USDA Natural Resources Conservation Service

Ecological site R038XB105NM
Breaks

Accessed: 05/13/2025

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.

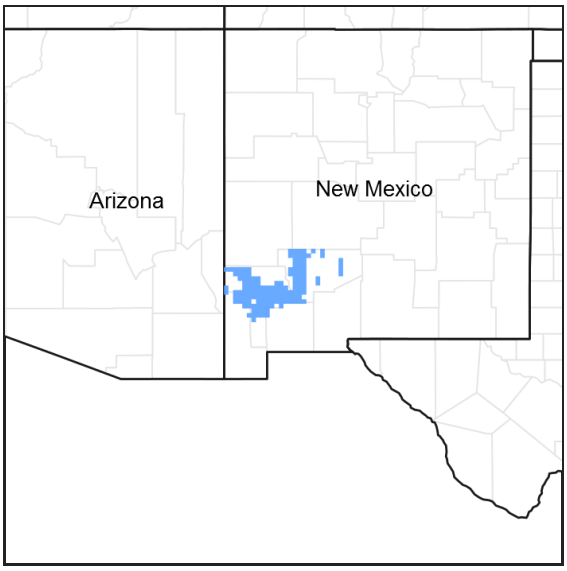


Figure 1. Mapped extent

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 rough broken topography and is characterized by long ridges forming a break that is perpendicular to drainageways. Slopes vary considerably within a 15 to 70 percent range, although they average 35 percent or less. It has various degrees and directions of slope. Small amounts of badlands or rock outcrops may occur. Elevations range from just under 5,000 feet to about 7,000 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Scarp slope
Elevation	1,524–2,134 m
Slope	15–70%
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 extends 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 the year and tend to deplete 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

Soils are deep to moderately deep and have surfaces and subsoils that are gravelly, cobbly, or stony fine sandy loams or clay loams. They are subject to severe water erosion when cover is inadequate. Plant, soil, and moisture relationships are generally good.

Table 4. Representative soil features

Surface texture	(1) Gravelly sandy clay loam (2) Cobbly clay loam (3) Stony
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Very slow to moderately rapid
Soil depth	15–183 cm
Surface fragment cover <=3"	15–35%
Surface fragment cover >3"	15–35%
Available water capacity (0-101.6cm)	2.54–15.24 cm

Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	4–57%
Subsurface fragment volume >3" (Depth not specified)	1–3%

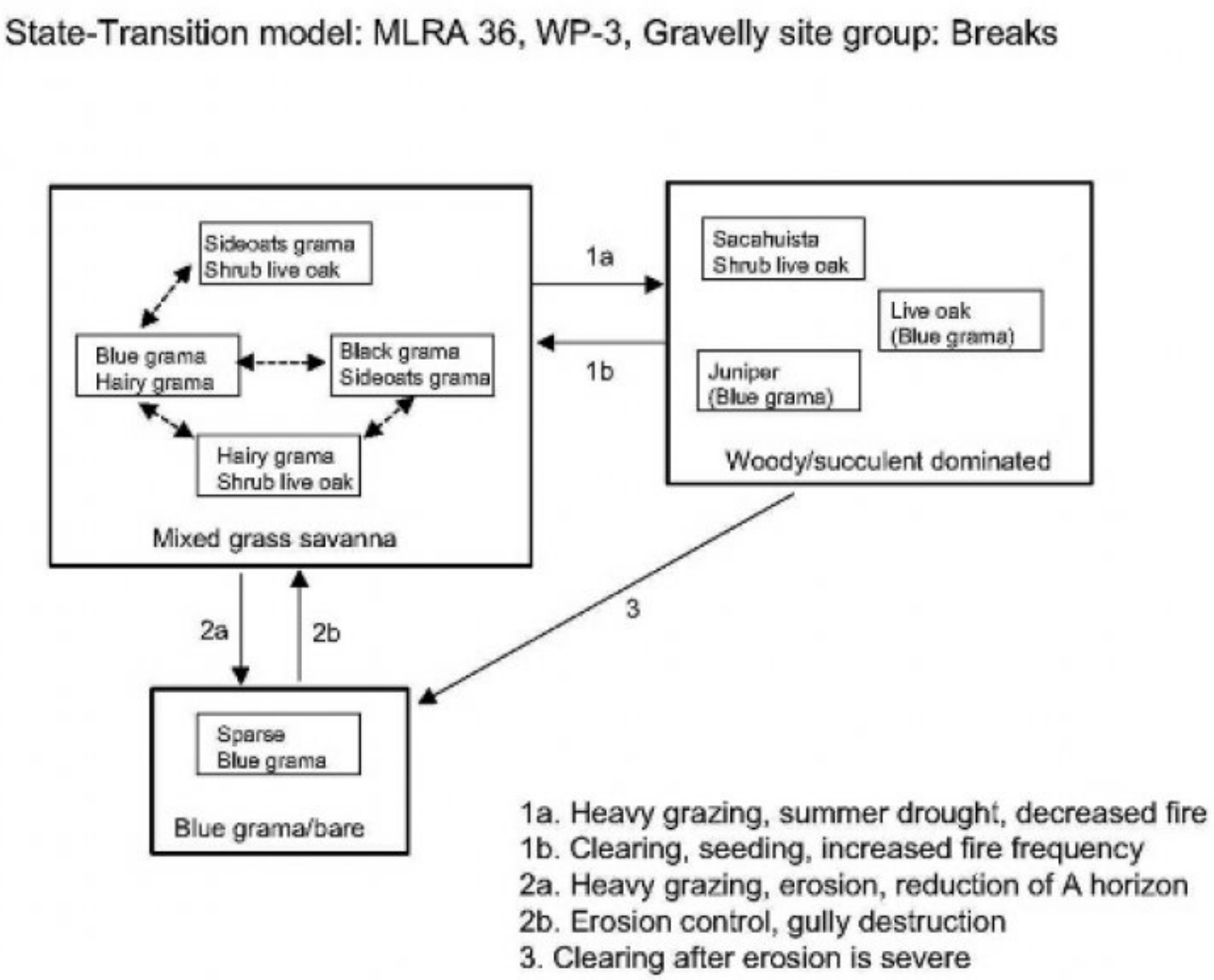
Ecological dynamics

Overview
The breaks site intergrades with hills sites and often contain loamy sites occurring as narrow to broad drainageways. The historic plant communities of the breaks site are dominated by black grama (*Bouteloua eriopoda*)and sideoats grama (*Bouteloua curtipendula*) and/or blue grama (*Bouteloua gracilis*) among others, depending on soil types and aspect. Under heavy grazing pressure, especially on steeper slopes and on soils with strong argillic (clay-rich) horizons, erosion may lead to a persistent loss of vegetation. A decline in fire frequencies, or perhaps regional increases in the relative amount of winter rainfall or grazing, may lead to significant increases in the abundance of woody plants and succulents including sacahuista (*Nolina microcarpa*), shrub liveoak (Quercus spp.), and one-seed juniper (*Juniperus monosperma*). The established woody plants may compete with grasses and lead to persistent reductions in grass abundance.

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

State and transition model

Plant Communities and Transitional Pathways (diagram)



State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

State Containint the Historic Climax Plant Community: Mixed-grass savanna: The expression of the community depends upon aspect and soils. On south-facing slopes, black grama tends to dominate and there may be some sideoats grama among other grasses. On north-facing slopes, sideoats grama dominates, with blue grama and hairy grama (*Bouteloua hirsuta*) as subordinates; black grama occurs in smaller amounts. In some cases (especially west of Silver City), sacahuista (*Nolina microcarpa*) may be dense enough to be considered a secondary dominant. Live oak, sacahuista, and juniper exist in low densities giving the site a savanna aspect. Grazing and drought-induced mortality may lead to reductions in black and sideoats grama and dominance by hairy grama, blue grama, or annuals. Diagnosis: Sacahuista, oak and juniper are present and scattered, most of the ground surface is grassy, with few large bare areas. Transition to mixed grass savanna state (2b): The placement of structures (e.g. terraces) to retard erosion and that accumulate soil, in addition to the destruction of gullies, may be used to initiate the eventual recovery of perennial grass dominance. Information sources and theoretical background: Communities, states, and transitions are based upon information in the ecological site description and observations by Gene Adkins, NRCS and Brandon Bestelmeyer, USDA-ARS Jornada Experimental Range.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	328	646	962
Forb	34	66	99
Total	**362**	**712**	**1061**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	12%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	17%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	16%

Figure 5. Plant community growth curve (percent production by month). NM0605, R038XB105NM Breaks HCPC. R038XB105NM Breaks HCPC Mixed grassland/shrubland.

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 woody/succulent-dominated state

Community 2.1
Transition to woody/succulent-dominated state

Additional States: Transition to woody/succulent-dominated state (1a): It is unclear why succulents or trees increase in abundance, although it is likely that the subsequent decline in grasses is due to competition for water and nutrients. The formation of bare ground patches due to grazing, decreases in fire frequency, and increases in winter precipitation, either independently or in concert, may be responsible for the transition. Key indicators of approach to transition: Increases in bare ground, decreases in litter cover and grass cover, increased frequency of oak seedlings and small sacahuista (threshold may have been crossed), decreased fire frequency. Transition to woody/succulent-dominated state (1b): Thinning of woody or succulent species may release grasses from competitive suppression and grasses may colonize patches where trees or sacahuista were present. If erosion in interspaces has not been severe, recolonization may take place there over several years. Woody/succulent-dominated: Grass cover is often highly reduced and shrubs, trees, or succulents become dominant. Bare ground cover is great, and scattered, small blue grama or hairy grama plants represent the dominant grass cover. West of Silver City, sacahuista tends to dominate in this state, and liveoak may or may not be a secondary dominant. In other cases, juniper or oak may dominate. Diagnosis: Oak, sacahuista, and/or juniper are the dominant perennial species and the bare ground areas between them are interconnected. Grass clumps are small and scattered. Evidence of erosion (rills, water flow patterns, pedestalling) is common.

State 3

Transition to blue grama/bare state

Community 3.1
Transition to blue grama/bare state

Transition to blue grama/bare state (2a): Heavy grazing, especially in drought conditions on steeper slopes and on soils with shallow, strong argillic horizons (e.g. Lonti gravelly loam) may result in grass loss and subsequent erosion of the organic matter-rich A horizon. Key indicators of approach to transition: Increases in bare ground, decreases in litter cover and grass cover, surface soil loss, water flow patterns, rills, pedestalling of plants and stones. Transition to blue grama/bare state (3): Tree and succulent removal, especially on slopes, may accelerate erosion if grasses do not respond to the treatment and the soil is exposed to raindrop impact and erosion. Blue grama/bare: This state is characterized by extreme erosion and tends to occur on steeper slopes. Bare ground cover is extreme, gullies may be present, and few small perennial plants, usually blue grama, are present. Trees and succulents are not especially abundant. Diagnosis: Bare ground cover is interconnected, and trees and succulents are not especially abundant. Evidence of erosion is common, the mollic A horizon is very shallow (a few cm) or missing. Transition to blue grama/bare state (3): Tree and succulent removal, especially on slopes, may accelerate erosion if grasses do not respond to the treatment and the soil is exposed to raindrop impact and erosion.

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				207–248	
	black grama	BOER4	*Bouteloua eriopoda*	207–248	–
2				83–124	
	sideoats grama	BOCU	*Bouteloua curtipendula*	83–124	–
3				83–124	
	blue grama	BOGR2	*Bouteloua gracilis*	83–124	–
4				41–124	
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	41–124	–
5				8–41	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	8–41	–
	vine mesquite	PAOB	*Panicum obtusum*	8–41	–
	little bluestem	SCSC	*Schizachyrium scoparium*	8–41	–
6				8–41	
	hairy grama	BOHI2	*Bouteloua hirsuta*	8–41	–
	Hall's panicgrass	PAHA	*Panicum hallii*	8–41	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	8–41	–
7				8–41	
	threeawn	ARIST	*Aristida*	8–41	–
8				8–41	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	8–41	–
Forb					
9				8–41	
	buckwheat	ERIOG	*Eriogonum*	8–41	–
10				8–25	
	Forb, annual	2FA	*Forb, annual*	8–25	–

	Forb, annual	2FA	*Forb, annual*	8–25	–
11				8–41	
	Forb, perennial	2FP	*Forb, perennial*	8–41	–
	Forb, perennial	2FP	*Forb, perennial*	8–41	–
Shrub/Vine					
12				83–124	
	sacahuista	NOMI	*Nolina microcarpa*	83–124	–
	oak	QUERC	*Quercus*	83–124	–
	sacahuista	NOMI	*Nolina microcarpa*	83–124	–
	oak	QUERC	*Quercus*	83–124	–
13				0–25	
	yerba de pasmo	BAPT	*Baccharis pteronioides*	0–25	–
	Fendler's ceanothus	CEFE	*Ceanothus fendleri*	0–25	–
	hairy mountain mahogany	CEMOP	*Cercocarpus montanus var. paucidentatus*	0–25	–
	featherplume	DAFO	*Dalea formosa*	0–25	–
	Apache plume	FAPA	*Fallugia paradoxa*	0–25	–
14				8–25	
	Shrub, deciduous	2SD	*Shrub, deciduous*	8–25	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	8–25	–
	pale desert-thorn	LYPA	*Lycium pallidum*	8–25	–
	pricklypear	OPUNT	*Opuntia*	8–25	–
	yucca	YUCCA	*Yucca*	8–25	–
Tree					
15				8–25	
	oneseed juniper	JUMO	*Juniperus monosperma*	8–25	–

Animal community

Habitat for Wildlife:
This ecological site provides habitat which can support a resident animal community characterized by mule deer, desert cottontail, Merriam’s kangaroo rat, brush mouse, white-throated woodrat, gray fox, hognose skunk, Gambel’s quail, roadrunner, scrub jay, Abert’s towhee, alligator lizard, black-tailed rattlesnake, and Gila monster.

Where closely associated with riparian habitats of river valleys, this site provides hunting and foraging areas for vermilion flycatcher, Bullock’s oriole, Lucy’s warbler, summer tanager, cardinal, white-winged dove, blue grosbeak phainopepla, painted redstart, turkey vulture, and Swainson’s hawk. The prairie falcon and golden eagle nest on cliffs and ledges.

Several species of riparian habitat dependent birds classified as endangered in New Mexico utilize this site for hunting and foraging where it is associated with river valleys.

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

Aridic Argiustolls----------C
Boysag----------D
Golddust----------C
Guy----------B
Ildefonso----------B
Jonale----------B
Lonti----------D
Muzzler----------D
Orthents----------B
Orthids----------B
Pena----------B
Plack----------D
Ustorthents----------B

Recreational uses

This site offers recreation potential for hiking, horseback riding, picnicking, nature observation, photography, and hunting for deer and quail. Where associated with riparian habitats of river valleys, bird watching is a major recreational activity.

The site displays a colorful array of wildflowers during certain seasons and when favorable soil/moisture conditions exist.

Wood products

This site has a very limited potential for firewood and fence postproduction where junipers are present and where steepness of slope does not make harvesting prohibitive.

Other products

Grazing:
This site is suitable for grazing in all seasons of the year. Cattle, sheep, goats, and horses can graze this site; class of livestock used is influenced by terrain. Although most of the forage is produced in the summer months, cool-season grasses such as New Mexico feathergrass and various browse plants provide green forage at other times as well. As retrogression occurs under continuous yearlong or prolonged heavy grazing or browsing, these plants are usually first to decline. Severe deterioration in the plant community can result in heavy stands of juniper, oak, or sacahuista, and the site is slow to recover through improved grazing management alone. It is generally not conducive to mechanical brush control or seeding, but grazing by more than one species of livestock (such as goats and cattle or sheep and cattle) is a means of maintaining a healthy balance of woody and herbaceous plants. It is highly erodible once vegetative cover is substantially reduced and is difficult to protect structurally.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month
Similarity Index----------Ac/AUM
100 - 76----------3.5 – 4.8
75 – 51----------4.5 – 7.0
50 – 26----------6.7 – 12.0
25 – 0----------12.0+

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:
Boysag, Guy

Other Soils included are:
Aridic Argiustolls, Chimayo, Ildefonso, Golddust, Jonale, Lonti, Muzzler, Orthents, Orthids, Pena, Plack, Plack Variant, Ustorthents, Ustorthents Dissected

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:

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17. **Perennial plant reproductive capability:**
