

# Ecological site R035XG114NM Gravelly

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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.

## Ecological site concept

This site occurs as gravelly stream or fan terraces or as low rolling gravelly hills and ridges dissected by natural drainages. Average slopes are less than 35 percent, and aspect is variable. 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.

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Bouteloua gracilis</i> (2) <i>Bouteloua curtipendula</i>

## Physiographic features

This site occurs as gravelly stream or fan terraces or as low rolling gravelly hills and ridges dissected by natural drainages. 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	1,830 – 2,230 m

Slope	0 – 40 %
Water table depth	180 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)	150 days
Freeze-free period (average)	170 days
Precipitation total (average)	410 mm

### Influencing water features

This is an upland site, and is not associated with water features or wetlands. During heavy rain events, this site may receive run-on moisture from landforms above and contribute runoff to landforms below.

### 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
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Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to rapid
Soil depth	50 – 200 cm
Surface fragment cover <=3"	20 – 60 %
Surface fragment cover >3"	10 – 20 %
Available water capacity (0-101.6cm)	7.62 – 15.24 cm
Calcium carbonate equivalent (0-101.6cm)	10 – 20 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	6.6 – 10
Subsurface fragment volume <=3" (Depth not specified)	30 – 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

Figure 3. WP-2 36B State and Transition Gravelly Site

## Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (t)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				213-247	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	211-245	–
2				11-34	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	7-35	–
3				11-21	
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	7-21	–
4				34-67	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	35-71	–
5				34-67	
	common wolfstail	LYPH	<i>Lycurus phleoides</i>	35-71	–
	spike muhly	MUWR	<i>Muhlenbergia wrightii</i>	35-71	–
6				34-67	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	35-71	–
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	35-71	–
7				34-67	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	35-71	–
8				34-67	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	35-71	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	35-71	–
9				11-34	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	7-35	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	7-35	–
10				11-34	
	threeawn	ARIST	<i>Aristida</i>	7-35	–
	ring muhly	MUTO2	<i>Muhlenbergia torreyi</i>	7-35	–
11				34-101	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	35-105	–
<b>Forb</b>					
12				11-34	
	Forb, perennial	2FP	<i>Forb, perennial</i>	7-35	–
13				11	
	Forb, annual	2FA	<i>Forb, annual</i>	7-15	–
<b>Shrub/Vine</b>					
14				11-34	
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	7-35	–

15				11-22	
	soapweed yucca	YUGL	<i>Yucca glauca</i>	7-21	-
17				11-22	
	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				11-22	
	Bigelow sage	ARBI3	<i>Artemisia bigelovii</i>	7-21	-
	prairie sagewort	ARFR4	<i>Artemisia frigida</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				11-22	
	Shrub, deciduous	2SD	<i>Shrub, deciduous</i>	7-21	-
<b>Tree</b>					
16				0-22	
	juniper	JUNIP	<i>Juniperus</i>	0-21	-
	twoneedle pinyon	PIED	<i>Pinus edulis</i>	0-21	-

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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## 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

## Contributors

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## Approval

Kendra Moseley, 5/19/2025

## 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	04/17/2026
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

### Indicators

**1. Number and extent of rills:**

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**2. Presence of water flow patterns:**

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**3. Number and height of erosional pedestals or terracettes:**

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**4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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**5. Number of gullies and erosion associated with gullies:**

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**6. Extent of wind scoured, blowouts and/or depositional areas:**

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**7. Amount of litter movement (describe size and distance expected to travel):**

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**8. Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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**9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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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:**

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