

Ecological site R035XG114NM Gravelly

Accessed: 05/05/2024

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.

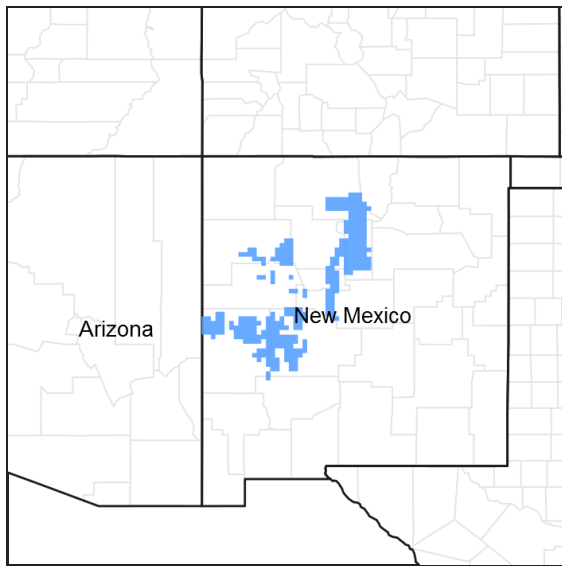


Figure 1. Mapped extent

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>Bouteloua curtipendula</i>

Physiographic features

The topography of this site ranges from gently to strongly sloping and may occur as low rolling hills and ridges dissected by natural arroyos or in combination with rock outcrop and badlands which are on very steep slopes. Average slopes are less than 35 percent, and aspect is variable. Elevation range from about 6,000 to 7,300 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Fan remnant (3) Stream terrace
Flooding frequency	None

Ponding frequency	None
Elevation	1,829–2,225 m
Slope	0–35%
Water table depth	183 cm
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 to 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 any given range 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

These soils are moderately deep to very deep. The surface and underlying layers are either gravelly or very gravelly loams, sandy loams, and fine sandy loams. The soils are well drained and moderately to rapidly permeable. The available water-holding capacity is moderate to low. Erosion is normally none to slight unless natural plant cover is seriously reduced.

Table 4. Representative soil features

Surface texture	(1) Gravelly sandy loam (2) Stony loam (3) Cobbly loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to rapid

Soil depth	51–203 cm
Surface fragment cover <=3"	15–60%
Surface fragment cover >3"	5–15%
Available water capacity (0-101.6cm)	7.62–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	5–20%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	6.6–9
Subsurface fragment volume <=3" (Depth not specified)	25–60%
Subsurface fragment volume >3" (Depth not specified)	10–20%

Ecological dynamics

Overview

This site occurs as gravelly stream or fan terraces or as low rolling gravelly hills and ridges dissected by natural drainages. It often occurs adjacent to Loamy sites or is interspersed with inclusions of loamy soils. The historic plant community of the Gravelly site is grass dominated and supports a mixture of warm and cool-season grasses, widely spaced shrubs/trees and a minor component of forbs. Blue grama is the dominant grass species. Winterfat, yucca, broom snakeweed, and rabbitbrush, are woody species typical of the site. The increase of rabbitbrush in response to fire, overgrazing, and decreased resource competition are factors that may facilitate the transition to the Shrub-Encroached state.

State and transition model

MLRA 36, WP-2 Gravelly

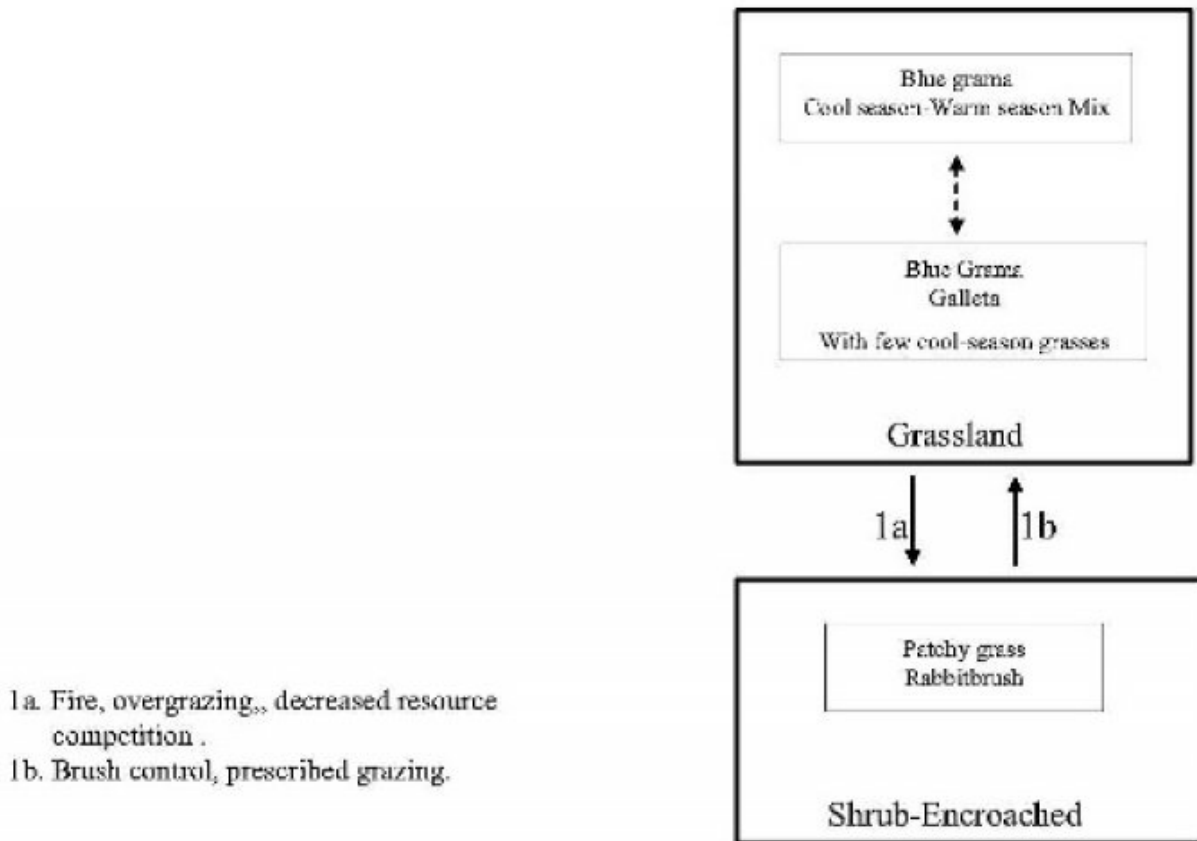


Figure 4. WP-2 36B State and Transition Gravelly Site

State 1 Historic Climax Plant Community

Community 1.1 Historic Climax Plant Community

State Containing Historic Climax Plant Community Grassland: The historic plant community supports a mixture of warm and cool-season grasses, including blue grama, black grama, little bluestem, New Mexico feathergrass, western wheatgrass, bottlebrush squirreltail, Indian ricegrass, sideoats grama, and spike muhly. Although shrubs are a minor component, there is a wide variety of species adapted to this site. Some of the more common species include, winterfat, soapweed yucca, Apache plume, fourwing saltbush, rabbitbrush, Bigelow sagebrush, and broom snakeweed. Scattered piñon and juniper may also occur. Heavy continuous use by livestock typically results in a decrease of many coolseason grasses, the more palatable warm season grasses, winterfat, and fourwing saltbush. A community dominated by blue grama with galleta occurring as the sub-dominant may result. Diagnosis: Grass cover is fairly uniform with few large bare areas present. Shrubs and trees constitute a minor component of the site. Evidence of erosion such as pedestalling of grasses, rills and gullies are infrequent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	353	631	908
Forb	12	21	30
Total	365	652	938

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	10-15%
Forb foliar cover	2-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-15%
Surface fragments >0.25" and <=3"	25-60%
Surface fragments >3"	10-20%
Bedrock	0%
Water	0%
Bare ground	10-20%

Figure 6. Plant community growth curve (percent production by month). NM0305, R035XG114NM-Gravelly-HCPC. Mixed warm/cool-season grassland w/shrub & half-shrub component..

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 Shrub-Encroached

Community 2.1 Shrub-Encroached

Additional States: Shrub-Encroached: This state is characterized by the noticeable increase of rabbitbrush, and decreased cover and production of grasses. Grass cover consists mainly of patchy blue grama, ring muhly, galleta, threeawns and dropseeds. Diagnosis: Rabbitbrush is found at increased densities relative to the Grassland State. Grass cover is patchy with large bare areas present. Blue grama is typically the dominant grass. Evidence of erosion such as pedestalling of plants, rills and gullies may be common. Transition to Shrub Encroached State (1a) Rabbitbrush is a fire adapted species and may increase or quickly occupy burned areas.⁴ Seed production and seedling survival of rabbitbrush is believed to be sensitive to resource competition.² During years of limited rainfall high grass cover may help to suppress shrub seedlings by competing directly for soil moisture. Overgrazing can reduce grass cover and provide competition free areas for the establishment of rabbitbrush seedlings. Key indicators of approach to transition: * Decrease or change in composition or distribution of grass cover. * Increase in size and frequency of bare patches. * Increase in amount of rabbitbrush seedlings. Transition back to Grassland (2b) Brush control is necessary to initiate the transition back to the Grassland state. Chemical control has been shown to be effective in the control of rabbitbrush.^{1,3} Due to its ability to vigorously resprout following disturbance, mechanical brush control methods are generally ineffective unless the plants are severed below the root crown. Prescribed grazing will help ensure adequate rest following brush control and will assist in the establishment and maintenance of grass cover.

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				211-245	
	blue grama	BGCP2	<i>Bouteloua gracilis</i>	211-245	

	blue grama	BOGR2	<i>Bouteloua gracilis</i>	211-243	-
2				7-35	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	7-35	-
3				7-21	
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	7-21	-
4				35-71	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	35-71	-
5				35-71	
	common wolfstail	LYPH	<i>Lycurus phleoides</i>	35-71	-
	spike muhly	MUWR	<i>Muhlenbergia wrightii</i>	35-71	-
6				35-71	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	35-71	-
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	35-71	-
7				35-71	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	35-71	-
8				35-71	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	35-71	-
	squirreltail	ELEL5	<i>Elymus elymoides</i>	35-71	-
9				7-35	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	7-35	-
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	7-35	-
10				7-35	
	threeawn	ARIST	<i>Aristida</i>	7-35	-
	ring muhly	MUTO2	<i>Muhlenbergia torreyi</i>	7-35	-
11				35-105	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	35-105	-
Forb					
12				7-35	
	Forb, perennial	2FP	<i>Forb, perennial</i>	7-35	-
13				7-15	
	Forb, annual	2FA	<i>Forb, annual</i>	7-15	-
Shrub/Vine					
14				7-35	
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	7-35	-
15				7-21	
	soapweed yucca	YUGL	<i>Yucca glauca</i>	7-21	-
17				7-21	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	7-21	-
	Apache plume	FAPA	<i>Fallugia paradoxa</i>	7-21	-
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	7-21	-
	pale desert-thorn	LYPA	<i>Lycium pallidum</i>	7-21	-
18				7-21	
	Bigelow sage	ARBI3	<i>Artemisia bigelovii</i>	7-21	-
	prairie sagebrush	ARBE4	<i>Artemisia frigida</i>	7-21	-

	prairie sagewort	ARFR4	<i>Artemisia tridentata</i>	7-21	-
	rubber rabbitbrush	ERNAN5	<i>Ericameria nauseosa ssp. nauseosa var. nauseosa</i>	7-21	-
	spineless horsebrush	TECA2	<i>Tetradymia canescens</i>	7-21	-
19				7-21	
	Shrub, deciduous	2SD	<i>Shrub, deciduous</i>	7-21	-
Tree					
16				0-21	
	juniper	JUNIP	<i>Juniperus</i>	0-21	-
	twoneedle pinyon	PIED	<i>Pinus edulis</i>	0-21	-

Animal community

Habitat for Wildlife:

This site provides habitat which supports a resident animal community that is characterized by mule deer, bobcat, black-tailed jackrabbit, white-throated woodrat, Merriam's kangaroo rat, Botta's pocket gopher, brush mouse, sparrow hawk, Cassin's kingbird, meadowlark, common raven, chipping sparrow, leopard lizard, plateau whiptail, short-horned lizard, and black-tailed rattlesnake.

Where cliffs and ledges are found associated with the site, golden eagle, great horned owl, prairie falcon, Say's phoebe, white-throated swift, and cliff swallow nest or hunt over the site. Mourning dove and black-chinned sparrow nest on the site. Large rocks or boulders, where found associated with the site, provide habitat for rock squirrels. Where it occurs adjacent to ponderosa pine forests, elk may range in to feed.

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

Alegros-----C
Amenson-----D
Eldado-----B
Gatlin-----B
Gustspring-----B
Guy-----B
Ildefonso-----B
Jaconita-----B
Lapdum-----B
Losmarios-----C
Majada-----B
Mulligan-----B
Millett-----B
Pena-----B
Salas-----C
Sedillo-----B
Sipapu-----C
Tesajo-----B
Truehill-----B
Xenmack-----C

Recreational uses

This site offers fair to good potential for hiking, horseback riding, nature observation, photography, camping and picnicking. It frequently provides good to excellent pronghorn antelope hunting.

Wood products

This site has little 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 to continuous yearlong use if potential natural vegetation is to be maintained. Under such use, cool-season grasses, such as New Mexico feathergrass, needleandthread, western wheatgrass, bottlebrush squirreltail, and Indian ricegrass, frequently decline or even disappear. Prolonged heavy use will also cause the decline of such grasses as sideoats grama, spike muhly, and little bluestem, and the site may become characterized by a high density of low-vigor, sod-like blue grama that may make up to 90 percent of the species composition. Advanced deterioration is characterized by increases in ring muhly, threeawn spp., and rabbitbrush. Production in such instances may be cut to one-third or even one-fourth of the potential.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity-----Index Ac/AUM

100 - 76-----3.4 – 4.7

75 – 51-----4.5 – 6.9

50 – 26-----6.7 – 11.0

25 – 0-----11.0+

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, Cibola, Socorro, Catron and Sandoval Counties.

1. Cluff, G.J., B.A. Roundy, R.A. Evans, and J.A. Young. 1983. Herbicidal control of greasewood (*Sarcobatus vermiculatus*) and salt rabbitbrush (*Chrysothamnus nauseosus* ssp. *consimilis*). *Weed Science*. 31: 275-279.

2. McKell, C. M., and W. W. Chilcote. 1957. Response of Rabbitbrush following removal of competing vegetation. *Journal of Range Management*. 10: 228-230

3. Whisenant, S.G. 1988. Control of threadleaf rubber rabbitbrush with herbicides. *Journal of Range Management*. 41: 470-472

4. Young, R. P. 1983. Fire as a vegetation management tool in rangelands of the Intermountain Region. In: *Fire Effects Information System*, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/>[2004].

Characteristic Soils Are:
Majada Mulligan Pena

Other Soils included are:

Alegros, Amenson, Aridic Ustochrepts, Eldado Gatlin, Gustspring, Gustspring Rocky, Guy Ildefonso, Lapdum, Losmarios, Millett, Salas Sedillo, Tesajo, Typic Ustorthents

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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:**
-