

Ecological site R070BD004NM

Sandy

Accessed: 04/23/2024

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 is on uplands, plains, dunes, fan piedmonts, terraces and in inter dunal areas. The parent material consists of mixed alluvium and or eolian sands or calcareous alluvium derived from sedimentary rock. Slope range on this site range from 0 to 9 percent with the average of 5 percent.

Low stabilized dunes may occur occasionally on this site. Elevations range from 2,800 to 5,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Fan piedmont (3) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	2,842–4,500 ft
Slope	0–5%
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation ranges from 8 to 13 inches. Variations of 5 inches, more or less, are common. Over 80 percent of the precipitation falls from April through October. Most of the summer precipitation comes in the form of high intensity short duration thunderstorms.

Temperatures are characterized by distinct seasonal changes and large annual and diurnal temperature changes. The average annual temperature is 61 degrees with extremes of 25 degrees below zero in the winter to 112 degrees in the summer.

The average frost-free season is 207 to 220 days. The last killing frost is in late March or early April, and the first killing frost is in late October or early November.

Temperature and rainfall both favor warm season perennial plant growth. In years of abundant spring moisture,

annual forbs and cool season grasses can make up an important component of this site. Strong winds blow from the southwest in January through June which rapidly dries out the soil during a critical period for cool season plant growth.

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)	200 days
Freeze-free period (average)	219 days
Precipitation total (average)	12 in

Influencing water features

This site is not influenced from water from wetlands or streams.

Soil features

Soils are moderately deep or very deep. Surface textures are loamy fine sand, fine sandy loam, loamy very fine sand or gravelly sandy loam.

Subsurface is a sandy loam, loam, sandy clay loam, clay loam (contains more than 45 percent sand and 18 to 35 percent clay) and less than 15 percent carbonates.

Substratum is a sandy loam, fine sandy loam, sandy clay loam, clay loam, coarse sandy loam, or coarse sand and Calcium carbonate equivalent of 15 to 40 percent. Some layers high in lime or with caliche fragments may occur at depths of 20 to 30 inches.

These soils, if unprotected by plant cover and organic residue, become wind blown and low hummocks are formed. They contains more than 45 percent sand and 18 to 35 percent clay.

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

Characteristic Soils Are:

Anthony
Berino
Cacique
Harkey
Pajaritio
Reakor
Mobeetie
Wink
Sotim
Vinton
Drake
Onite
Alma
Poquita
Dona Ana
Monahans

Note: *Cacique soils is a shallow soil.

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam (2) Sandy loam (3) Loamy fine sand
Family particle size	(1) Loamy
Drainage class	Well drained to moderately well drained
Permeability class	Moderately rapid to moderately slow
Soil depth	30–72 in
Surface fragment cover <=3"	0–20%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	3–11 in
Calcium carbonate equivalent (0-40in)	5–30%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–1
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–15%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

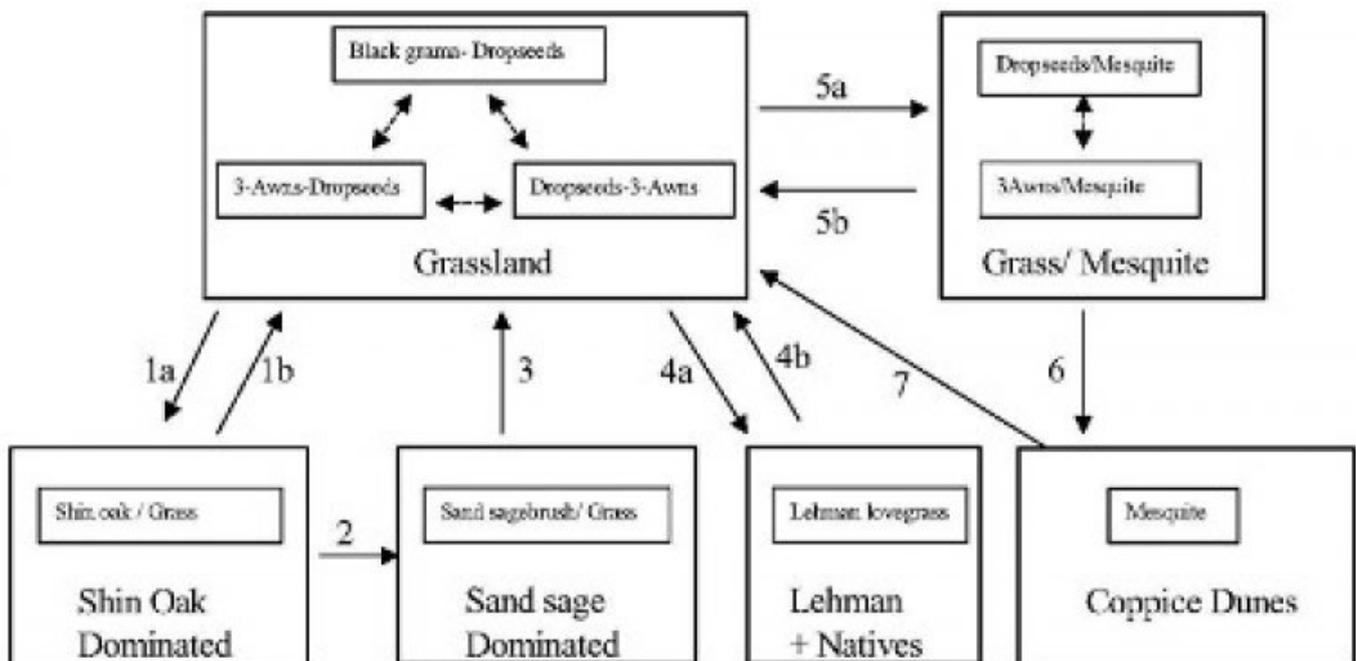
Overview

The Sandy site often intergrades with the Loamy Sand and Deep Sand sites (SD-3). Sandy sites occur on plains, fans, or terraces between drainages. Slopes average less than five percent. Surface textures are usually sandy loams. The historic plant community of the Sandy site is dominated by black grama (*Bouteloua eriopoda*) and dropseeds (*Sporobolus flexuosus*, *S. contractus*, *S. cryptandrus*). Blue grama (*B. gracilis*) also occurs as a subdominant species. Perennial and annual forb abundance is distributed relative to precipitation occurrence. Litter and to a lesser extent, bare ground, compose a significant proportion of the ground cover while grasses compose the remainder. Decreases in black grama and other grass species' cover indicate a transition to states with an increased shrub component. Shinnery oak (*Quercus havardii*), sand sage (*Artemisia filifolia*), and honey mesquite (*Prosopis glandulosa*) can all increase in composition. Lehmann lovegrass (*Eragrostis lehmanniana*) also may occur as a result of invasion and competition among grass species. Heavy grazing intensity and/or drought are influential in decreasing grass cover and subsequently increasing shrub cover. Fire suppression further supports shrub cover increase and an advantage over grass species. However, brush and grazing management may restore grass species and reverse shrub or grass/shrub dominated states back toward the historic plant community.

State and transition model

Plant Communities and Transitional Pathways (diagram)

MLRA-42, SD-3, Sandy



1a. Climate, fire suppression, competition, over grazing

1b. Brush control, Prescribed grazing

2. Brush control (insufficient chemical).

3. Brush control

4a. Invasion from seeded areas.

4b. Brush control reseed native species.

5a. Overgrazing, seed dispersal, lack of fire.

5b. Brush control, prescribed fire.

6. Severe loss of grass cover, wind erosion.

7. Brush control, seeding

State 1

Historic Climax Plant Community

Community 1.1

Historic Climax Plant Community

Grassland: The historic plant community is composed primarily of black grama, dropseeds, and a secondary component of blue grama. Black grama tends to dominate due to the predominance of sandy loam soils; however, dropseeds increase on more loamy soils. Perennial and annual forbs are common but their abundance and

distribution are dependent on seasonal precipitation. Historical fire frequency is unknown but probably contributed to shrub reduction to the competitive advantage of grass species. Excessive grazing and drought are likely the dominant drivers that decrease black grama and increase dropseed and threeawn abundance within the historic plant community. Black grama has low seed viability, and therefore, reproduces vegetatively during the summer growing season. However, black grama growth is delayed one season after normal precipitation. Black grama is dormant for the remainder of the year; however, black grama retains nutritive value yearlong for grazing. In contrast, dropseeds have relatively abundant, viable seed production and can benefit from early spring as well as summer precipitation. Threeawns also respond to spring and summer moisture and tend to be the year's first palatable species. Threeawns and dropseeds, however, are not palatable during dormant periods, which extends grazing pressure to black grama. Moderate to heavy grazing reduces vegetative cover of black grama which increases its susceptibility to wind erosion and drought (Canfield 1939). Black grama is especially vulnerable to grazing during the summer growing season when stoloniferous growth and rooting occur. Black grama sustains short droughts through reduction of plant tufts which will subsequently emerge with sufficient moisture. Prolonged drought or grazing concurrently under drought conditions can delay or impede recovery of black grama (Nelson 1934) and increase abundance of dropseeds, threeawns, and blue grama. Historical fire events may have benefited black grama, especially, frequent, light intensity/severity fires in conjunction with sufficient moisture to increase stolon production (McPherson 1995). Fires which were hot and severe, however, probably contributed to black grama mortality, more so in drought conditions. Diagnosis: This state is a grassland dominated by black grama, dropseeds, and threeawns, with subdominant blue grama. Shrubs, such as sand sage and mesquite, are sparsely dispersed throughout the grassland. Forb populations are present and fluctuate with precipitation variability. Other grasses that could appear on this site include: fall withchgrass, slim tridens, Almejita signalgrass, Indian ricegrass and fluffgrass. Other shrubs include: pale wolfberry, lotebush, tarbush, Apacheplume, and mesquite. Other forbs include: plains tickseed, plains blackfoot, scorpionweed, nama, wooly guara, wooly dalea, spectaclepod mustard, bladderpod mustard, menodora, prickly lettuce, lambsquarter, wooly Indianwheat and wild buckwheat.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	480	720	960
Forb	90	135	180
Shrub/Vine	30	45	60
Total	600	900	1200

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	35-40%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	35-45%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	15-20%

Figure 7. Plant community growth curve (percent production by month). NM2804, R042XC004NM-Sandy-HCPC. SD-3 Sandy - Warm season plant community .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	4	10	10	25	30	12	5	0	0

State 2 Shinnery Oak Dominated

Community 2.1 Shinnery Oak Dominated

Shinnery Oak Dominated: This state is dominated by Shinnery oak with subdominant grass species from the historic plant community. Bare ground is a significant component in this state. Shinnery oak tends to be clumped in distribution in finer soil textures. Shinnery oak density increases (as well as dropseeds, threeawns, and blue grama) in coarse textured (e.g., Loamy Sand sites) and deeper, coarse textured (e.g., Deep Sand and Sandhills sites) soils. Shinnery oak predominates during periods of above average (i.e., 16 in.) precipitation during the months of July and August. Abundance and distribution also increases with disturbance, such as excessive grazing and fire, due to an aggressive rhizome system. Shinnery oak's extensive root system allows competitive exclusion of grasses and forbs. Brush control with herbicide treatments applied in the spring can reduce Shinnery oak (Herbel et al. 1979, Pettit 1986). In addition, repetitive seasons of goat browsing can also decrease Shinnery oak abundance. However, brush management should maintain shrub patches to prevent erosion and to provide wildlife cover and forage. Diagnosis: This state represents a clumped distribution of Shinnery oak with patches of bare ground and subdominant grass species, such as black grama, dropseeds, threeawns, and blue grama. Shinnery oak density increases, as do dropseeds, threeawns, and blue grama, as Sandy site intergrades with Deep Sand and Sandhills sites. Transition to Shinnery Oak-Dominated State (1a): Decrease in black grama with subsequent decrease in dropseeds and threeawns. Increase in Shinnery oak as a result of drought, above average precipitation (>16 inches), grazing, fire suppression, interspecific competition, and coarse textured soils. Key indicators of approach to transition: • Loss of black grama and other grass species cover • Increase of dropseed/threeawn and shinnery oak • Surface soil erosion and bare patch expansion Transition to Historic Plant Community (1b): The Shinnery oak-dominated state begins to transition toward the historic plant community as drivers such as drought, but also above average precipitation (e.g., 16 inches) discontinue. Brush control can also drive the Shinnery oak state toward a grassland state.

State 3 Sand Sage Dominated

Community 3.1 Sand Sage Dominated

Sand Sage Dominated: This state is dominated by sand sage with subdominant grass species from the historic plant community. Sand sage occurs as a result of insufficient herbicide application in Shinnery oak dominated sites with subdominant sand sage. Sand sage either reestablishes dominance or colonizes from an off-site location and stabilizes soils. Sand sage stabilizes light sandy soils from wind erosion and provides a harbor for grass and forb species in heavily grazed conditions (Davis and Bonham 1979). Sand sage abundance increases with drought and/or heavy grazing, but decreases with light grazing due to herbaceous plant competition. Grass and forb species can reestablish as competition from sand sage is relatively light. Herbicide applied in the spring, especially when growth and photosynthesis rates are greatest, can reduce sand sage if there is subsequent rest from grazing (Herbel et al. 1979, Pettit 1986). Brush management should maintain patches of sand sage to prevent wind erosion and subsequent dune formation. Diagnosis: This state is dominated by sand sage with subdominant grass species, such as black grama, dropseeds, threeawns, and blue grama. Sand sage tends to occur in sites with coarser textured soils. Transition to Sand Sage Dominated (2): Sand sage appears from off-site locations and/or increases after insufficient herbicide applications aimed at removing Shinnery oak and sand sage. Key indicators of approach to transition: • Increase of sand sage seedlings and grasses • Reduced soil erosion Transition to Historic Plant Community (3): The sand sage dominated state transitions toward the historic plant community as sand sage decreases primarily through brush management but also with light intensity grazing management. Drought reduction will also support a transition to the historic plant community.

State 4

Lehmann Lovegrass + Natives

Community 4.1

Lehmann Lovegrass + Natives

Lehmann Lovegrass + Natives: This state is dominated by Lehmann lovegrass with subdominant grass species from the historic plant community. Lehmann lovegrass is a warm-season, perennial bunchgrass that was introduced from South Africa in the 1930's for rangeland restoration purposes (Humphrey 1970). Lehmann lovegrass invades from off-site locations with projects utilizing lovegrass for reseeding, soil stabilization, or highway projects. Lehmann lovegrass provides a winter and early spring forage for grazing. Lehmann lovegrass is vigorous in sandy to sandy loam soils which receive approximately 6-8 inches of summer precipitation (Cox et al. 1988). Lehmann lovegrass's aggressive competitive exclusion of native grass species has been attributed to lovegrass's low summer palatability, which reduces vigor of native species and allows lovegrass to increase vigor before grazing. Also, Lehmann lovegrass abundant seed production and establishment, especially after disturbances, allows for increased competition (Cable 1971, Cox et al. 1981). Lehmann lovegrass generally is tolerant to fire because of an aggressive seed-bank; however, severe fires can cause mature lovegrass mortality (Sumrall et al. 1991). Herbicide and reseeding is recommended for control of Lehmann lovegrass (Winn 1991). Diagnosis: Lehmann lovegrass and grass species from the historic plant community, such as black grama, dropseeds, threeawns, and blue grama, dominate this state. Transition to Lehmann lovegrass and native grass species (4a): Decrease in black grama with subsequent decrease in dropseeds and threeawns. Increase in Lehmann lovegrass as a result of drought, grazing, fire and interspecific competition from nearby sources of Lehmann lovegrass. Key indicators of approach to transition: • Loss of black grama and other grass species cover • Disturbance and nearby source of Lehmann lovegrass • Increase of Lehmann lovegrass seedlings Transition to Historic Plant Community (4b): The Lehmann lovegrass/native grass state transitions toward the historic plant community after actions such as herbicide application and native reseeding have occurred. In addition, prevention of disturbances such as fire and livestock grazing also will encourage the transition to a native grass community

State 5

Grass/Mesquite

Community 5.1

Grass/Mesquite

Grass/Mesquite: This state is dominated by honey mesquite with dropseeds and/or threeawns. Black grama generally is rare as a result of heavy grazing intensity. Honey mesquite invades through seed dispersal from grazing livestock and/or wildlife. Dropseeds and threeawns cohabitate with mesquite due to sufficient precipitation. Mesquite tends to be arborescent due to less soil erosion relative to the Coppice Dunes state which reflects large soil loss. Mesquite obtains approximately half of its nitrogen from symbiotic bacteria housed in root nodules (Lajtha and Schlesinger 1986). Mesquite also provides nitrogen and soil organic matter to co-dominant grasses (Ansley and Jacoby 1998, Ansley et al. 1998). Historical fire occurrences reduced mesquite abundance by disrupting seed production cycles and suppressing seedlings; thus, grass species remained dominant. However, fire suppression has allowed mesquite to increase in density and abundance, increasing mesquite resistance to fires through aggressive resprouting. Herbicide application combined with subsequent prescribed fire may be effective in mesquite reduction (Britton and Wright 1971). Diagnosis: This state is co-dominated by honey mesquite and dropseeds or threeawns. Transition to Grass/Mesquite State (5a): This state occurs due to a decrease in black grama primarily from heavy grazing intensity and from an introduction of mesquite seeds from grazers. Dropseeds and threeawns increase and co-exist in the absence of black grama. Fire suppression also is responsible for an increase in mesquite. Key indicators of approach to transition: • Loss of black grama • Increase of dropseeds and/or threeawns • Increase of mesquite seedlings Transition to Historic Plant Community (5b): Transition to the historic plant community requires brush management though herbicide application and possibly prescribed fire to reduce mesquite abundance. Once shrub species are removed, prescribed fire may be useful in maintaining a dominant grassland. Precipitation is also necessary in conjunction with management activities to support a dominant grassland.

State 6

Coppice Dunes

Community 6.1 Coppice Dunes

Coppice Dunes: This state is dominated by coppice mesquite dunes with minimal or no grass cover. Honey mesquite occurs in a multi-stemmed growth form which cultivates its dune formation by entrapping drifting sands. Mesquite utilizes its extensive tap and lateral roots to benefit from moisture deep in coarse textured soils. Grass species cannot compete for moisture, especially with compounding perturbations such as heavy grazing and drought. Soils succumb to wind erosion with the depletion of grass cover and eventually dunes form around mesquite plants (Gould 1982). Brush management is limited to herbicide application, biological control, or manual removal, as a lack of grass cover prevents prescribed burning. Seeding subsequent to brush control may transition this State toward the historic plant community. Diagnosis: This state is characterized by low growing, multi-stemmed mesquite plants which form Coppice dunes by drifting soils from wind erosion. As grass cover decreases, windblown soils are removed from unprotected, inter-dune areas. Soils are then re-deposited on dunes which increases dune size. Transition to Mesquite Coppice Dunes State (6): Decrease in black grama with subsequent decrease in dropseeds and threeawns due to competition with mesquite especially during drought, heavy grazing, and fire suppression. Competitive exclusion of grasses leads to wind erosion of sandy soils and dune formation of low growing mesquite plants. Key indicators of approach to transition: • Loss of black grama and other grass species cover • Wind erosion as evidenced by pedestalled plants • Bare patch expansion • Increase of Coppice dune mesquites Transition to Historic Plant Community (7): Transition toward the historic plant community requires mesquite removal though either herbicide application, biological control, or manual removal. In addition, seeding of native grass species with subsequent years of sufficient moisture is critical.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Warm Season			315–360	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	315–360	–
2	Warm Season			45–90	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	45–90	–
3	Warm Season			27–45	
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	27–45	–
4	Warm Season			90–135	
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	90–135	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	90–135	–
	mesa dropseed	SPFL2	<i>Sporobolus flexuosus</i>	90–135	–
5	Warm Season			27–45	
	threeawn	ARIST	<i>Aristida</i>	27–45	–
6	Warm Season			27–45	
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	27–45	–
7	Warm Season			27–45	
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	27–45	–
8	Warm Season			45–72	
	silver bluestem	BOSA	<i>Bothriochloa saccharoides</i>	45–72	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	45–72	–
9	Warm Season			9–27	
	vine mesquite	PAOB	<i>Panicum obtusum</i>	9–27	–

10	Warm Season			9–27	
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	9–27	–
11	Other Perennial Grasses			9–27	
	Grass, perennial	2GP	<i>Grass, perennial</i>	9–27	–
Shrub/Vine					
12	Shrub			9–45	
	yucca	YUCCA	<i>Yucca</i>	9–45	–
13	Shrub			9–27	
	catclaw mimosa	MIACB	<i>Mimosa aculeaticarpa var. biuncifera</i>	9–27	–
14	Shrub			9–27	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	9–27	–
15	Shrub			9–27	
	jointfir	EPHED	<i>Ephedra</i>	9–27	–
16	Shrub			9–27	
	javelina bush	COER5	<i>Condalia ericoides</i>	9–27	–
17	Shrub			9–27	
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	9–27	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	9–27	–
18	Other Shrubs			9–27	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	9–27	–
Forb					
19	Forb			27–63	
	croton	CROTO	<i>Croton</i>	27–63	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	27–63	–
20	Forb			27–45	
	curlycup gumweed	GRSQ	<i>Grindelia squarrosa</i>	27–45	–
	woolly groundsel	PACA15	<i>Packera cana</i>	27–45	–
21	Forb			9–27	
	Adonis blazingstar	MEMU3	<i>Mentzelia multiflora</i>	9–27	–
22	Forb			27–45	
	redstem stork's bill	ERIC6	<i>Erodium cicutarium</i>	27–45	–
	Texas stork's bill	ERTE13	<i>Erodium texanum</i>	27–45	–
23	Other Forbs			9–27	
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	9–27	–

Animal community

This site provides habitat which support a resident animal community that is characterized by pronghorn antelope, black-tailed jackrabbit, spotted ground squirrel, black-tailed prairie dog, yellow-faced pocket gopher, Ord's kangaroo rat, Northern grasshopper mouse, southern plains woodrat, badger, meadowlark, roadrunner, burrowing owl, white-necked raven, cactus wren, pyrrhuloxia, lesser prairie chicken, mourning dove, scaled quail, Harris' hawk, side-blotched lizard, marbled whiptail, Texas horned lizard, prairie rattlesnake, plains spadefoot toad, and ornate box turtle.

Hydrological functions

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

Hydrologic Interpretations

Soil Series Hydrologic Group

Anthony B

Berino B

Cacique C *shallow soil

Harkey B

Pajaritio B

Reakor B

Mobeetie B

Wink B

Sotim B

Vinton B

Drake B

Onite B

Alma B

Poquita B

Dona Ana B

Monahans B

Recreational uses

This site offers recreation potential for hiking, horseback riding, nature observation, and photography, bird, antelope and predator hunting. During years of abundant spring moisture, this site displays a colorful array of wildflowers.

Wood products

This site has no potential for wood products.

Other products

This site is suitable for grazing by all classes and kinds of livestock during all seasons of the year. Under retrogression, plants such as black grama, blue grama, bush muhly, plains bristlegrass, Arizona cottontop, vine mesquite, little bluestem and fourwing saltbush will decrease while the dropseeds, threeawns, tobosa, yucca, catclaw mimosa, javelinabush, mesquite and broom snakeweed will increase. This site responds well to brush management and deferment. It is best suited to a system of management that rotates the season of use.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index Ac/AUM

100 - 76 2.7 - 3.8

75 - 51 3.5 - 5.0

50 - 26 5.0 - 8.0

25 - 0 8.1 +

Inventory data 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 Areas of New Mexico. This site has been mapped and correlated with soils in the following soil surveys. Eddy County, Lea County, and Chaves County.

Other references

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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:**
