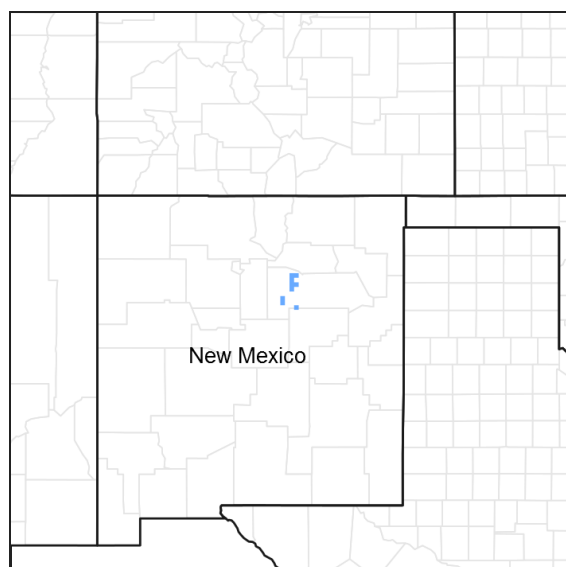


# **Ecological site R070AY016NM** **Gravelly Upland**

Last updated: 9/12/2023  
 Accessed: 05/19/2024

## **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.

## **Ecological site concept**

This site occurs on upland soils that contain high fragment content in surface and at least some subsurface layers. Slopes are quite variable.

This site correlates to the Sandy ecological site group.

## **Similar sites**

GX070A01X019	<b>Gravelly Terraces</b> The Gravelly Terraces site is an analog in LRU 70A.1.
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**Table 1. Dominant plant species**

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

## **Physiographic features**

This site occurs on hilly convex river terrace remnants, cuestas, mesas, and fans along mountain foot slopes.

Slopes are convex and range from 1 to 25 percent on all aspects. Elevation ranges from 4,300 to 7,500 feet.

**Table 2. Representative physiographic features**

Landforms	(1) Terrace (2) Fan (3) Fan remnant
Flooding duration	Extremely brief (0.1 to 4 hours) to very brief (4 to 48 hours)
Flooding frequency	None to rare
Ponding duration	Very brief (4 to 48 hours)
Ponding frequency	None to rare
Elevation	1,311–2,286 m
Slope	1–25%
Aspect	Aspect is not a significant factor

## Climatic features

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

Precipitation averages 14 to 16 inches. Seventy seven percent of the year’s moisture normally falls during the period of May through October. Practically all of it is brought by brief afternoon and evening thunderstorms. In July and August, normally the wettest months of the year, one can expect about one day in five when rainfall exceeds one-tenth inch. Early spring precipitation in May benefits the cool-season plants. Winter precipitation, supplying 24 percent of the year’s moisture, normally has no more than two days a month with as much as one-tenth inch of moisture. Much of the winter precipitation falls as snow.

Air temperatures vary from a monthly mean of 20 degrees F in January to 69 degrees F in July. Daily high temperatures average in the 80’s and low 90’s during the summer. Winter low temperatures fall below the freezing mark much of the time from November through March with minimum temperatures approaching 25 degrees F below zero. Dates of the last killing frost may vary from May 9th through May 17th, and the first killing frost from September 27th to October 8th. The frost-free season ranges from 141 days to 153 days from early May to early October.

Wind velocities for the area average 10 to 12 miles per hour and prevail from the south and southwest. Generally, March is the windiest month. Strong winds during the spring cause rapid drying of the soil surface.

Nearby mountains to the west intercept much of the precipitation from the Pacific storms coming through this area during the winter. About 70 percent of the 14 to 16 inches of annual precipitation falls in the form of rainfall during the frost-free season. About 40 percent of the annual precipitation benefits cool-season plants, 50 percent benefits warm-season plants and 10 percent falls during the season of plant dormancy. Relative humidity is moderately low. The sun shines approximately 75 percent of the time.

Climate data was obtained from <http://www.wrcc.sage.dri.edu/summary/climsmnm.html> web site using 50 percent 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)	149 days
Freeze-free period (average)	171 days
Precipitation total (average)	406 mm

## Influencing water features

Site may occur along drainageways at toe of foot slopes. Dry washes and riverine systems may occur in this area.

## Soil features

Soils are moderately deep to deep and well to somewhat excessively drained. Surface textures are gravelly sandy clay loam, or gravelly sandy loam or gravelly clay loam with about 18 to 30 percent clay. Substratum is a gravelly sandy clay loam, or gravelly sandy loam or gravelly clay loam with about 18 to 30 percent clay with a calcic horizon between 12 and 40 inches. Underlying material is a gravelly loam and gravelly sandy loam (sand, loamy sand, or sandy loam with 0 to 85 percent pebbles).

They have moderate permeability. The available water holding capacity is low to moderate. The effective rooting depth is 40 to 60 inches. Air and water move freely through these soils.

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

Characteristic Soils:

Tinaja

**Table 4. Representative soil features**

Surface texture	(1) Gravelly loam (2) Sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to excessively drained
Permeability class	Moderate to very rapid
Soil depth	102 cm
Surface fragment cover <=3"	15–35%
Surface fragment cover >3"	0–10%
Available water capacity (0-101.6cm)	9.14–13.97 cm
Calcium carbonate equivalent (0-101.6cm)	15–40%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	20–80%
Subsurface fragment volume >3" (Depth not specified)	0–30%

## Ecological dynamics

As the ecological condition deteriorates , it is accompanied by a sharp decrease in plant cover. When adequate plant cover is lacking, this site is subject to severe sheet and gully erosion due to a very slow water intake rate.

A system of deferred grazing which varies the time of grazing and rest in a pasture during successive years is needed to maintain or improve the plant community. Rest during April , May, and June allows western wheatgrass to grow and reproduce. Rest during the summer is beneficial to warm season plants such as blue grama, alkali sacaton, vine mesquite, and sideoats grama. Spring rest will also allow alkali sacaton sufficient time to green up before grazing.

Text from the Grazing Section that is relevant to plant ecology:

Approximately 80 percent of the total annual yield is from species that furnish forage for grazing or browsing. Continuous grazing during the growing season will cause the more desirable forage plants such as western wheatgrass, vine mesquite, sideoats grama, alkali sacaton, fourwing saltbush, and winterfat to decrease. Species most likely to invade include sleepygrass and broom snakeweed. Species most likely to increase are blue grama, galleta, buffalograss, mat muhly, cholla cactus, plains pricklypear, and oneseed juniper.

## State and transition model

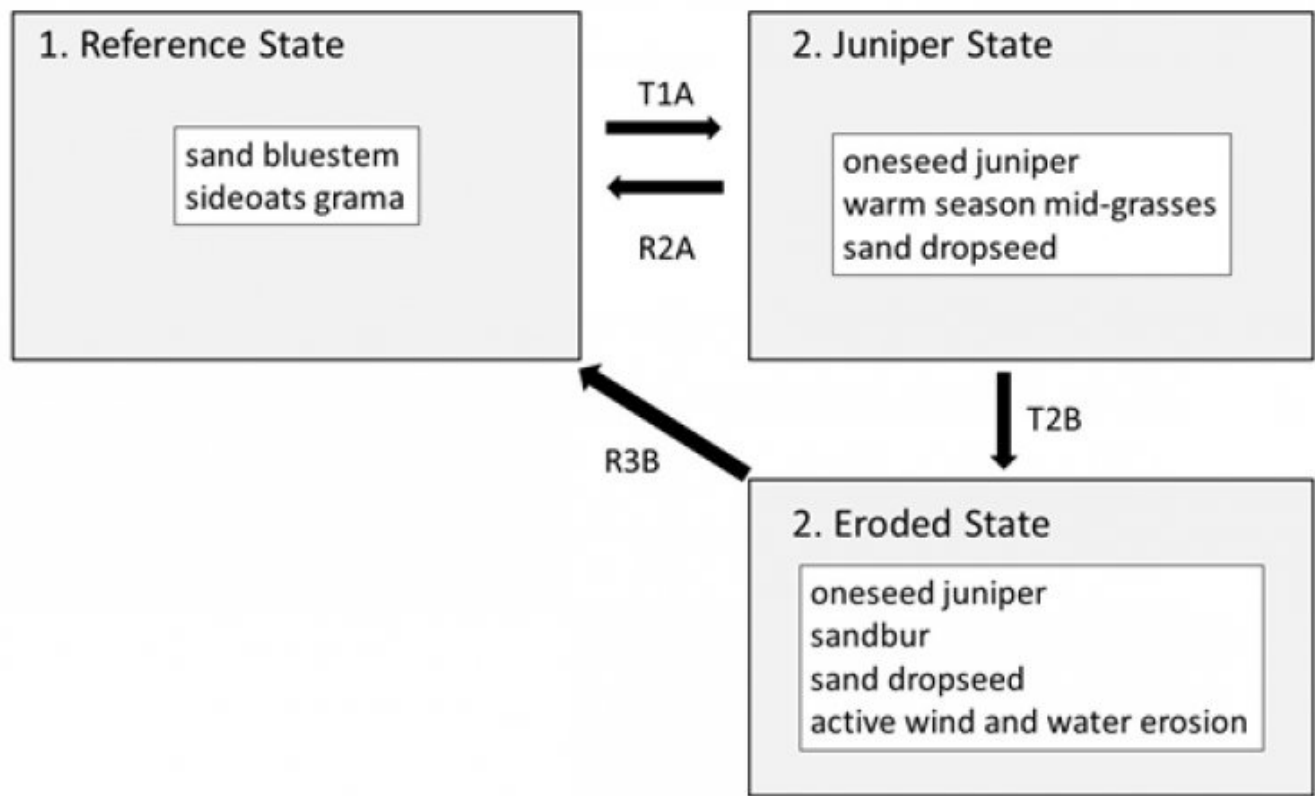


Figure 4. Generalized STM for sandy sites

## State 1 Reference State

### Community 1.1 Reference Plant Community

This is a plant community that is dominated by mid-grasses, with scattered woody species making up an important part of the plant community. Perennial and annual forbs are evenly distributed and make up a minor part of the community. Blue grama, alkali sacaton, and western wheatgrass are the most abundant species. Grasses make up 75 percent of the composition, woody species make up about 15 percent, and forbs make up about 10 percent. The potential plant community produces approximately 1,300 pounds per acre of air dry grasses, forbs, and shrubs during years with favorable growing conditions and about 600 pounds per acre during unfavorable years. The average production is about 950 pounds per acre.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	516	785	1110
Shrub/Vine	56	168	235
Forb	56	101	112
<b>Total</b>	<b>628</b>	<b>1054</b>	<b>1457</b>

Table 6. Ground cover

Tree foliar cover	2-5%
Shrub/vine/liana foliar cover	15-20%
Grass/grasslike foliar cover	30-40%
Forb foliar cover	10-15%
Non-vascular plants	0%
Biological crusts	0%
Litter	10-15%
Surface fragments >0.25" and <=3"	2-5%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	40-45%

Figure 6. Plant community growth curve (percent production by month). NM3716, R070AY016NM Gravelly Upland HCPC. R070AY016NM Gravelly Upland HCPC.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	7	10	15	20	25	13	5	0	0

## State 2

### Degraded

This state is generally dominated by such plants as blue grama, broom snakeweed, galleta, buffalograss, mat muhly, cholla cactus, plains pricklypear, oneseed juniper, and sleepygrass.

## Transition T1A

### State 1 to 2

Season-long grazing providing little rest and recovery for preferred grazed plants during critical growing periods, coupled with high utilization.

## Restoration pathway R2A

### State 2 to 1

Restoration pathway resulting from the implementation of prescribed grazing.

### Conservation practices

Grazing Management Plan - Applied
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## 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	Short Warm Season			34–359	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	62–118	–
	vine mesquite	PAOB	<i>Panicum obtusum</i>	34–86	–
	plains muhly	MUCU3	<i>Muhlenbergia cuspidata</i>	20–73	–
	ring muhly	MUTO2	<i>Muhlenbergia torreyi</i>	20–73	–

	spike muhly	MUWR	<i>Muhlenbergia wrightii</i>	20–73	–
	buffalograss	BODA2	<i>Bouteloua dactyloides</i>	20–73	–
2	<b>Tall Warm Season</b>			101–291	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	62–118	–
3	<b>Tall Cool Season Stolon</b>			224–673	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	129–173	–
4	<b>Mid warm season stolon</b>			34–146	
	galleta grass	PLEUR12	<i>Pleuraphis</i>	34–86	–
5	<b>Tall warm season</b>			34–146	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	34–146	–
6	<b>Short Coarse warm season</b>			11–26	
	threeawn	ARIST	<i>Aristida</i>	20–39	–
	eastern bottlebrush grass	ELHYH	<i>Elymus hystrix</i> var. <i>hystrix</i>	11–26	–
<b>Shrub/Vine</b>					
7	<b>Mid palatable drought tolerant</b>			34–146	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	34–86	–
8	<b>short high protein</b>			22–34	
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	20–39	–
9	<b>Low durable deciduous</b>			22–34	
	Gambel oak	QUGA	<i>Quercus gambelii</i>	20–39	–
11	<b>Cactus</b>			11–56	
	tree cholla	CYIM2	<i>Cylindropuntia imbricata</i>	7–36	–
	cactus apple	OPEN3	<i>Opuntia engelmannii</i>	7–36	–
13	<b>Wolf Berry</b>			11–34	
	Berlandier's wolfberry	LYBE	<i>Lycium berlandieri</i>	7–29	–
14	<b>Yucca</b>			11–34	
	soapweed yucca	YUGL	<i>Yucca glauca</i>	3–29	–
15	<b>Sagewort</b>			0–34	
	field sagewort	ARCA12	<i>Artemisia campestris</i>	3–29	–
<b>Forb</b>					
10	<b>perennial forbs</b>			11	
	hairy ragweed	AMCA7	<i>Ambrosia canescens</i>	11–34	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	11–34	–
	buckwheat	ERIOG	<i>Eriogonum</i>	3–29	–
	Wright's spiderwort	TRWR	<i>Tradescantia wrightii</i>	7–15	–
<b>Tree</b>					
12	<b>Juniper</b>			11–34	
	Rocky Mountain juniper	JUSC2	<i>Juniperus scopulorum</i>	7–36	–

## Animal community

Wildlife: This site provides habitat for mule Deer, coyote, desert cottontail, thirteen-lined ground squirrel, marsh hawk, scaled quail, roadrunner, western racer, and woodhouse toad.

## Hydrological functions

Characteristic Soil Series-----Hydrologic Group

Tinaja-----B

## Recreational uses

This site has attractive aesthetic appeal and natural beauty. It is fair for camping, hiking, and picnicking. Hunting is fair for deer, rabbits, and quail.

## Wood products

Limited wood from juniper for firewood unless site is heavily encroached by juniper and piñon trees.

## Other products

Guide to initial Stocking rates as Acres per Animal Unit Month.

Range Condition-----AC/AUM

100%-----2.5 to 3

75%-----2.9 to 4.6

50%-----4.5 to 9.0

25%-----9.1 plus

## Other information

Grazing: This site can be used any season of the year by all classes of grazing animals. Approximately 80 percent of the total annual yield is from species that furnish forage for grazing or browsing. A variety of grasses, forbs and shrubs provide good nutrition to grazing and browsing animals. Continuous grazing during the growing season will cause the more desirable forage plants such as western wheatgrass, vine mesquite, sideoats grama, alkali sacaton, fourwing saltbush, and winterfat to decrease. Species most likely to invade include sleepygrass and broom snakeweed. Species most likely to increase are blue grama, galleta, buffalograss, mat muhly, cholla cactus, plains pricklypear, and oneseed Juniper.

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## Contributors

Don Sylvester  
John E. Tunberg  
John Tunberg

## 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	05/19/2024
Approved by	Kendra Moseley
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):**

- 
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:**
-