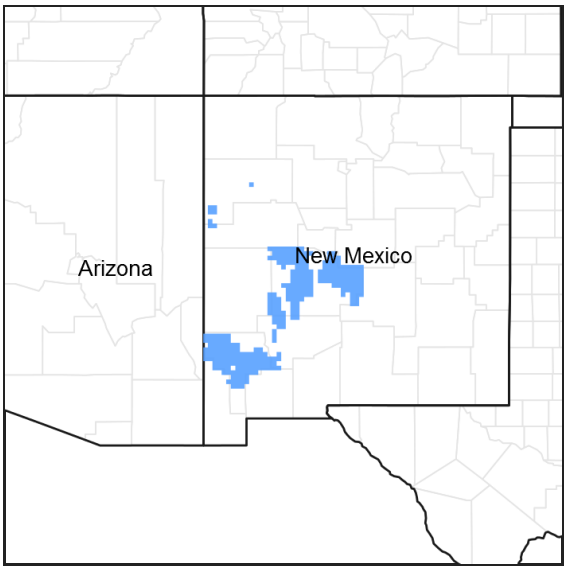


Figure 1. Mapped extent

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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on level to occasionally strongly sloping piedmont slopes or plains. Slopes range from 0 to 15 percent but average less than 10 percent. Elevations vary from just under 5,000 to about 6,800 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Fan piedmont (2) Plain
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Rare to occasional
Elevation	1,524–2,073 m

Slope	0–15%
Aspect	Aspect is not a significant factor

Climatic features

Average annual precipitation varies from about 12 inches to just over 16 inches. Substantial fluctuations from year to year are common, ranging from a low of about 6 inches to a high of over 30 inches. Approximately one-half of the annual precipitation comes in the form of rainfall during the months of July, August, and September, although wintertime precipitation in the form of snow, sleet, or rain is sometimes significant. Spring and late fall months are normally dry.

The average frost-free period ranges from about 165 to 190 days and extend from approximately the third or fourth week in April to mid October. Average annual air temperatures are about 56 degrees F. Summer maximums can exceed 100 degrees F and winter minimums on occasion go below zero. Monthly mean temperatures generally exceed 70 degrees F for the period of June through August.

Growing conditions favor warm-season perennial vegetation, although late winter and late summer precipitation is adequate to foster a significant cool-season component in the potential plant community. Occasional wet springs also create good conditions for annual forb production, but frequent winds from the west and southwest are common during this time of year and tend to deplete the soil moisture at a critical time for the growth of these plants.

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)	187 days
Freeze-free period (average)	211 days
Precipitation total (average)	406 mm

Influencing water features

Soil features

Typical soils are moderately deep to deep and well drained. The surface layer may be loams, fine sandy loams (less than 5 inches thick), and very fine sandy loams, while underlying layers may be heavy sandy loams, sandy clay loams, clay loams, silt loams, silty clay loams, or clay with thick surfaces. The soils have moderate to slow permeability and high water-holding capacities.

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Cobbly fine sandy loam (3) Very fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Very slow to moderately rapid
Soil depth	183 cm
Surface fragment cover <=3"	15–35%
Surface fragment cover >3"	15–35%

Available water capacity (0-101.6cm)	7.62–17.78 cm
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Soil reaction (1:1 water) (0-101.6cm)	6.1–9
Subsurface fragment volume <=3" (Depth not specified)	0–41%
Subsurface fragment volume >3" (Depth not specified)	0–35%

Ecological dynamics

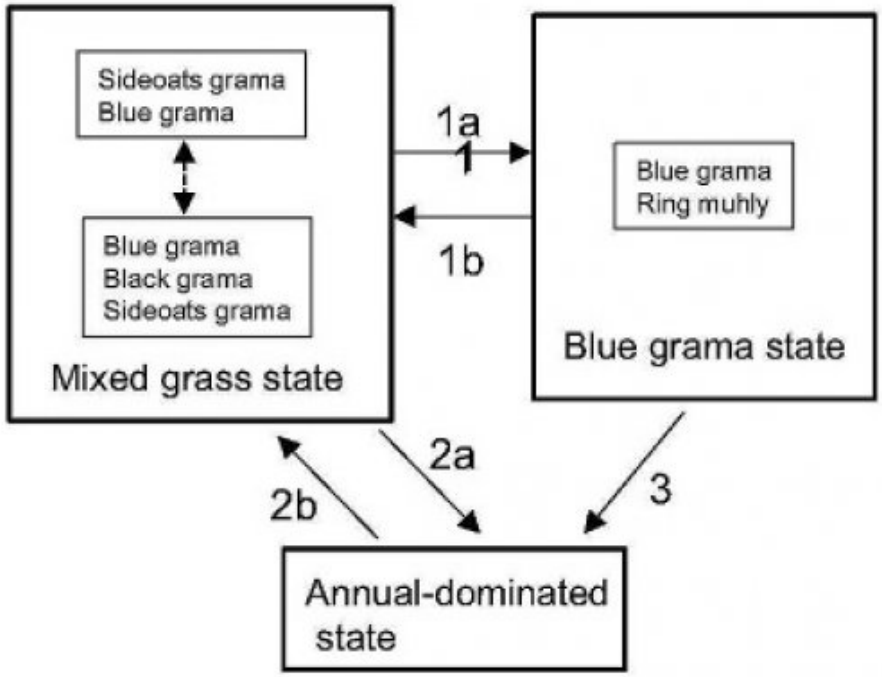
Overview

The loamy site often lies between areas of breaks or hills sites. The historic plant community type is dominated by sideoats grama (*Bouteloua curtipendula*) and blue grama (*Bouteloua gracilis*). Cool-season grasses fluctuate with spring/early summer rainfall. Heavy grazing may result in the loss of sideoats grama, perhaps accompanied by soil degradation and reduced infiltration. Blue grama and ring muhly (*Muhlenbergia torreyi*) dominate these communities. Under these conditions, runoff may increase and gullies may form that divert water from surrounding plant communities. In these circumstances, continued grazing pressure may lead to perennial grass extinction and dominance by annuals. Annual cover may be so dense that it inhibits the subsequent colonization of the site by grasses.

No systematic studies of communities, states or transitions have been performed in the loamy site.

State and transition model

State-Transition model: MLRA 36, WP-3, Fine soils group, Loamy



1a. Overgrazing, erosion, loss of soil fertility, extinction of sideoats grama
1b. Recovery of soil fertility, seeding
2a. Overgrazing, drought, gullying, erosion
2b. Gully repair, seeding
3. Gullying, heavy use of blue grama, continued erosion

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

State Containing the Historic Climax Plant Community Mixed grass: The historic community type is a lush grassland dominated by sideoats grama and blue grama and harboring a high diversity of grass species. Cane bluestem (*Bothriochloa barbinodis*) and vine mesquite (*Panicum obtusum*) may occur in patches experiencing especially high soil moisture. Yucca (*Yucca elata*) and ephedra (Ephedra spp.) may be common. Cool-season grasses, including bottlebrush squirreltail (*Elymus elymoides*) and New Mexico feathergrass (Stipa neomexicana) may increase in cover with sufficient winter-spring rainfall. Overall, ground cover of grasses is very high. Drought may reduce the cover of sideoats grama, cane bluestem, and vine mesquite and favor the colonization and spread of black grama (*Bouteloua eriopoda*). With heavy grazing, sideoats grama and black grama decline rapidly leaving blue grama and other species, especially ring muhly, as dominants. Diagnosis: Sideoats grama is dominant in most patches and perennial grass and litter cover is continuous. Species richness of perennial grasses across an acre-sized area is often high (8 or more). Evidence of erosion is rare. Transition to mixed grass state (1b): Recovery would require the repair of gullies and return of run-on water if gullies are present. Seeding of sideoats grama during periods of average to above average rainfall alongside deferred grazing might be used to catalyze recovery of the sideoats-blue grama community. Transition to mixed grass state (2b): As above, recovery would require the repair of gullies and return of run-on water. Seeding of perennial species during periods of average to above average rainfall alongside deferred grazing might be used to catalyze the eventual recovery of the sideoats-blue grama community. It may be necessary to disrupt annual cover to accomplish this.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	405	679	953
Forb	381	64	90
Total	**786**	**743**	**1043**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	4%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	20%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	49%

Figure 5. Plant community growth curve (percent production by month). NM0604, R038XB104NM Loamy HCPC. R038XB104NM Loamy HCPC Mixed short/mid-grassland..

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

State 2
Transition to blue grama state

Community 2.1
Transition to blue grama state

Additional States: Transition to blue grama state (1a): Continuous heavy grazing in combination with drought may locally extirpate sideoats grama and black grama and result in soil degradation and reduced infiltration due to erosion. Key indicators of approach to transition: Heavy utilization of sideoats grama, increases in bare ground, decreases in litter cover and grass cover. Blue grama: Grass cover is highly reduced compared with the mixed grassland state. The dominant plants are blue grama and ring muhly, and threeawns (Aristida spp.) and snakeweed (Gutierezia spp.) may be common. Sideoats grama, cane bluestem, and vine mesquite are usually absent or rare. This is due, in part, to reduced infiltration of water and/or to diversion of run-on water by gullies. Water infiltration may be reduced in bare patches by the loss of organic matter to erosion and reduced soil aggregate stability. Species richness of perennial grasses is low. Bare ground is high and erosion between plants is evident. In some cases, junipers (*Juniperus monosperma*) and shrubs may colonize within this state. Diagnosis: Blue grama is dominant, bare ground is interconnected, water flow patterns and rills may be evident. Gullies may exist in the area.

State 3
Transition to annual-dominated state

Community 3.1

Transition to annual-dominated state

Transition to annual-dominated state (3): Continued erosion and deepening of gullies alongside heavy use and mortality of remaining perennial grasses may result in dominance by annuals. Annual-dominated: Perennial grasses are rare or absent, and a seasonal cover of annuals is the dominant vegetation. Infiltration rates may be very low. Annual cover may be dense enough to preclude establishment of perennial grasses during favorable periods due to shading and competition for soil resources. Deep gullies are often associated with this state. Diagnosis: Perennial grasses are rare, annual cover or bare ground cover is continuous. Gullies are usually present.

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				200–240	
	blue grama	BOGR2	*Bouteloua gracilis*	200–240	–
2				40–80	
	black grama	BOER4	*Bouteloua eriopoda*	40–80	–
3				80–120	
	sideoats grama	BOCU	*Bouteloua curtipendula*	80–120	–
4				80–24	
	Hall's panicgrass	PAHA	*Panicum hallii*	8–24	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	8–24	–
5				40–80	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	40–80	–
	Arizona cottontop	DICA8	*Digitaria californica*	40–80	–
	vine mesquite	PAOB	*Panicum obtusum*	40–80	–
6				40–120	
	squirreltail	ELEL5	*Elymus elymoides*	40–120	–
7				8–40	
	bush muhly	MUPO2	*Muhlenbergia porteri*	8–40	–
8				24–64	
	James' galleta	PLJA	*Pleuraphis jamesii*	24–64	–
	tobosagrass	PLMU3	*Pleuraphis mutica*	24–64	–
9				40–80	
	threeawn	ARIST	*Aristida*	40–80	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	40–80	–
	sand muhly	MUAR2	*Muhlenbergia arenicola*	40–80	–
	ring muhly	MUTO2	*Muhlenbergia torreyi*	40–80	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	40–80	–
10				8–24	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	8–24	–
Forb					
11				8–40	
	desert marigold	BAMU	*Baileya multiradiata*	8–40	–
	bastardsage	ERWR	*Eriogonum wrightii*	8–40	–

	whitestem paperflower	PSCO2	*Psilostrophe cooperi*	8–40	–
	threadleaf ragwort	SEFLF	*Senecio flaccidus var. flaccidus*	8–40	–
	globemallow	SPHAE	*Sphaeralcea*	8–40	–
12				24–64	
Tree					
13				8–40	
	soaptree yucca	YUEL	*Yucca elata*	8–40	–
Shrub/Vine					
14				8–40	
	longleaf jointfir	EPTR	*Ephedra trifurca*	8–40	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	8–40	–
	pale desert-thorn	LYPA	*Lycium pallidum*	8–40	–
15				8–24	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	8–24	–
	pricklypear	OPUNT	*Opuntia*	8–24	–

Animal community

Habitat for Wildlife:
This site provides habitat which can support a resident animal community characterized by pronghorn antelope, black-tailed prairie dog, Botta's pocket gopher, bannertail kangaroo rat, kit fox, badger, burrowing owl, scaled quail, meadowlark, plains and western spadefoot toad, little striped whiptail, and prairie rattlesnake.

Where large soaptree yucca and woody shrubs are present, Scott's oriole, mockingbird, and mourning dove nest.

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
Alicia----------B
Clovis----------B
Dagflat----------B
Denver----------D
Glenberg----------B
Judd----------C
La Fonda----------B
Lonti----------C
Majada Variant----------B
Manzano----------B
Millett----------B
Paymaster----------B
Penistaja----------B
Sampson----------B
San Mateo----------B
San Loren----------B
Tesajo----------B

Recreational uses

This site offers recreation potential for horseback riding, nature observation, photography, and hunting for pronghorn antelope, scaled quail, and mourning dove.

During certain seasons when soil moisture is favorable, the site displays a colorful array of wildflowers.

Wood products

This site has no significant value for wood products.

Other products

Grazing:
This site is suitable for grazing in all seasons of the year, although most of the forage is produced in the summer months. It is adapted for cattle, sheep, goat, and horses, generally without regard to class of livestock. As retrogression occurs, such plants as threeawns, fluffgrass, tobosa, and broom snakeweed more and more characterize the plant community. It is also subject to invasion by mesquite or juniper and eventually becomes characterized by large amounts of bare ground. It does not recover rapidly at this stage through improved grazing management alone.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index----------Ac/AUM
100 - 76----------3.2 – 4.5
75 – 51----------4.3 – 6.6
50 – 26----------6.4 – 11.0
25 – 0----------11.0+

Type locality

Location 1: Grant County, NM
Location 2: Catron County, NM
Location 3: Hidalgo County, NM
Location 4: Sierra County, NM
Location 5: 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: Socorro, Sierra, Grant, Catron.

Characteristic Soils Are:
Dagflat, Lonti, Manzano

Other Soils included are:
Alicia, Cerritos, Clovis, Denver, Glenberg Harvey, Judd, La Fonda, Majada Variant, Millett Paymaster, San Loren, San Mateo, Tesajo

Information sources and theoretical background:
Communities, states, and transitions are based upon information in the ecological site description and observations by Gene Adkins, Gary Garrison, David Trujillo, NRCS, and Brandon Bestelmeyer, USDA-ARS Jornada Experimental Range.

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:**