

Ecological site R042BB011NM

Deep Sand, Desert Shrub

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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.

Associated sites

R042BB012NM	Sandy, Desert Shrub This site often integrades with Sandy Sites.
R042BB024NM	Gravelly Sand, Desert Shrub This site often integrades with Gravelly Sand sites.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on level to gently sloping old eolian and alluvial deposits. Slopes range from 1 to 9 percent and average about 3 percent. Elevations range from about 3,800 to 5,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Basin floor (2) Sand sheet (3) Fan remnant
Flooding duration	Extremely brief (0.1 to 4 hours) to brief (2 to 7 days)
Flooding frequency	Very rare to rare

Ponding frequency	None
Elevation	1,160 – 1,520 m
Slope	0 – 10 %
Aspect	Aspect is not a significant factor

Climatic features

Annual average precipitation ranges from 7.35 to 11.90 inches. Wide fluctuations from year to year are common, ranging from a low of about 2 inches to a high of over 20 inches. At least one-half of the annual precipitation comes in the form of rainfall during July, August, and September. Precipitation in the form of snow or sleet averages less than 4 inches annually. The average annual air temperature is about 60 degree F. Summer maximums can exceed 100 degrees F. and winter minimums can go below zero. The average frost-free season exceeds 200 days and extends from April 1 to November 1. Both the temperature regime and rainfall distribution favor warm-season perennial plants on this site. Spring moisture conditions are only occasionally adequate to cause significant growth during this period of year. High winds from the west and southwest are common from March to June, which further tends to create poor soil moisture conditions in the springtime.

Climate data was obtained from
<http://www.wrcc.dri.edu/summary/climsmnm.html>
web site

Table 3 Representative climatic features

Frost-free period (average)	210 days
Freeze-free period (average)	230 days
Precipitation total (average)	310 mm

Influencing water features

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

Soil features

The soils are moderately deep to deep. The surface layer is typically a sand or loamy sand overlying fine sandy loams, loamy sands to sands. They may have accumulations of calcium carbonate below 20 inches. The soils are frequently calcareous throughout. They are well drained and moderately rapid to rapidly permeable with moderate water-holding capacity. Because of the sandy surface and inability to hold a large amount of water, if unprotected, wind blowing becomes severe.

Table 4. Representative soil features

Surface texture	(1) Loamy fine sand (2) Loamy sand (3) Sand
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Family particle size	(1) Sandy
Drainage class	Well drained to excessively drained
Permeability class	Moderately slow to rapid
Soil depth	60 – 150 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	5.08 – 12.7 cm
Electrical conductivity (0-101.6cm)	0 – 10 mmhos/cm
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:

This site often intergrades with either the Sandy or Gravelly sand sites. Deep sand sites located on hills, known as Sandhills sites in Texas, are present in SD-2 and are included here. The soil profiles of dunes in the mesquite-dominated state in the Sandy site are similar to those of Deep sand sites, and this state and site have been equated. It is unknown, however, if mesquite coppice dunes sites could support Deep sand plant communities. They may not, due perhaps to differences in landscape position or the size of the deep sand soil patches, which are relatively small in Sandy sites. Until it is demonstrated that Sandy-derived coppice dunes can be rehabilitated as Deep sand sites (which has not yet been attempted so far as the author is aware) it is best to treat these as separate classifications. The historic plant community type of the Deep sand site is dominated by dropseeds (*Sporobolus flexuosus*, *S. contractus*, *S. cryptandrus*), especially the giant dropseed (*S. giganteus*). Black grama (*Bouteloua eriopoda*) and bush muhly (*Muhlenbergia porteri*) are also important grasses. Under heavy grazing pressure, the more

palatable black grama and bush muhly decline, and eventually dropseeds decline. Shrubs that are common in the site, including sand sage (*Artemisia filifolia*) and broom dalea (*Psoralea scoparius*), increase in representation and cover with grazing or perhaps due to climate change. Honey mesquite (*Prosopis glandulosa*) may invade or increase. Shrub control and grazing management results in varying degrees of restoration or grass cover in some cases. In other cases, grass cover is highly reduced and broom dalea and/or sand sage persist as dominants or mesquite dunes may persist. It is not known what soil or climatic changes underlie these persistent vegetation changes.

No systematic studies of communities, states or transitions have been performed in Deep sand sites in SD-2. Because of the unique plant communities and soils of these sites, studies of soil variation among sites exhibiting different states would provide a useful contribution.

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	Warm Season			87-109	
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	87-109	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	87-109	–
	mesa dropseed	SPFL2	<i>Sporobolus flexuosus</i>	87-109	–
2	Warm Season			130-152	
	giant dropseed	SPGI	<i>Sporobolus giganteus</i>	130-152	–
3	Warm Season			21-44	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	21-44	–
4	Warm Season			4-21	
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	4-21	–
5	Warm Season			4-21	
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	4-21	–
6	Warm Season			4-13	
	threeawn	ARIST	<i>Aristida</i>	4-13	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	4-13	–
7	Warm Season			4-13	
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	4-13	–
Shrub/Vine					
8	Shrub			21-44	
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	21-44	–
	broom dalea	PSSC6	<i>Psoralea scoparius</i>	21-44	–
	yucca	YUCCA	<i>Yucca</i>	21-44	–
9	Shrub			4-21	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	4-21	–
	littleleaf sumac	RHMI3	<i>Rhus microphylla</i>	4-21	–
10	Shrub			4-21	
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	4-21	–
11	Shrub			4-21	
	mormon tea	EPVI	<i>Ephedra viridis</i>	4-21	–

	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	4-21	–
Forb					
12	Forb			4-13	
	dwarf desertpeony	ACNA2	<i>Acourtia nana</i>	4-13	–
	woolly plantain	PLPA2	<i>Plantago patagonica</i>	4-13	–
13	Forb			4-13	
	herb sophia	DESO2	<i>Descurainia sophia</i>	4-13	–
	touristplant	DIWI2	<i>Dimorphocarpa wislizeni</i>	4-13	–
	redstem stork's bill	ERCI6	<i>Erodium cicutarium</i>	4-13	–
	buckwheat	ERIOG	<i>Eriogonum</i>	4-13	–
	spurge	EUPHO	<i>Euphorbia</i>	4-13	–
	bladderpod	LESQU	<i>Lesquerella</i>	4-13	–
14	Forb			13-21	
	Indian blanket	GAPU	<i>Gaillardia pulchella</i>	13-21	–
	woolly paperflower	PSTA	<i>Psilostrophe tagetina</i>	13-21	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	13-21	–
15	Annual Forbs			4-21	
	Forb, annual	2FA	<i>Forb, annual</i>	4-21	–
16	Perennial Forbs			4-21	
	Forb, perennial	2FP	<i>Forb, perennial</i>	4-21	–

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 3.1 plant community composition

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

This site provides habitat which supports a resident animal community that is characterized by pronghorn antelope, badger, kit fox, spotted ground squirrel, desert pocket mouse, Ord kangaroo rat, southern plains woodrat, scaled quail, pyrrhuloxia, roadrunner, burrowing owl, desert horned lizard, and Couch's spadefoot toad. Where large mesquite and yucca ar4e present on this site, white necked raven and mourning dove nest. When site deterioration produces a dune-interdune aspect with mesquite invasion, animal population densities shift in favor of burrowing mammals, their predators and hrubdependent birds.

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 Bluepoint-----A Pintura-----A Yturbide-----A

Recreational uses

Suitability for camping and picnicking is fair, and hunting is fair for pronghorn antelope, quail, dove, small game, and waterfowl where seasonal open water occurs. Photography and bird watching for numerous birds, raptors and others can be fair to good, especially during migration seasons. Most small animals of the site are nocturnal and secretive, seen only at night, early morning or evening. Scenic beauty is greatest during spring and sometimes summer months when flowering of forbs, shrubs, and cacti occurs.

Wood products

The site has no significant value for wood products.

Other products

This site at its potential is suitable for grazing in all seasons of the year. Green forage in the form of forbs and a few early season grasses are occasionally produced in significant amounts in the spring. The dominant production comes in the summer. The site is suitable for use by all classes of livestock. Site deterioration caused by inadequate grazing management is characterized by a decrease or disappearance of black grama and bush muhly, an increase in sand sagebrush and broom delea, mesquite invasion, and eventual dunning or hummocking. The dropseeds may also decrease, coming and going with good and bad years but unable to hold a consistent footing even in normal years. Site recovery can be reasonably rapid following mesquite control coupled with good grazing management. Given adequate opportunity, secondary succession will take place, usually by fourwing saltbush replacing the mesquite, and after several years a gradual re-establishment of the dropseeds and other plants more typical of the natural potential for the site.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month Similarity Index-----Ac/AUM 100 - 76-----5.0 – 5.9 75 – 51-----5.6 – 7.1 50 – 26-----6.8 – 16.0 25 – 0-----16.0 - +

Other 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. Sierra County Dona Ana County Grant County Hidalgo County Luna County Otero County

Characteristic Soils Are:

Bluepoint loamy fine sand

Pintura loamy fine sand

Yturbide loamy sand

Other Soils included are:

Wink loamy fine sand, more than 5"surface

Hucco loamy fine sand, more than 5"surface

Yturbide gravelly sand

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:
