

Ecological site R042AD006NM

Shallow Sandy, Dry Mixed Prairie

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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on shallow, well drained soils that formed in alluvium modified by eolian sands above and below the very slowly permeable petrocalcic horizon. These soils are on alluvial fans and fan remnants. Slopes range from 0 to 5 percent and may range up to 10 percent. Elevations range from approximately 4700 to 6000 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Fan remnant (2) Alluvial fan
Flooding frequency	None
Ponding frequency	None
Elevation	1,433–1,829 m
Slope	1–5%
Aspect	Aspect is not a significant factor

Climatic features

Average precipitation for this site is approximately 12 to 14 inches. Variations of 5 inches are not uncommon. Approximately 75 percent occurs from May through October with most of the rainfall occurring from July to September. Most of the summer precipitation comes in the form of high intensity, short duration thunderstorms. Rain and snow of low intensity characterize the limited winter precipitation.

Temperatures are mild. Freezing temperatures are common at night from December through April, however, temperatures during the day are frequently above 50 degrees F. Occasionally in December to February brief periods of 0 degrees F. temperatures may be expected. During June to August some days may exceed 100 degrees F.

The mean annual precipitation figures are derived from rain gauge data collected by the BLM (1971 to 1990), and NOAA weather maps utilizing prism model estimation techniques. There are no permanent weather stations within

the boundaries of the Land Resource Unit.

**Table 3. Representative climatic features**

Frost-free period (average)	180 days
Freeze-free period (average)	185 days
Precipitation total (average)	356 mm

## Influencing water features

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

## Soil features

The soils on this site are very shallow to shallow, less than 20 inches in depth. Surface layer is very fine sandy loam. Subsurface textures are loam, sandy clay loam or clay loam. An indurated caliche layer (petrocalcic) occurs at depths of 8 to 20 inches with an average depth of 15 inches from the surface. The soils are well drained and have moderately slow permeability above and below the very slowly permeable petrocalcic horizon. The petrocalcic horizon restricts water movement and plant root penetration. Available water holding capacity is low.

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

Characteristic soils:

Jerag

**Table 4. Representative soil features**

Surface texture	(1) Very fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow
Soil depth	15–48 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	5.08–7.62 cm
Calcium carbonate equivalent (0-101.6cm)	0–40%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–1
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	2–11%
Subsurface fragment volume >3" (Depth not specified)	0%

## Ecological dynamics

The Shallow Sandy ecological site occurs as a distinct unit adjacent to or as a component associated with both the

Gravelly and Limy ecological sites. When the shallow sandy site occurs associated with the Limy site, the Limy site occupies a lower slightly concave or bottom (inset fan) position of the piedmont slope, whereas the Shallow Sandy site is situated on the more convex side slopes or top position on the piedmont slope. Where the Shallow Sandy site and the Gravelly site occur together, they intergrade and form a mosaic where there is no apparent distinction in landscape position.

The aspect of this site is open grassland sparsely dotted with shrubs. Black grama and blue grama are the dominant species. Forb production and composition fluctuates both seasonally and from year to year. Some of the more common forbs include globemallow, croton and bladderpod. Characteristic shrubs include winterfat, banana and soap tree yucca, four-wing saltbush, prickly pear and cholla. This site is subject to invasion by creosotebush. Drought, overgrazing, or a combination of the two can initiate the transition from grassland to shrubinvaded state. Above average winter precipitation may also favor the encroachment of shrubs. Seed dissemination by rodents and lagomorphs can aid in the establishment of creosotebush. Fire suppression may also play a part by allowing shrub seedlings to survive and flourish which otherwise may have been killed or kept in check by natural fire regimes.<sup>2</sup> Creosotebush invasion may be facilitated by proximity to areas where creosotebush is already established. Once creosotebush is established, prescribed grazing may be necessary to alter the path to shrub dominance. The continued reduction of grass cover, resource competition, climate, fire suppression, and erosion are factors that enhance the probability of the site becoming dominated by creosotebush. Edaphic characteristics, fire suppression, seed dispersal, climate and grazing may all play a part in the transition to Grass/Succulent Mix state.

## State and transition model

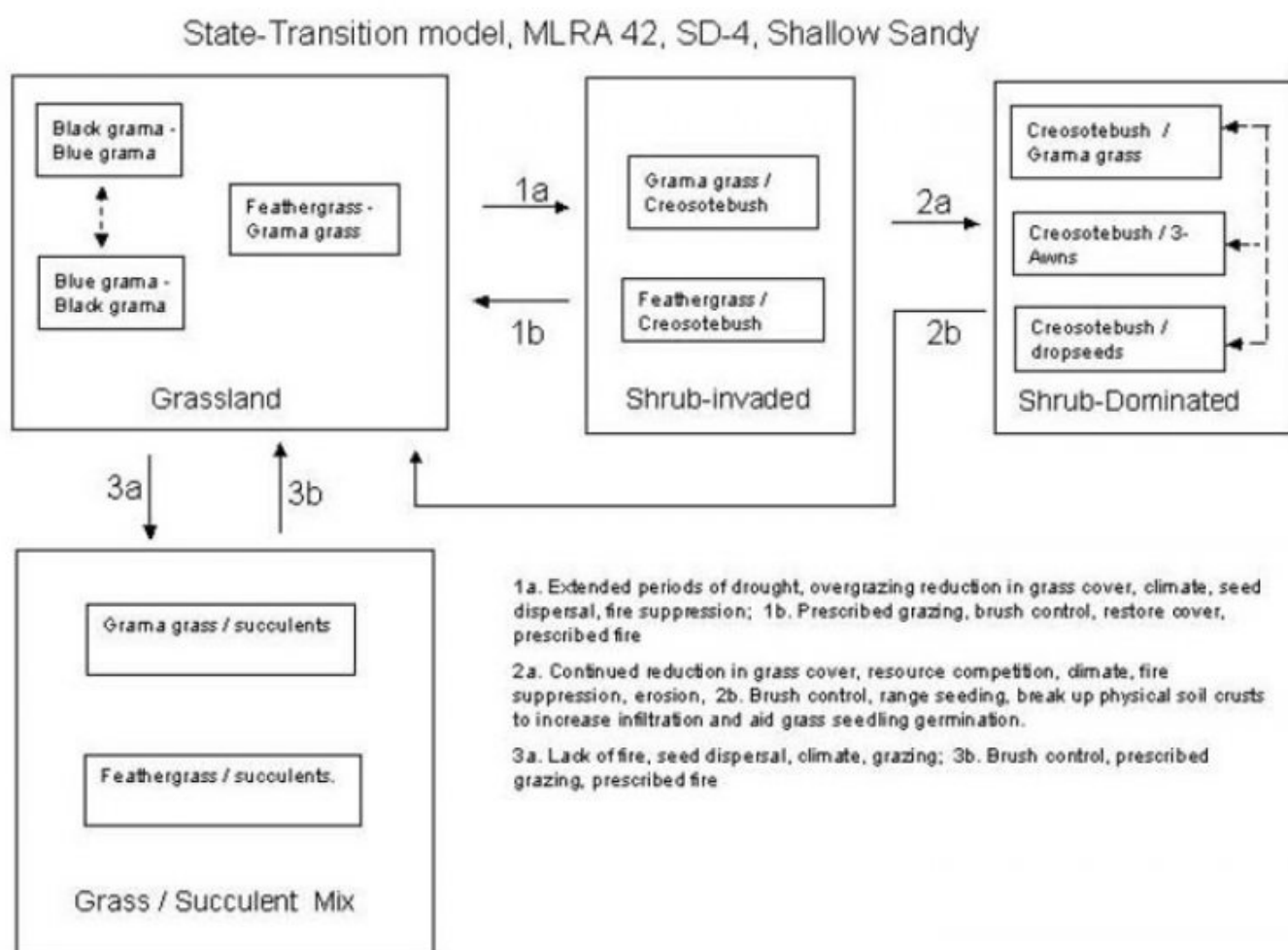


Figure 4. MLRA-42, SD-4, Shallow Sandy

State 1  
Historic Climax Plant Community

Community 1.1  
Historic Climax Plant Community

Grassland: The soils on this site are shallow to a petrocalcic layer, which helps to absorb and keep water perched and available for plants.<sup>3</sup> Black grama and blue grama are the dominant grass species of the historic plant community. New Mexico feathergrass, sand muhly, tobosa, sand dropseed and vine mesquite also occur in significant numbers distributed throughout the site. On Otero Mesa, Fort Bliss Soil Survey, the Shallow Sandy site often occurs in association with the Limy site and the soils appear in a repeating pattern of concave and convex landscapes. New Mexico feathergrass inhabits the convex or high spots on the Jerag soils. When the Shallow Sandy site is adjacent to Limestone Hill sites, feathergrass occurs at higher densities. This increase in feathergrass may in part be due to slight differences in the amount of winter and early spring precipitation received. Dropseeds or threeawns species increase in response to a decrease in grama grass cover. This decrease in cover may be climate or grazing induced. Succulents and shrubs may be favored during years with increased winter precipitation. Succulents and shrubs associated with this state include banana and soap tree yucca, cholla, prickly pear, fourwing saltbush, and winterfat. This site is susceptible to invasion by creosotebush. Diagnosis: Black grama and blue grama are the dominant species. Grass cover is uniformly distributed with few large bare areas. There is little evidence of active rills and gully formation. Litter movement limited to smaller size class litter and short distances. Creosotebush is absent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	785	1237	1491
Forb	72	67	47
Shrub/Vine	40	40	31
Total	897	1344	1569

Figure 6. Plant community growth curve (percent production by month).  
NM5806, R042XD006NM Shallow Sandy HCPC Grassland State.  
R042XD006NM Shallow Sandy Warm Season Grassland - Average rainfall  
year.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	3	8	7	18	28	25	6	2	0

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				471–605	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	471–605	–
2				269–336	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	269–336	–
3				81–108	
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	81–108	–
4				67–81	
	sand muhly	MUAR2	<i>Muhlenbergia arenicola</i>	67–81	–
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	67–81	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	67–81	–
5				54–67	
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	54–67	–
	Hall's panicgrass	PAHA	<i>Panicum hallii</i>	54–67	–
	vine mesquite	PAOB	<i>Panicum obtusum</i>	54–67	–
6				27–40	
	threeawn	ARIST	<i>Aristida</i>	27–40	–
<b>Forb</b>					
7				13–27	
	croton	CROTO	<i>Croton</i>	13–27	–
	bladderpod	LESQU	<i>Lesquerella</i>	13–27	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	13–27	–
8				13–27	
	Forb, annual	2FA	<i>Forb, annual</i>	13–27	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	13–27	–
<b>Shrub/Vine</b>					
10				7–13	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	7–13	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	7–13	–
11				13–27	
	tree cholla	CYIMI	<i>Cylindropuntia imbricata</i> var. <i>imbricata</i>	13–27	–
	yucca	YUCCA	<i>Yucca</i>	13–27	–
	pricklypear	OPUNT	<i>Opuntia</i>	7–13	–

## Animal community

This site is important for many wildlife species. Major species include pronghorn antelope, scaled quail, gambel's quail, coyote, badger and black-tailed jackrabbit. This site provides nesting, hiding and thermal cover for a variety of small rodents, birds, reptiles and their associated predators.

## Hydrological functions

This site normally receives approximately 12-14 inches annual precipitation. Most summer

rainfall occurs as brief sometimes-heavy thunderstorms. Soils are shallow and rated as being in hydrologic group D. Slopes range from 1-5 percent. Permeability is moderately slow above and below the very slowly permeable petrocalcic horizon. The petrocalcic horizon will restrict water movement and retain it in the upper profile for short periods of time. Runoff is very high, and the hazard of water erosion is severe. Available water capacity to the root restricting layer is Very Low to Low.

## Recreational uses

This site offers good potential for antelope and predator hunting, wildlife observation and photography. Scenic beauty of this site will especially appeal to those who value wide open prairie grasslands.

## Wood products

This site has no significant value for wood products.

## Other products

Grazing: This site is suitable for grazing by all kinds and classes of livestock during all seasons of the year. Because of the sandy textures and shallow profile, this site will respond well to management. As the site deteriorates there will be an increase in bare ground leaving the exposed soil susceptible to wind and water erosion. This site responds best to a system of management that rotates the season of use. Initial starting stocking rates will be determined with the landowner or decision-maker. They will be based on past use histories and type and condition of the vegetation. Calculations used to determine initial starting stocking rate will also be based on forage preference ratio

## 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:

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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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