

Ecological site R042BE054NM

Deep Sand, Cool Desert Grassland

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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.

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 has relatively moderate slopes of 1 to 15 percent. The topography is often undulating; sand dunes are common. This site occurs on mesas and fans in the vicinity of major streams such as the Rio Puerco and Rio Grande. Elevations are from 4,500 to 5,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Dune
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Rare to occasional
Ponding frequency	None
Elevation	1,372–1,676 m
Slope	1–15%
Water table depth	89–183 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. This results in structural damage to native plants, especially young seedlings.

Table 3. Representative climatic features

Frost-free period (average)	165 days
Freeze-free period (average)	213 days
Precipitation total (average)	254 mm

Influencing water features

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

Soil features

Soils are deep and very deep. Surface textures are loamy sand, loamy fine sand, or fine sand. Subsoil are sandy clay loam, fine sandy loam, or sandy loam except Bluepoint, which has no subsoil but has a loamy sand substratum. The percent calcium carbonate in the subsoils may be as high as 9.0. These soils are from mixed sources and are wind-deposited.

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

Characteristic Soils Are:

- Bluepoint
- Vinton
- Pajarito
- Wink
- Madurez
- Gila
- Stumble

Table 4. Representative soil features

Surface texture	(1) Loamy sand (2) Loamy fine sand (3) Fine sand
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to rapid
Soil depth	183 cm
Surface fragment cover <=3"	0-10%
Surface fragment cover >3"	0%

Available water capacity (0-101.6cm)	15.24–25.4 cm
Calcium carbonate equivalent (0-101.6cm)	1–7%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–20%
Subsurface fragment volume >3" (Depth not specified)	0–1%

Ecological dynamics

The aspect and biomass of vegetation on this site is predominately grassland with an appreciable amount of shrubs. The grasslands consist of a mixture of short-, mid-, and tall grasses. Annual grasses and forbs occur in relatively large amounts in years of above-average growing conditions. When the plant community deteriorates, there is a marked increase of woody and succulent plants. Mesquite and juniper may invade the site. In severe deterioration of the vegetation, there will be active soil erosion resulting in denuded sand dunes.

The potential plant community produces approximately 900 pounds per acre (air-dry) during years of favorable growing conditions and about 300 pounds during unfavorable years. The total average annual production is approximately 500 pounds.

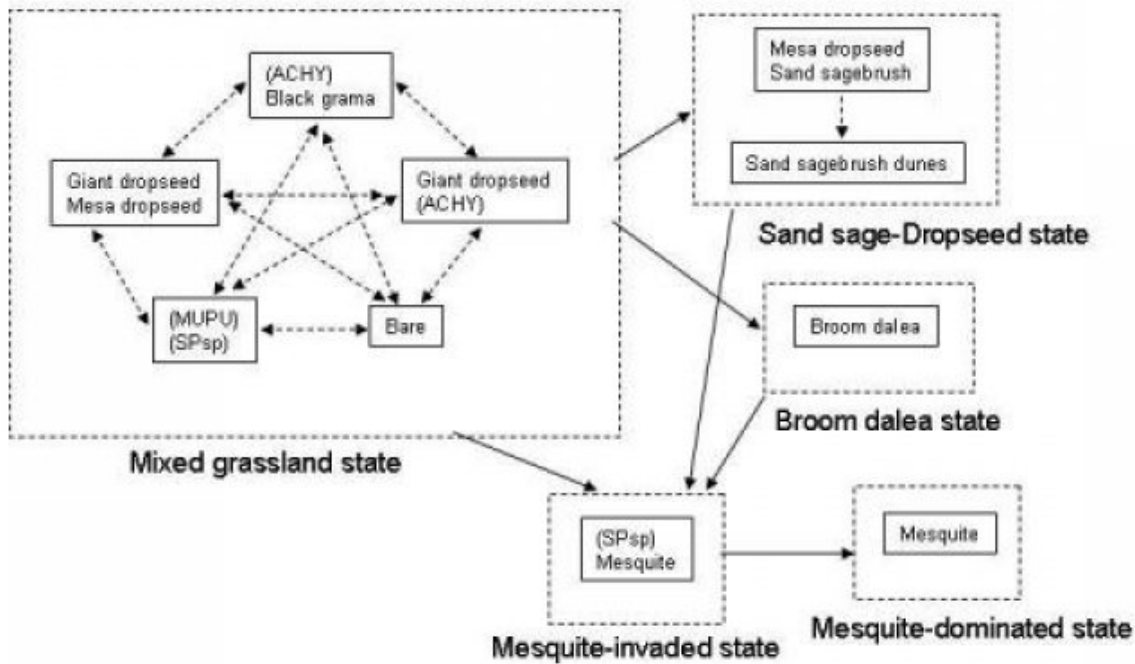
Other grasses that could appear on this site include: six-weeks grama, sand muhly, blue grama, foxtail barley, bottlebrush squirreltail, tumblegrass, and threeawn spp.

Other woody plants include: No others identified in Range site description.

Other forbs include: tansymustard, stickleaf, globemallow, silverleaf nightshade, locoweed, woolly groundsel, and Indian paintbrush.

State and transition model

State-Transition model: MLRA 42, SD-1: Deep Sand



State 1 Historic Climax Plant Community

Community 1.1 Historic Climax Plant Community

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Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	202	404	605
Shrub/Vine	84	168	252
Forb	50	101	151
Total	336	673	1008

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	10%
Grass/grasslike foliar cover	15%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	0%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	70%

Figure 5. Plant community growth curve (percent production by month).
NM2231, R042XA054NM-Deep Sand-Warm Season Plant-HCPC. SD-1 Deep Sand HCPC Warm Season Plant Community.

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 6. Plant community growth curve (percent production by month).
NM2232, R042XA054NM-Deep Sand-Cool Season Plant-HCPC. SD-1 HCPC Deep Sand Cool Season Plant Community.

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

Sand sage - Dropseed state

Community 2.1

Mesa dropseed / Sand sagebrush



Figure 7. Mesa dropseed / Sand sagebrush

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	Warm Season			101–135	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	101–135	–
2	Warm Season			81–101	
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	81–101	–
3	Warm Season			34–54	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	34–54	–
4	Warm Season			67–101	
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	67–101	–
	mesa dropseed	SPFL2	<i>Sporobolus flexuosus</i>	67–101	–
5	Warm Season			20–34	
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	20–34	–
6	Cool Season			135–168	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	135–168	–
7	Warm Season			67–101	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	67–101	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	67–101	–
8	Warm Season			67–101	
	sand bluestem	ANHA	<i>Andropogon hallii</i>	67–101	–
	giant dropseed	SPGI	<i>Sporobolus giganteus</i>	67–101	–
9	Warm Season			20–34	
	sandhill muhly	MUPU2	<i>Muhlenbergia pungens</i>	20–34	–
10	Cool Season			34–67	
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	34–67	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	34–67	–
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	34–67	–
Shrub/Vine					
11	Shrub			13–34	

	yucca	YUCCA	<i>Yucca</i>	13–34	–
12	Cacti			13–34	
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	13–34	–
13	Cacti			7–34	
14	Shrub			34–67	
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	34–67	–
15	Shrub			7–20	
	mormon tea	EPVI	<i>Ephedra viridis</i>	7–20	–
16	Shrub			13–34	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	13–34	–
17	Shrub			7–20	
	spearmint	MESP3	<i>Mentha spicata</i>	7–20	–
	broom dalea	PSSC6	<i>Psoralea scoparius</i>	7–20	–
18	Shrub			13–34	
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	13–34	–
19	Shrub			13–34	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	13–34	–
	desertbroom	BASA2	<i>Baccharis sarothroides</i>	13–34	–
	rubber rabbitbrush	ERNAN5	<i>Ericameria nauseosa ssp. nauseosa var. nauseosa</i>	13–34	–
Forb					
20	Forb			13–34	
	buckwheat	ERIOG	<i>Eriogonum</i>	13–34	–
21	Forb			20–34	
	fiddleneck	AMSIN	<i>Amsinckia</i>	20–34	–
	Russian thistle	SAKA	<i>Salsola kali</i>	20–34	–
22	Forb			20–34	
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	20–34	–
	fleabane	ERIGE2	<i>Erigeron</i>	20–34	–
	desertsenna	SEAR8	<i>Senna armata</i>	20–34	–
	verbena	VEPO4	<i>Verbena polystachya</i>	20–34	–

Animal community

This site provides habitats which support a resident animal community that is characterized by badger, desert cottontail, spotted ground squirrel, Botta's pocket gopher, Ord's kangaroo rat, plains pocket mouse, burrowing owl, scaled quail, mourning dove, loggerhead shrike, lesser earless lizard, and New Mexico whiptail. When woody vegetation or cattails are present, these sites are breeding areas for mockingbird, mourning dove, and roadrunner.

Hydrological functions

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

Soils are in hydrologic group B, with the following exceptions.

Hydrologic Interpretations

Soil Series Hydrologic Group
Bluepoint A
Vinton B
Pajarito B
Wink A
Madurez B
Gila A
Anthony B

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 only fairly suited for year-long grazing use by cattle, sheep, horses, burros, antelope, and deer due to the fragile nature of the plant community and potential for severe soil erosion.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index-----Ac/AUM

100 - 76-----3.2 – 4.2

75 – 51-----4.1 – 6.4

50 – 26-----6.3 – 12.7

25 – 0-----12.7 +

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

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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:**
-