USDA Natural Resources Conservation Service

Ecological site R042BB005NM
Gyp Interdune (Dry), Desert Shrub

Accessed: 05/05/2024

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.

Associated sites

R042BB003NM	**Vegetated Gypsum Dunes, Desert Shrub** This site occurs in a complex with the Vegetated Gypsum dunes site. Vegetation composition and production on the interdune is influenced by proximity to the base of the associated dune.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs as the interdunal areas within the parabolic dunefields. The trough-like interdune is a mixture of lower lying areas and small low relict stabilized dunes. The interdune is flanked by the larger active parabolic dunes. Elevation ranges from approximately 3900 to 4200 feet above sea level. Slope of the interdune landform averages 1 to 3 percent. However, slopes of the low relict stabilized dunes averages 1 to 10 percent.

Table 2. Representative physiographic features

Landforms	(1) Interdune
Flooding frequency	None
Ponding frequency	None
Elevation	1,189–1,280 m
Slope	1–10%
Water table depth	127–183 cm
Aspect	Aspect is not a significant factor

Climatic features

Annual average precipitation ranges from 7 to 12 inches. Wide fluctuations from year to year are common. 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

Table 3. Representative climatic features

Frost-free period (average)	205 days
Freeze-free period (average)	227 days
Precipitation total (average)	305 mm

Influencing water features

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

Soil features

The soils on these sites are gypsiferous sandy eolian deposits overlain by high cover of dark colored biological crusts. Gypsum is present in high amounts (60-90 %) throughout the soil profile. Surface and underlying soils of the low stabilized dunes are gypsiferous sand. The lower lying interdune areas are gypsiferous very fine sandy loams over gypsiferous sand. The soils of this site are excessively drained and exhibit rapid permeability.

Characteristic Soils:
NM-688 MU-422 Astrobee-Lark Association, 0-35 percent slopes.

Table 4. Representative soil features

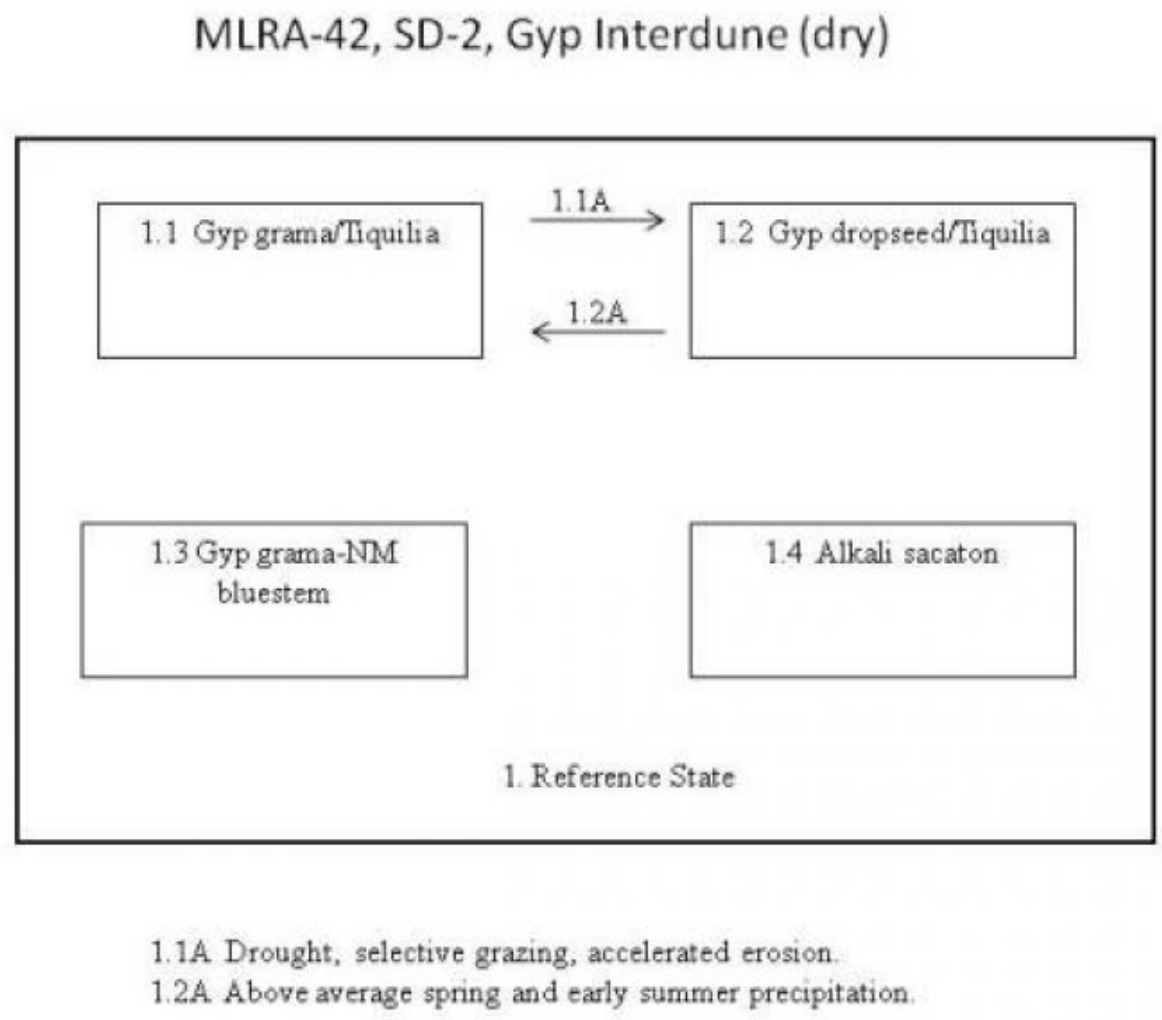
Parent material	(1) Eolian deposits–rock gypsum
Surface texture	(1) Gypsiferous sand
Family particle size	(1) Sandy
Drainage class	Excessively drained
Permeability class	Moderate
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	10.16–13.46 cm
Calcium carbonate equivalent (0-101.6cm)	1–3%
Electrical conductivity (0-101.6cm)	2–5 mmhos/cm
Soil reaction (1:1 water) (0-101.6cm)	7.9–8.4

Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Overview: Plant community composition, distribution, and production within the interdune, are controlled by numerous factors. Some of which include the depth to ground water, quality of water, salinity level, and the effects of wind. Many of these factors are related. Where the ground water level is a little deeper and the surface soils are above the capillary fringe, water that infiltrates and remains in the pore spaces available for plants is not contaminated by the deeper saline ground water. These freshwater lenses may affect production and composition across segments of the interdune. Parabolic dunes like other dunes move in space over time. While the arms of the dune are partially stabilized by vegetation the center of the dune migrates fastest directed by the wind. Various communities may result due to these ongoing changing conditions within the associated interdune.

State and transition model



State 1
Grass/Shrub

This state is characterized by several different plant communities.

Community 1.1
Gyp grama/Tiquilia

Figure 4. Gyp grama/Tiquilia

This community is dominated by gyp grama and tiquilia. NM bluestem is usually sparse. Other species typically include ephedra, soaptree yucca, frosted mint, gyp dropseed and sand verbena. Cryptobiotic cover is typically high averaging 50 percent. This community can be fairly productive.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	179	336	488
Shrub/Vine	112	280	347
Forb	28	56	73
Total	**319**	**672**	**908**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	5-15%
Grass/grasslike foliar cover	15-20%
Forb foliar cover	2-5%
Non-vascular plants	0%
Biological crusts	25-70%
Litter	15-25%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	5-20%

Community 1.2
Gyp dropseed/Tiquilia

Figure 6. Gyp dropseed/Tiquilia

Figure 7. Firebee Pit

This community is dominated by gyp dropseed and tiquilia. Other species include ephedra, gyp grama, gyp moonpod, and gyp phacelia. This is the least productive community and plant cover is typically sparse. If gyp grama is present it typically is densest near the edges of the interdune approaching the base of the parabolic dunes.

Community 1.3
Gyp grama-NM bluestem

Figure 8. Gyp grama-NM bluestem

This community is a dominated by gyp grama and NM bluestem. The sub-shrub hairy crinklemat (*Tiquilia hispidissima*) is present in varying amounts. This community tends to occur on areas that exhibit depositional loose sands on the surface. One idea is these areas have more available soil moisture, and that the loose sands and increased moisture favor seed contact and germination. In the Tularosa basin, New Mexico bluestem is limited in extent by available water. Precipitation in the area barely meets minimal requirements. Recurring drought and to

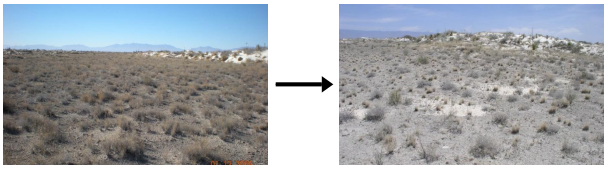
some extent selective grazing may effect a community change resulting in a decrease or absence of NM bluestem. Gyp grama has an advantage in reproductive capability, being able to reproduce both vegetatively and from seed.

Community 1.4
Alkali sacaton

Figure 9. Alkali sacaton

This community is dominated by alkali sacaton. Other species typically include varying amounts of gyp grama, gyp dropseed, tiquilia, frankennia, fourwing saltbush, rabbitbrush, and Hartweg's sundrops. This community may occur where soils exhibit a increase in salinity such as areas adjacent to the barchanoid dune/interdunes.

Pathway 1.1A
Community 1.1 to 1.2



Gyp grama/Tiquilia **Gyp dropseed/Tiquilia**

The various plant communities that occur on this site naturally are believed to result from differences in quality and depth to ground water, salinity level and wind pattern erosional force. Alternatively, areas that are subjected to drought and heavy grazing pressure by wildlife and or livestock may shift the community to a less productive gyp dropseed/ tiquilia community.

Pathway 1.2A
Community 1.2 to 1.1

Gyp dropseed/Tiquilia **Gyp grama/Tiquilia**

Above average spring and early summer precipitation combined with proper grazing use may help to shift the community composition back to the more productive gyp grama/tiquilia community.

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	**Warm Season Short Grasses**			168–448	
	gypsum grama	BOBR	*Bouteloua breviseta*	168–448	–
	gyp dropseed	SPNE	*Sporobolus nealleyi*	28–112	–
2	**Cool Season short grass**			0–11	
3	**Warm Season mid-grasses**			11–28	
	little bluestem	SCSCS	*Schizachyrium scoparium var. scoparium*	6–17	–
	alkali sacaton	SPAI	*Sporobolus airoides*	6–17	–
	spike dropseed	SPCO4	*Sporobolus contractus*	0–11	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	0–11	–
Forb					
4	**Perennial forbs**			17–56	
	White Sands fanmustard	NELI	*Nerisyrenia linearifolia*	11–22	–
	woolly paperflower	PSTA	*Psilostrophe tagetina*	3–17	–
	purple sand verbena	ABAN	*Abronia angustifolia*	6–17	–
	hoary tansyaster	MACA2	*Machaeranthera canescens*	3–17	–
	sand fiddleleaf	NACA	*Nama carnosum*	0–8	–
	Hartweg's sundrops	CAHA14	*Calylophus hartwegii*	0–6	–
	greenthread	THELE	*Thelesperma*	0–6	–
5	**Annual forb**			11–17	
	Forb, annual	2FA	*Forb, annual*	6–17	–
	whitestem blazingstar	MEAL6	*Mentzelia albicaulis*	6–17	–
Shrub/Vine					
6	**Sub-shrubs**			84–280	
	hairy crinklemat	TIHI	*Tiquilia hispidissima*	84–280	–
	James' seaheath	FRJA	*Frankenia jamesii*	0–56	–
	lanceleaf moonpod	SELA3	*Selinocarpus lanceolatus*	6–39	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	6–17	–
	southern goldenbush	ISPL	*Isocoma pluriflora*	0–17	–
7	**Shrubs**			22–56	
	Torrey's jointfir	EPTO	*Ephedra torreyana*	22–56	–
	Trans-Pecos false clapdaisy	PSAR	*Pseudoclappia arenaria*	0–17	–
	frosted mint	POIN3	*Poliomintha incana*	0–6	–
8	**Succulents**			6–11	
	tulip pricklypear	OPPH	*Opuntia phaeacantha*	6–11	–
	soaptree yucca	YUEL	*Yucca elata*	6–11	–

Animal community

Characteristic wildlife includes little striped whiptail, White Sands prairie lizard, bleached earless lizard, spadefoot toad, Apache pocket mouse, White sands woodrat, spotted ground squirrel, camel cricket, tiger beetle, lycosid spider, and scorpions. Ord’s kangaroo rat and spotted ground squirrel.

Recreational uses

This site has potential for camping, hiking, and picnicking. 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 yucca occurs.

Wood products

This site has no significant value for wood products.

Other products

Gypsum

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, Major Land Resource Areas of New Mexico. This site has been mapped and correlated with soils in the following soil surveys. White Sands Missile Range, White Sands National Monument.

Other references

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Muldavin, E., Chauvin, Y., Harper, G., 2000 The Vegetation of White Sands Missile Range, New Mexico. Volume 1: Handbook of Vegetation Communities. Final Report, New Mexico Natural Heritage Program. University of New Mexico. Albuquerque, New Mexico.

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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:

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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:**
