

Ecological site R070BC022NM Sandhills

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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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on plains. The soils are calcareous sandy eolian deposits derived from sedimentary rock. Land form of sand dunes or hillslopes. Slopes average 5 to 35 percent. Slopes are complex as the steeper slopes are shorter in length while the more gentle slopes are longer in length. Direction of slopes vary and is usually not significant. Elevations range from 2,842 to 4,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Hill (3) Dune
Flooding frequency	None
Ponding frequency	None
Elevation	870 – 1,370 m
Slope	10 – 40 %
Aspect	Aspect is not a significant factor

Climatic features

The climate of the area is “semi-arid continental”. 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 180 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. Because of the texture of this soil, most rainfall is effective. Strong winds blow from the west and southwest from January through June which accelerates soil drying at a time 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)	220 days
Freeze-free period (average)	240 days
Precipitation total (average)	330 mm

Influencing water features

This site is not influenced by wetlands or streams.

Soil features

The soils of this site are deep and very deep. Surface textures are fine sand or loamy fine sand. Subsoils is a fine sand or loamy fine sand to a depth of 60 inches or more. These soils have less than 10 percent clay content. These soils are subject to severe wind erosion if vegetative cover is not adequate.

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

Characteristic Soils Are:

Kermi
Aguena

Table 4. Representative soil features

Surface texture	(1) Fine sand (2) Loamy fine sand (3) Loamy sand
Family particle size	(1) Sandy
Drainage class	Well drained to excessively drained
Permeability class	Rapid to very rapid

Soil depth	150 – 180 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	7.62 – 22.86 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

Overview:

The Sandhills site occurs adjacent to or intergrades with the Deep Sand site. The Sandhills site is differentiated from deep sand sites by a steeper average slope, and an increased depth to a soil texture change. Sandhills slopes are usually greater than eight percent, and the soil profile is a fine sand or loamy fine sand to a depth greater than 60 inches. Deep Sand sites have slopes less than eight percent and a textural change can occur at less than 60 inches. The historic plant community of the Sandhills site is a mixture of grasses, shrubs and forbs, with tall grasses dominating in aspect. During years of abundant spring moisture, tall growing forbs occasionally reach aspect dominance. Sand bluestem and giant dropseed are the dominant grasses, with Havard panicum and dropseeds as sub-dominants. Sand shinnery oak and soapweed yucca are the dominant shrubs. Drought favors shinnery by impacting grasses more severely. Shinnery oak's ability to store water and carbohydrates, and its strong negative leaf water potential enable it to out compete grasses during drought conditions. Changes in historical fire regimes, competition by shrubs, and overgrazing may contribute to this site becoming dominated by sand shinnery oak.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1				219-328	
	sand bluestem	ANHA	<i>Andropogon hallii</i>	219-328	–
	Havard's panicgrass	PAHA2	<i>Panicum havardii</i>	219-328	–
	giant dropseed	SPGI	<i>Sporobolus giganteus</i>	219-328	–
2				164-219	
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	164-219	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	164-219	–
	mesa dropseed	SPFL2	<i>Sporobolus flexuosus</i>	164-219	–
3				55-110	
	thin paspalum	PASE5	<i>Paspalum setaceum</i>	55-110	–
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	55-110	–
4				33-55	
	threeawn	ARIST	<i>Aristida</i>	33-55	–
	mat sandbur	CELO3	<i>Cenchrus longispinus</i>	33-55	–
	flatsedge	CYPER	<i>Cyperus</i>	33-55	–
5				33-55	
	Grass, perennial	2GP	<i>Grass, perennial</i>	33-55	–
Shrub/Vine					
6				55-110	
	Havard oak	QUHA3	<i>Quercus havardii</i>	55-110	–
7				55-110	
	soapweed yucca	YUGL	<i>Yucca glauca</i>	55-110	–
8				33-55	
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	33-55	–
9				22-55	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	22-55	–
10				22-55	
	rabbitbrush	CHRY9	<i>Chrysothamnus</i>	22-55	–
11				22-55	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	22-55	–
Forb					
12				22-55	
	featherplume	DAFO	<i>Dalea formosa</i>	22-55	–
13				33-55	
	sundrops	CALYL	<i>Calylophus</i>	33-55	–
	phlox heliotrope	HECO5	<i>Heliotropium convolvulaceum</i>	33-55	–
	sharpleaf penstemon	PEAC	<i>Penstemon acuminatus</i>	33-55	–
14				22-55	
	touristplant	DIWI2	<i>Dimorphocarpa wislizeni</i>	22-55	–
	lemon beebalm	MOCI	<i>Monarda citriodora</i>	22-55	–

16				33-55	
	hymenopappus	HYMEN4	<i>Hymenopappus</i>	33-55	–
	blazingstar	MENTZ	<i>Mentzelia</i>	33-55	–
	threadleaf ragwort	SEFLF	<i>Senecio flaccidus var. flaccidus</i>	33-55	–
17				22-55	
	sunflower	HELIA3	<i>Helianthus</i>	22-55	–
18				22-55	
	buckwheat	ERIOG	<i>Eriogonum</i>	22-55	–
19				22-55	
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	22-55	–

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Animal community

This site provides habitat which support a resident animal community that is characterized by pronghorn antelope, black-tailed jackrabbit, Ord's kangaroo rat, Northern grasshopper mouse, Southern Plains woodrat, swift fox, roadrunner, meadowlark, lark bunting, ferruginous hawk, lesser prairie chicken, mourning dove, scaled quail, sand dune lizard, marbled whiptail, ornate box turtle, bullsnake and Western diamondback rattlesnake. Grasshopper and vesper sparrows utilize the site during migration. The ferruginous hawk sometimes nests on dunes associated with the site. White-tailed deer are also sometimes associated with this site (Mescalero Sands). Where mesquite invades, resident species of birds such as white-necked raven, roadrunner, pyrrhuloxia, mourning dove, and Harris hawk nest. Where sand hummocks form around shrubs, rodent populations and their predators increase. Fourwing saltbush, shinnery oak, sand sagebrush, and mesquite provide protective cover for scaled quail. Seed, green herbage, and fruit from a variety of grasses, forbs, and shrubs provide food for a number of birds and mammals, including mourning dove, scaled quail, lesser prairie chicken and antelope.

Hydrological functions

The runoff curve numbers are determined by field investigations using hydrolic cover conditions and hydrologic soil groups. Hydrologic Interpretations Soil Series----- Hydrologic Group Kermit----- A Aguena----- A

Recreational uses

This site offers recreation potential for hiking, horseback riding, nature observation and photography. This site also offers opportunities for hunting of such species as quail, dove and antelope. Mechanical, off-road vehicle use by dune buggies, four wheelers, or motor bikes is site-destructive, resulting in severe soil movement by wind erosion. Off-road vehicle use should be confined to those areas which are already deteriorated and where intensive management for soil protection can be practiced. During years of abundant spring moisture, this site displays a colorful array of wildflowers during May and June. A few showy summer and fall flowers also occur.

Wood products

The plant community associated with this site affords little or no wood products.

Other products

This site is suitable for grazing during all seasons of the year by all kinds and classes of livestock. Where shinnery oak has increased considerably above the amount in the potential plant community cattle loss can occur if grazed during the late bud and early leaf stage. This site responds well to an integrated brush management and grazing management. Brush management is inappropriate in occupied or potential habitat for sand dune lizard. Mismannagement of this site will cause a decrease in Harvard panicum, sand bluestem, giant dropseed, plains bristlegrass, sand paspalum and fourwing saltbush. There will be a corresponding increase in dropseeds, sand sagebrush and shinnery oak. When shinnery oak is not a problem, this site responds best to a system of mangement that rotates the season of use. Grazing management plans should be design to leave adequate residual cover for lesser prairie chicken nesting.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month Similarity Index----- Ac/AUM 100 - 76----- 2.0 – 4.0 75 – 51----- 3.0 – 6.5 50 – 26----- 5.0 – 12.0 25 – 0----- 12.0 - +

Inventory data references

Data collection for this site was done in conjunction with the progressive soil surveys within the Southern Desertic Basins, Plains and Mountains (SD-3) Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: South Chaves, Eddy, Lea and Otero Counties.

Other references

Literature Cited:

1. Sears, W.E., C.M. Britton, D.B. Wester, and R.D. Pettit. 1986. Herbicide conversion of a sand shinnery oak (*Quercus havardii*) community: effects on biomass. *J. Range. Manage.* 39: 399-403.
2. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2002, September). Fire Effects Information System, [Online]. Available: <http://www.fs.fed.us/database/feis/> [accessed 1/07/02].
3. Villena, F. and J.A. Pfister. 1990. Sand shinnery oak as forage for Angora and Spanish goats. *J. Range. Manage.* 43: 116-122.

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:
