USDA Natural Resources Conservation Service

Ecological site DX035X03E007
Deep Sand

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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.

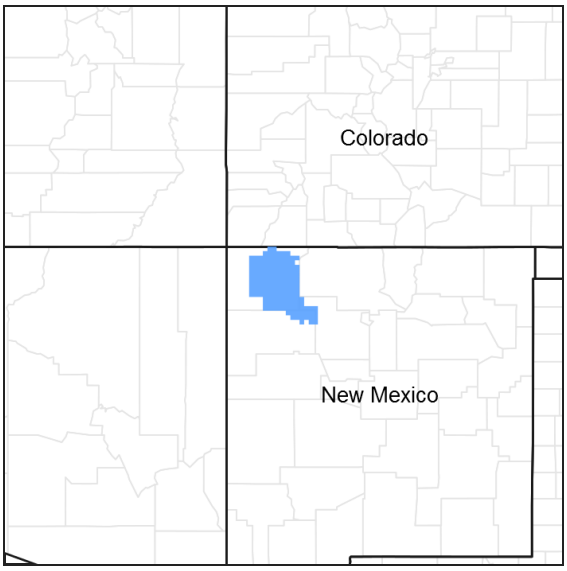

Figure 1. Mapped extent

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

Legacy ID

R035XB007NM

Physiographic features

This upland site occurs on plateaus, mesas, and upland valley side slopes. It occupies sandy ridges, side slopes, and alluvial fans. Dunes and hummocks are common. The slopes are generally from 0 to 8 percent; however, the Sheppard loamy fine sand may be as steep as 60 percent. Elevations range from 5,000 to 6,400 feet above sea level. All exposures are involved, with no major difference in vegetation due to exposure.

Table 2. Representative physiographic features

Landforms	(1) Mesa (2) Valley side (3) Dune
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	None to rare
Elevation	1,524–1,951 m
Slope	0–60%
Water table depth	61–183 cm
Aspect	Aspect is not a significant factor

Climatic features

This site has an arid, mild, dry climate with distinct seasonal temperature variations and large annual and diurnal temperature changes.

Mean annual precipitation varies from 7 to 10 inches. Deviations of 4 inches or more are quite common. Distribution is 65% during the native-plant growth period, which is from April through September. May and June are the dry months. During July, August, and September, 3.5 inches of precipitation influences the presence and production of warm-season plants. Late-fall and winter moisture is conducive to the production of cool-season plants, which usually begin growth in March and end with plant maturity and seed dissemination. This usually takes place in the early part of June when the moisture deficiency and warmer temperatures occur. The Gulf of Mexico is the principal source of moisture for summer precipitation, which is characterized by brief afternoon thunderstorms. Winter moisture occurs as light rain or snow.

Temperatures vary from a monthly mean of 75 degrees F in July to 27 degrees F in January, and from an annual maximum of 106 degrees F to an annual minimum of -35 degrees F. The average last killing frost in the spring is May 8, and the average first killing frost in the fall is October 10. The frost-free season is approximately 160 days. Temperatures are conducive for native grass and forb growth from April through September. Maximum shrub growth occurs in the spring months.

The wind blows most frequently from an easterly direction; however, a majority of the stronger winds (10 to 25 miles per hour) are from a westerly quadrant. Spring is the windiest season. Average hourly wind velocities are near 6 miles per hour. Spring and summer 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 and often results in structural damage to native plants, especially young seedlings.

Climate data were 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)	151 days
Freeze-free period (average)	177 days
Precipitation total (average)	254 mm

Influencing water features

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

Soil features

The soils on this site are deep, well- to somewhat excessively drained, and have light-colored loamy sand and loamy fine sand surfaces ranging from 5 to 10 inches thick. The underlying layers are coarse- and moderately

coarse-textured.

These soils formed in material weathered from sandstone. Water intake rate is rapid. Permeability is moderately rapid to rapid. Roots penetrate easily. Available water-holding capacity ranges from 2.5 to 6 inches in a 5-foot profile.

Table 4. Representative soil features

Surface texture	(1) Gravelly loamy fine sand (2) Loamy sand
Family particle size	(1) Loamy
Drainage class	Well drained to excessively drained
Permeability class	Moderately slow to rapid
Soil depth	152–183 cm
Surface fragment cover <=3"	35–60%
Available water capacity (0-101.6cm)	0–15.24 cm
Electrical conductivity (0-101.6cm)	0–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	60%

Ecological dynamics

The vegetative aspect of this site is a shrub/grass mixture characterized by short- and mid-grasses; mid-grasses are prominent. Shrubs and perennial forbs compose 30 to 40% of the composition of the total vegetation. Annual forbs and grasses occur in relative abundance during spring and summer months in years of above average plant growing conditions.

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

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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	370	538
Forb	50	93	135
Total	**252**	**463**	**673**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	15%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	50%

Figure 5. Plant community growth curve (percent production by month). NM0907, R035XB007NM-Deep Sand-HCPC. A shrub/grassland characterized by short/mid-grasses with a major perennial forb component. .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	7	10	10	25	30	10	3	0	0

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				155–185	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	155–185	–
2				19–31	
	James' galleta	PLJA	*Pleuraphis jamesii*	19–31	–
3				31–62	
	blue grama	BOGR2	*Bouteloua gracilis*	31–62	

	blue grama	BOGR2	*Bouteloua gracilis*	31–62	–
4				62–93	
	spike dropseed	SPCO4	*Sporobolus contractus*	62–93	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	62–93	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	62–93	–
	giant dropseed	SPGI	*Sporobolus giganteus*	62–93	–
5				19–31	
	sandhill muhly	MUPU2	*Muhlenbergia pungens*	19–31	–
6				31–62	
	needle and thread	HECO26	*Hesperostipa comata*	31–62	–
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	31–62	–
7				19–31	
	squirreltail	ELEL5	*Elymus elymoides*	19–31	–
8				31–62	
	alkali sacaton	SPAI	*Sporobolus airoides*	31–62	–
Forb					
9				19–31	
	locoweed	OXYTR	*Oxytropis*	19–31	–
	beardtongue	PENST	*Penstemon*	19–31	–
	ragwort	SENEC	*Senecio*	19–31	–
	globemallow	SPHAE	*Sphaeralcea*	19–31	–
Shrub/Vine					
10				62–93	
	mormon tea	EPVI	*Ephedra viridis*	62–93	–
11				62–93	
	fourwing saltbush	ATCA2	*Atriplex canescens*	62–93	–
12				31–62	
	sand sagebrush	ARFI2	*Artemisia filifolia*	31–62	–
13				19–31	
	rabbitbrush	CHRYS9	*Chrysothamnus*	19–31	–
14				19–31	
	winterfat	KRLA2	*Krascheninnikovia lanata*	19–31	–
15				31–62	
	big sagebrush	ARTR2	*Artemisia tridentata*	31–62	–
16				19–31	
	black sagebrush	ARNO4	*Artemisia nova*	19–31	–
	Mexican cliffrose	PUME	*Purshia mexicana*	19–31	–
17				19–31	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	19–31	–
18				19–31	
	plains pricklypear	OPPO	*Opuntia polyacantha*	19–31	–
	soaptree yucca	YUEL	*Yucca elata*	19–31	–

Animal community

Habitat for Wildlife:
This ecological site provides habitats which support a resident animal community that is characterized by badger, kit fox, desert cottontail, Ord's kangaroo rat, northern grasshopper mouse, scaled quail, mourning dove, Woodhouse's toad, lesser earless lizard, and prairie rattlesnake.

While not residents, pronghorn antelope and mule deer will move out of adjacent habitats to feed on this site.

Hydrological functions

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

Hydrologic Interpretations
Soil Series---------Hydrologic Group
Bluewing----------B
Bluewing Saline----------D
Calladito----------A
Mayqueen----------B
Sheppard----------A
Shiprock----------B
Stumble----------A

Recreational uses

No Data

Wood products

No Data

Other products

Grazing:
This site is suitable for grazing use by cattle, sheep, horses, antelope, burros, and small herbivorous animals. Various birds use this site for food and shelter. Under the pressure of uncontrolled grazing, the potential plant community deteriorates, and there is a marked increase in relative abundance of shrubs, cacti, and perennial forbs. The density of palatable perennial grasses will decrease, and there will be an increase in the density of forbs and annual plants. This results in unprotected soil during part of the year, which increases the wind erosion hazard. In severe deterioration, the site will consist predominantly of shrubs, sandhill muhly, some perennial forbs, and large areas of unprotected soil; juniper may invade this site.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index----------Ac/AUM
100 - 76----------6.0 – 14.0
75 – 51----------8.0 – 18.0
50 – 26----------14.0+
25 – 0----------18.0++

Type locality

Location 1: San Juan County, NM	
Township/Range/Section	T27 N R11 W S16

General legal description	A typical pedon of Sheppard loamy fine sand in San Juan County, New Mexico, on a ridge 2,045 feet south and 725 feet east of the northeast corner of Section 16, T27N, R11W.

Other references

Data collection for this site was done in conjunction with the progressive soil surveys within the San Juan River Valley, Mesas and Plateaus, Major Land Resource Area 35 of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: San Juan, McKinley.

Characteristic soils are:
Sheppard, Mayqueen, Shiprock, Stumble

Other soils included are:
Bluewing, Calladito

Contributors

Don Sylvester
Elizabeth Wright
John Tunberg
Michael Carpinelli

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:**

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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:**
