

## **Ecological site R042BE053NM** **Gravelly Sand, Cool Desert Grassland**

Accessed: 05/12/2025

### 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 upland site is relatively level to undulating alluvial fans, fan terrace, fan remnant. Inclusions of narrow swales and drainageways are commonly associated with this site. Slopes are 5 to 30 percent (0-15 % common). Elevations are from 4,500 feet above sea level to 5,500 feet.

**Table 2. Representative physiographic features**

Landforms	(1) Alluvial fan (2) Fan remnant (3) Fan piedmont
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	None to occasional
Ponding frequency	None
Elevation	1,463–1,676 m
Slope	5–30%
Water table depth	152–183 cm
Aspect	Aspect is not a significant factor

### Climatic features

This site has an arid climate with distinct seasonal temperature variations and large annual and diurnal temperature changes characteristic of a continental climate.

Precipitation averages 8 to 10 inches annually. Deviations of 4 inches or more from the average are quite common. Fifty percent of the precipitation is received from July to November, which is the dominant growing season of native plants. Summer precipitation is characterized by high-intensity, short-duration rainstorms. Winter precipitation averages less than one half inch per month, usually in the form of rain. There are occasional snowstorms of short

duration.

Temperatures vary from a mean monthly average of 77 F in July to 34 F in January, with a maximum of 104 F and a minimum of -10 F. The average last killing frost in spring is April 15, and the average first killing frost in fall is October 28. Frost-free season averages 185 days. Temperatures are conducive to native grass and forb growth from March through November.

Spring winds of 15 to 40 miles per hour are common from February to June. These winds increase transpiration rates of native plants and rapidly dry the surface soil. Small soil particles are often displaced by the wind near the soil surface often resulting in structural damage to native plants, especially young seedlings.

Climate data was obtained from <http://www.wrcc.sage.dri.edu/summary/climsmnm.html> 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)	152 days
Freeze-free period (average)	201 days
Precipitation total (average)	229 mm

## Influencing water features

This site is not influenced by water from wetland or stream.

## Soil features

These moderately sloping to moderately steep gravelly soils are well drained. Surface textures are very gravelly sandy loam, gravelly fine sandy loam, gravelly loam, gravelly sand. Substrata are calcareous gravelly or very gravelly loamy sand, loam, sandy loam, or loamy sand.

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

Characteristic Soils Are:

Arizo  
Bluepoint  
Caliza  
Nickel  
Stumble  
Kokan

**Table 4. Representative soil features**

Surface texture	(1) Gravelly sandy loam (2) Gravelly fine sandy loam (3) Gravelly loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderately rapid to very rapid
Soil depth	152–183 cm
Surface fragment cover <=3"	0–25%
Surface fragment cover >3"	0–2%

Available water capacity (0-101.6cm)	5.08–22.86 cm
Calcium carbonate equivalent (0-101.6cm)	1–10%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–4
Soil reaction (1:1 water) (0-101.6cm)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	0–25%
Subsurface fragment volume >3" (Depth not specified)	0–5%

## Ecological dynamics

The aspect and biomass of vegetation on this site is predominantly grassland characterized by short- and mid-grasses. Perennial shrubs, half-shrubs, and forbs are present in appreciable amounts. Annual forbs and grasses occur in relatively large amounts in years of above-average growing conditions. When the plant community deteriorates, there is a marked increase in shrubs, half-shrubs, and cacti. Mesquite often invades this site. A microsite within this site may have creosotebush as 10 percent of the total composition.

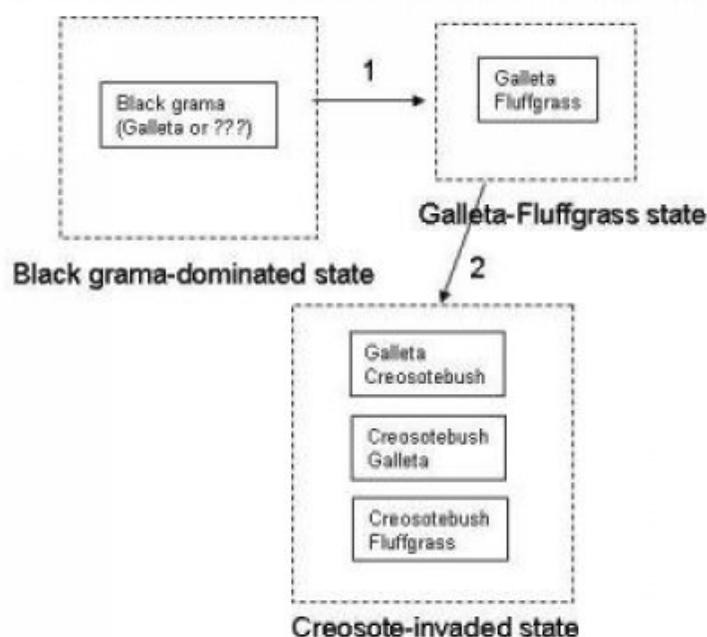
Other grasses that could appear on this site include: fluffgrass, ring muhly, and six-weeks grama.

Other woody plants include creosote bush.

Other forbs include: desert senna, globemallow, prickly poppy, and yerba-de-pasma

## State and transition model

# State-Transition model: MLRA 42, SD-1: Gravelly Sand



## State 1 Historic Climax Plant Community

### Community 1.1 Historic Climax Plant Community

The aspect and biomass of vegetation on this site is predominantly grassland characterized by short- and mid-grasses. Perennial shrubs, half-shrubs, and forbs are present in appreciable amounts. Annual forbs and grasses occur in relatively large amounts in years of above-average growing conditions. When the plant community deteriorates, there is a marked increase in shrubs, half-shrubs, and cacti. Mesquite often invades this site. A microsite within this site may have creosotebush as 10 percent of the total composition. Other grasses that could appear on this site include: fluffgrass, ring muhly, and six-weeks grama. Other woody plants include creosote bush. Other forbs include: desert senna, globemallow, prickly poppy, and yerba-de-pasma.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	252	378	504
Shrub/Vine	50	76	101
Forb	34	50	67
<b>Total</b>	<b>336</b>	<b>504</b>	<b>672</b>

Figure 7. Plant community growth curve (percent production by month).  
NM2221, R042XA053NM-Gravelly Sand-Warm Season Plants-HCPC.

R042XA053NM-Gravelly Sand-Warm Season Plants-HCPC.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	5	10	10	25	30	12	5	0	0

Figure 8. Plant community growth curve (percent production by month).  
NM2222, R042XA053NM-Gravelly Sand-Cool Season Plants-HCPC.  
R042XA053NM-Gravelly Sand-Cool Season Plants-HCPC.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	15	20	20	2	5	10	15	13	0	0

State 2  
Creosote-Invaded State

Community 2.1  
Crosote/Galleta



Figure 9. Creosote/Galleta

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Warm Season			151–202	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	151–202	–
2	Warm Season			50–76	
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	50–76	–
3	Warm Season			26–50	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	26–50	–
4	Cool Season			76–101	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	76–101	–
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	76–101	–
5	Cool Season			26–50	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	26–50	–
6	Warm Season			26–50	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	26–50	–
7	Warm Season			50–76	
	lanceleaf galleta	BOGA	<i>Bouteloua lanceolata</i>	50–76	

	James galleta	PLJA	<i>Pleurapnis jamesii</i>	50–70	–
8	<b>Warm Season</b>			10–40	
	threeawn	ARIST	<i>Aristida</i>	10–40	–
9	<b>Warm Season</b>			26–50	
	white tridens	TRAL2	<i>Tridens albescens</i>	26–50	–
10	<b>Warm Season</b>			26–50	
	slim tridens	TRMUE	<i>Tridens muticus</i> var. <i>elongatus</i>	26–50	–
11	<b>Warm Season</b>			10–40	
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	10–40	–
12	<b>Warm Season</b>			26–50	
	silver bluestem	BOSA	<i>Bothriochloa saccharoides</i>	26–50	–
13	<b>Cool Season</b>			26–50	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	26–50	–
<b>Shrub/Vine</b>					
14	<b>Shrub</b>			10–26	
	yerba de pasmo	BAPT	<i>Baccharis pteronioides</i>	10–26	–
	pale desert-thorn	LYPA	<i>Lycium pallidum</i>	10–26	–
15	<b>Shrub</b>			10–26	
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	10–26	–
16	<b>Shrub</b>			16–40	
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	16–40	–
17	<b>Shrub</b>			10–26	
	littleleaf ratany	KRER	<i>Krameria erecta</i>	10–26	–
18	<b>Cacti</b>			6–16	
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	6–16	–
<b>Forb</b>					
19	<b>Forb</b>			0–10	
	fiddleneck	AMSIN	<i>Amsinckia</i>	0–10	–
20	<b>Forb</b>			0–10	
	Adonis blazingstar	MEMU3	<i>Mentzelia multiflora</i>	0–10	–
21	<b>Forb</b>			0–10	
	ragwort	SENEC	<i>Senecio</i>	0–10	–
22	<b>Forb</b>			0–16	
	buckwheat	ERIOG	<i>Eriogonum</i>	0–16	–
23	<b>Forb</b>			0–10	
24	<b>Forb</b>			0–16	
	purple locoweed	OXLA3	<i>Oxytropis lambertii</i>	0–16	–
25	<b>Forb</b>			0–10	
	western horsenettle	SODI	<i>Solanum dimidiatum</i>	0–10	–
26	<b>Forb</b>			6–16	
	fleabane	ERIGE2	<i>Erigeron</i>	6–16	–

## Animal community

This site provides habitats which support a resident animal community that is characterized by coyote, black-tailed

jack rabbit, desert cottontail, Merriam's kangaroo rat, southern plains woodrat, scaled quail, house finch, loggerhead shrike, prairie rattlesnake, glossy snake, and little striped whiptail.

## Hydrological functions

The runoff curve numbers are determined by field investigations using hydraulic cover conditions and hydrologic soil groups.

Hydrologic Interpretations

Soil Serie Hydrologic Group

Nickel B

Kokan A

Scholle B

Caliza A

## Recreational uses

This site has limited potential for recreational use.

## Wood products

This site has no potential for wood products.

## Other products

This site is well suited for year-long grazing use by cattle, sheep, horses, antelope, and burros.

## Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index----Ac/AUM

100 - 76-----4.3 – 5.7

75 – 51-----5.5 - 8.6

50 – 26-----8.4 – 17.1

25 – 0-----17.1 +

## Other references

Other References:

Data collection for this site was done in conjunction with the progressive soil surveys within the Southern Desertic Basins, Plains and Mountains, Major Land Resource Area 42, of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Valencia, Socorro, and Bernalillo.

## Contributors

Brandon Bestelmeyer

Don Sylvester

Jason S. Martin

Michael Carpinelli

Santiago Misquez

## 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:**
-