USDA Natural Resources
Conservation Service

Ecological site R077BY028NM
Sandy Plains

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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.

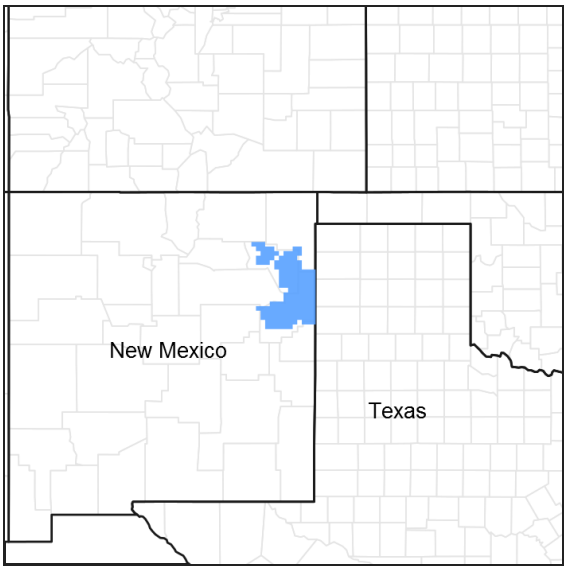

Figure 1. Mapped extent

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.

Classification relationships

Characteristic Soils Are:
Amarillo, Arch, Brownfield, Clovis, Drake
Gomez, Mansker, Springer

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on level to gently undulating sloping eolian and alluvial sediments on the uplands. Characteristically, the landscape is hummocky. Elevation ranges from 3,600 to 4,800 feet above sea level. Slope ranges from 0 to 9 percent. Exposure varies and is not significant.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Sand sheet
Elevation	3,600–4,800 ft
Slope	0–9%
Aspect	Aspect is not a significant factor

Climatic features

The climate of this area can be classified as “semi-arid continental”.

Precipitation averages from about 15 to 16 inches annually with approximately 75 percent of this yearly moisture falling during the period of May through October. Most summer rainfall is associated with usually brief afternoon and evening thundershowers, which occasionally produce heavy rain over a small area, and sometimes bring a little hail. Winters are generally dry, with only one or two days a month when as much as one-tenth inch of moisture falls. However, winter average 20 inches of snow, although most snowfalls are light with an occasional storm producing up to six inches. Following these storms, snow may lie on the ground for several days and occasionally moderate to strong winds accompanying these storms result in blizzard conditions and heavy drifting. Although the precipitation patterns favor the production of warm-season plants, sufficient moisture is received in the late winter and the spring to support cool-season plants. Approximately 25 percent of the annual precipitation is received during April and May. May is generally the wettest month followed by July and then August.

Temperatures show the seasonal changes and large annual and diurnal ranges characteristic of such a climate. Summers are generally mild. The high daily temperature reading exceed 90 degrees F about one-third of the time, and readings of 100 degrees F occur about once a year. Rapid cooling after sundown results in minimum temperatures below 60 degrees F on most nights, even in midsummer. Winter shade temperatures usually rise to the mid-40’s and an average of only 15 days fail to see temperatures rise above the freezing mark most of the time from early November through March; below zero readings occur on an average of only three times a year.

The freeze-free season ranges from 168 days to 171 days between April 28th to October 16th. Both temperatures and annual precipitation favor warm-season plants. About 40 percent of the annual precipitation is received during the season where temperatures will benefit cool-season plants and only 10 percent falls during the dormant season.

While open to winter invasions of arctic air over the Great Plains, this area is far enough south and west to miss many of these outbreaks. Mountains to the north and west intercept mush of the precipitation from the Pacific northwest storms coming through this area during the winter. An average hourly wind velocity for the year is 15 miles per hour. Somewhat higher winds prevail during the spring months, but velocities exceeding 24 mile per hour are experienced only 10 percent of the usual year. Stronger winds blow chiefly from a westerly or southwesterly direction during the spring. Relative humidity is moderately low.

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)	191 days
Freeze-free period (average)	220 days
Precipitation total (average)	16 in

Influencing water features

Soil features

The soils of this site are deep and well drained. The surface textures are fine sandy or loamy fine sand from 10 to 36 inches thick. The textures of the argillic subsoil are sandy clay loam, fine sandy loam or loamy fine sand. In some

soils, a calcic horizon occurs at a depth of 20 to 40 inches. The soils have moderately rapid or moderate permeability. The available water-holding capacity is moderate to high. The plant-soil-air-water relationship is good. Because of the coarse surface textures, the soils, if unprotected by plant cover and organic residue, becomes wind blown and low hummocks or dunes are formed around shrubs.

Table 4. Representative soil features

Surface texture	(1) Loamy fine sand (2) Fine sand
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	40–72 in
Available water capacity (0-40in)	6–12 in
Electrical conductivity (0-40in)	0–4 mmhos/cm
Soil reaction (1:1 water) (0-40in)	6.1–9
Subsurface fragment volume <=3" (Depth not specified)	15–35%

Ecological dynamics

State and transition model

Ecosystem states

1. Historic Climax Plant Community

State 1 submodel, plant communities

1.1. Historic Climax Plant Community

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

This site is a grassland dominated by warm-season, tall and mid-grasses. Cool-season bunchgrasses, shrubs and half-shrubs, and forbs occupy approximately 40 to 45 percent of the plant community and are evenly distributed. The forb composition fluctuates from year to year depending upon moisture conditions.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1050	1575	2100
Shrub/Vine	225	338	450
Forb	225	338	450
Total	**1500**	**2251**	**3000**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	15%
Grass/grasslike foliar cover	30%
Forb foliar cover	2-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	25%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	30%

Figure 5. Plant community growth curve (percent production by month). NM4728, R077BY028NM Sandy Plains Reference State. R077BY028NM Sandy Plains Reference State.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	3	3	5	5	25	30	15	10	2	0

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	**Sand bluestem**			405–450	
	sand bluestem	ANHA	*Andropogon hallii*	405–450	–
2	**Little bluestem**			225–270	
	little bluestem	SCSC	*Schizachyrium scoparium*	225–270	–
3	**Sand spike dropseed**			158–225	
	spike dropseed	SPCO4	*Sporobolus contractus*	158–225	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	158–225	–
4	**NM feathergrass**			135–180	
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	135–180	–
5	**Needleandthread**			68–113	
	needle and thread	HECO26	*Hesperostipa comata*	68–113	–
6	**Hairy grama**			68–113	
	hairy grama	BOHI2	*Bouteloua hirsuta*	68–113	–

7	**threeawn spp.**			68–113	
	threeawn	ARIST	*Aristida*	68–113	–
8	**Sideoats grama**			68–113	
	sideoats grama	BOCU	*Bouteloua curtipendula*	68–113	–
9	**Black grama**			68–113	
	black grama	BOER4	*Bouteloua eriopoda*	68–113	–
10	**sand paspalum fall witchgrass red lovegrass plains**			68–113	
	fall witchgrass	DICO6	*Digitaria cognata*	68–113	–
	red lovegrass	ERSE	*Eragrostis secundiflora*	68–113	–
	thin paspalum	PASE5	*Paspalum setaceum*	68–113	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	68–113	–
11	**Indiangrass Switchgrass**			68–113	
	switchgrass	PAVI2	*Panicum virgatum*	68–113	–
	Indiangrass	SONU2	*Sorghastrum nutans*	68–113	–
12	**Indian Ricegrass**			23–68	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	23–68	–
13	**Annual grasses Sedges**			0–45	
	Grass, annual	2GA	*Grass, annual*	0–45	–
	sedge	CAREX	*Carex*	0–45	–
Forb					
14	**Queensdelight globemallow annual buckwheat sunflo**			68–113	
	annual buckwheat	ERAN4	*Eriogonum annuum*	68–113	–
	common sunflower	HEAN3	*Helianthus annuus*	68–113	–
	globemallow	SPHAE	*Sphaeralcea*	68–113	–
	queen's-delight	STSY	*Stillingia sylvatica*	68–113	–
15	**Annual forbs**			45–90	
	Forb, annual	2FA	*Forb, annual*	45–90	–
16	**Perennial forbs**			45–90	
	Forb, perennial	2FP	*Forb, perennial*	45–90	–
17	**Westerragweed stickleaf wooly beeblossom mustard d**			0–68	
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–68	–
	mustard	BRASS2	*Brassica*	0–68	–
	prairie clover	DALEA	*Dalea*	0–68	–
	Adonis blazingstar	MEMU3	*Mentzelia multiflora*	0–68	–
Shrub/Vine					
18	**Sand sagebrush**			113–158	
	sand sagebrush	ARFI2	*Artemisia filifolia*	113–158	–
19	**Small soapweed**			68–113	
	soapweed yucca	YUGL	*Yucca glauca*	68–113	–
20	**plains rabbitbrush**			23–68	
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	23–68	–
21	**Sand plum**			23–68	
	Watson's plum	PRANW	*Prunus angustifolia var. watsonii*	23–68	–
22	**Skunkbush sumac**			23–68	

	skunkbush sumac	RHTR	*Rhus trilobata*	23–68	–
23	**Groundsel**			23–45	
	ragwort	SENEC	*Senecio*	23–45	–
24	**Prickly pear mormon tea**			0–45	
	mormon tea	EPVI	*Ephedra viridis*	0–45	–
	plains pricklypear	OPPO	*Opuntia polyacantha*	0–45	–

Animal community

Habitat for Wildlife:
No Data

Hydrological functions

Soil Series----Hydrologic Group
Amarillo-------B
Arch-----------B
Brownfield------A
Clovis---------B
Drake----------B
Gomez----------B
Mansker--------B
Springer-------A, B

Recreational uses

Recreation potential is limited due to the lack of access roads for two-wheel drive vehicles, lack of live water and the lack of shade. The terrain typical of the “wide open spaces” of the area enhances aesthetic appeal. Hunting for upland game birds and antelope is fair. The natural beauty is enhanced by the variety of flowering plants that bloom from early spring to fall and the varying color hues of vegetation as it matures.

Wood products

This site produces no wood products.

Other products

Grazing:
This site can be grazed any season of the year by all classes of livestock, generally without regard to age. However, cattle most efficiently utilize it. The variety of grasses, forbs and half-shrubs furnishes good nutrition to grazing animals during most seasons of the year. Approximately 90 percent of the annual production furnish forage for grazing animals. Continuous grazing or grazing continually during the period from April to October by cattle will result in a plant community dominated by low forage value species such as sand dropseed, sand sagebrush, yucca and threeawn spp. Sand sagebrush and yucca may increase to the extent that they are the dominant vegetation. A system of deferred grazing, which varies the season of grazing and rest, is needed to maintain or to improve a healthy well-balanced plant community. Rest in different seasons benefits different plants. Winter rest will benefit all woody species. Spring rest (April-June) encourages forb production and will benefit New Mexico feathergrass, Indian ricegrass and needleandthread. Summer rest (July-September) benefits warm-season grasses such as sand bluestem, sideoats grama and little bluestem to grow and reproduce. Fall rest allows plants to complete their growth cycle. New Mexico feathergrass and needleandthread are utilized readily by cattle in the spring and fall and least utilized in the summer when the awns interfere with utilization and may injure cattle. Although utilization in June is detrimental to stands of needleandthread and New Mexico feathergrass, a quick, moderate cropping when the heads are in the boot state of development can remove the heads and prevent subsequent interference and injury to cattle by awns. For this purpose, the timing and degree of use must be determined on limited areas, preferably when soil moisture is adequate for regrowth, and should be followed by a period of deferment. Sand sagebrush can be controlled by concentrating cattle during the late winter and early spring followed by deferment until October.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month
Similarity Index---Ac/AUM
100 - 76----------1.8 – 3.0
75 – 51----------2.3 – 4.3
50 – 26----------3.0 – 8.6
25 – 0----------8.6+

Type locality

Location 1: Quay County, NM
Location 2: Harding County, NM
Location 3: Curry County, NM

Other references

Data collection for this site was done in conjunction with the progressive soil surveys within the Southern High Plains 77 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Curry, Harding, & Quay.

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:**

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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):**

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:**