USDA Natural Resources
Conservation Service

Ecological site R070BY060NM
Breaks south exposure

Last updated: 9/12/2023
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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.

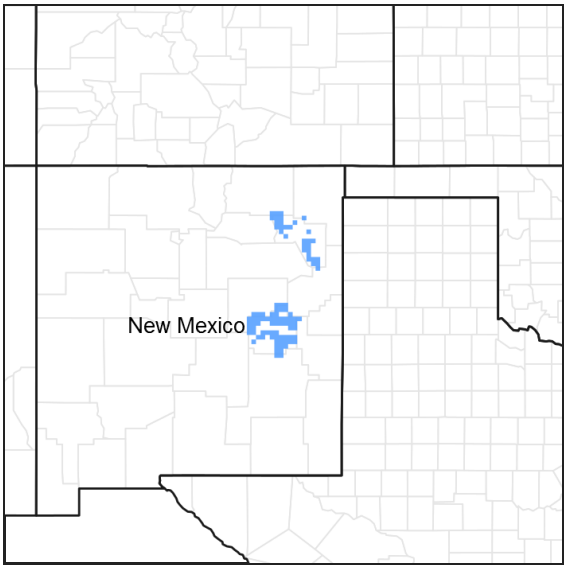


Figure 1. Mapped extent

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.

Ecological site concept

This site is on nearly level to very steep landforms and occurs maily on convex, low ridgetops, escarpments, and side slopes of erosional plains. Slope ranges from 0 to 80 percent.
Soils are shallow and very shallow over caliche, siltstone, or sandstone. Surface textures are stony loam, gravelly loam, gravelly fine sandy loam, sandy loam, very gravelly loam, or fine sandy loam.
This ecological site is associated with the Red Shale, Sandstone Savannah, and Shallow Sandstone sites.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Rhus trilobata* (2) *Quercus*
Herbaceous	(1) *Bouteloua eriopoda* (2) *Bouteloua curtipendula*

Physiographic features

Soils of this ecological site formed in residuum and colluvium derived from shale, siltstone, or sandstone of the Triassic Santa Rosa and Chinle Formations, and are interrupted by many outcroppings of sandstone. Landforms

include low ridgetops, escarpments, and sideslopes of erosional plains. Slope ranges from 0 to 80 percent. Mean annual precipitation is about 14 inches and mean annual temperature is about 59 degrees F. Elevation ranges from 4,300 to 5,300 feet.

This site is south- and west-facing. As slope and relief decrease, aspect-driven differences in vegetation diminish.

Table 2. Representative physiographic features

Landforms	(1) Scarp slope (2) Cuesta (3) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	3,800–5,300 ft
Slope	20–80%
Aspect	W, S

Climatic features

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

Annual average precipitation ranges from 11 to 16 inches. Roughly 78 percent of the moisture falls during the 6-month period of 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. In the winter, there is normally only one day a month when as much as one-tenth inch of moisture falls, usually in the form of snow. Snow seldom lies on the ground for more than a few days.

Temperatures are characterized by a distinct seasonal change and large annual and diurnal temperature ranges. Summers are moderately warm. Maximum temperature average above 90 degrees F from July to August, and an average summer includes about 80 days with high readings exceeding 90 degrees F and 10 days with readings above 100 degrees F. Temperatures usually fall rapidly after sundown and lows average 60 degrees F on most summer nights. Winters are mild, sunny, and dry. Daytime shade temperatures in midwinter usually rise to the 50’s. However, freezing temperatures normally occur at night from mid-November to mid-March.

The freeze-free season ranges from 196 to 218 days. Dates of the last freeze range from April 11th to April 17th and the first freeze ranges from October 20th to October 25th.

Both temperature and rainfall distribution favor warm-season, perennial plant communities in the area. However, sufficient late winter and early spring moisture allows cool-season species to occupy a minor component within the plant community.

Climate data was obtained from http://www.wrcc.dri.edu/summary/climsmnm.html web site. Data were interpreted utilizing NM Climate Summarizer spreadsheet.

Table 3. Representative climatic features

Frost-free period (average)	192 days
Freeze-free period (average)	218 days
Precipitation total (average)	16 in

Influencing water features

This site is not influenced by water from wetlands or streams.

Soil features

Soils are shallow and very shallow over caliche, siltstone, or sandstone. Surface textures are stony loam, gravelly loam, gravelly fine sandy loam, sandy loam, very gravelly loam, or fine sandy loam. Subsoil is stony loam, gravelly loam, gravelly fine sandy loam, sandy loam, very gravelly loam, or fine sandy loam. Strongly cemented calcareous sandstone or siltstone underlies the soil material at a depth of 8 to 20 inches. Available water-holding capacity is low. Effective rooting depth is controlled by bedrock contact. Effective moisture for plant growth is reduced by the southerly exposure and drying caused by prevailing southwesterly winds.

Minimum and maximum values listed below represent the characteristic soils for this site.

Characteristic Soils:
Lacoca
Latom
Orthents

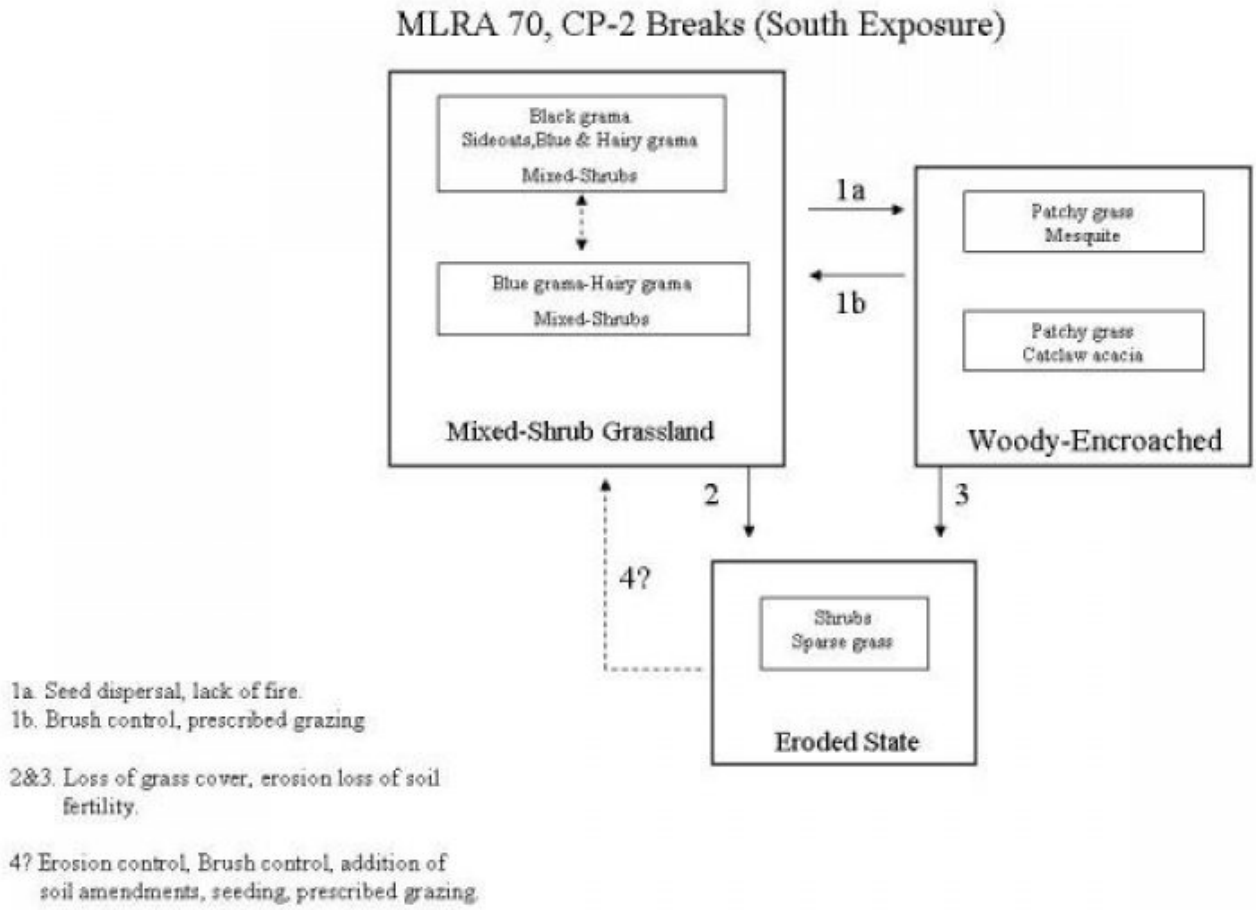
Table 4. Representative soil features

Surface texture	(1) Gravelly fine sandy loam (2) Stony loam (3) Gravelly loam
Family particle size	(1) Loamy
Drainage class	Well drained to moderately well drained
Permeability class	Moderately slow to moderate
Soil depth	4–25 in
Surface fragment cover <=3"	10–25%
Surface fragment cover >3"	1–3%
Available water capacity (0-40in)	1–3 in
Calcium carbonate equivalent (0-40in)	1–15%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–1
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	10–35%
Subsurface fragment volume >3" (Depth not specified)	1–3%

Ecological dynamics

The plant communities on this ecological site are dominated by warm-season grasses. A variety of forbs, shrubs, and an occasional tree are also present. Black grama is the dominant grass with sideoats grama, blue grama, and hairy grama occurring as sub-dominants. Seed dispersal by livestock and wildlife, decreased fire frequency, and resource competition may facilitate an increase in mesquite and catclaw acacia.
Steep slopes and shallow soils make this site susceptible to accelerated erosion. Continuous heavy grazing can cause a loss of grass cover and accelerate erosion, reducing the capacity of the site to sustain grasses.

State and transition model



State 1
Reference State

This state represents the most ecologically stable conditions in terms of resistance to erosion. Moreover, this state has the highest potential for productivity and plant diversity.

Community 1.1
Reference Plant Community

This phase is dominated by black grama, sideoats grama, blue grama, hairy grama, and mixed shrubs.

Figure 4. Plant community growth curve (percent production by month). NM4060, R070BY060NM Breaks South Exposure Reference State. R070BY060NM Breaks South Exposure Reference State.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	7	10	15	25	25	12	1	0	0

Additional community tables

Animal community

Habitat for Wildlife: This ecological site provides habitat which supports a resident animal community that is characterized by ringtail cat, desert cottontail, southern plains woodrat, rock squirrel, great horned owl, white-throated raven, rock wren, fence lizard, and collared lizard. There is seasonal use by mule deer. Many species of shrub-nesting birds utilize this site for breeding.

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
Lacoca ----------D
Latom ----------D
Orthents D

Recreational uses

This site has fair to good recreation potential. Hiking, picnicking, and camping is fair to good, limited by lack of live water. Screening is fair. Hunting for deer and rabbits is fair to good. Hunting for upland game birds is poor to fair. The aesthetic appeal is enhanced by the break in the physiographic features from open flat grasslands. The natural beauty is also enhanced by the large variety of plants, many of which bloom from early spring to late fall.

Wood products

Limited firewood can be furnished by juniper.

Other products

Grazing: This ecological site furnishes a large variety of grasses, forbs and woody species, which provide a good feed and nutrition for domestic livestock and browsing wildlife, and can be grazed during any season of the year. However, it has limited grazing potential due to the steep slopes. Distribution of domestic livestock is the main problem. All ages and classes of livestock tend to graze the flatter slopes and avoid. However, younger age classes in general and goats in particular are best-equipped to utilize the steeper terrain. Approximately 70 percent of the total annual yield are from species that furnish forage for grazing animals. Continuous yearlong grazing will cause the plant community to deteriorate to one dominated by plants of low forage value such as threeawn spp., broom snakeweed, and forbs. Mesquite will invade this site under heavy grazing pressure. A system of deferred grazing, which varies the season of grazing and rest in successive years, is needed to maintain or to improve the plant community. Different seasons of rest benefit different species. Fall rest allows most warm-season species to mature. Winter rest will benefit species such as oak and winterfat. Since cattle show a definite preference for black grama during the late winter, rest during this period will reduce the grazing pressure on this species. Spring rest (April-June) will benefit cool-season species such as New Mexico feathergrass and early forbs. Summer rest will benefit sideoats grama, black grama, and little bluestem.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index Ac/AUM
100 - 76 4.1 – 7.0
75 – 51 5.3 – 11.0
50 – 26 6.9 – 18.0
25 – 0 18.0+

Inventory data references

Data collection for this ecological site was performed in conjunction with the progressive soil surveys within the Pecos-Canadian Plains and Valleys, Major Land Resource Area 70 of New Mexico. This site has been mapped and correlated with soils in the following soil counties: San Miguel, Quay, Guadalupe, De Baca, and Chaves.

Other references

References.

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Contributors

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Approval

Kendra Moseley, 9/12/2023

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	05/11/2025
Approved by	Kendra Moseley
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:

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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:**
