Ecological site R042BB015NM
Shallow Sandy,
Desert Shrub

Accessed: 09/19/2026

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.

Similar sites

R042BB012NM	**Sandy, Desert Shrub** This site is similar to the Sandy ecological site but is differentiated by the shallow depth to a petrocalcic horizon.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on gently sloping to undulating hill slopes, fan piedmonts, basin floors, fan remnants and fan piedmonts. Occasionally on gently rolling upland slopes. Slope range from 1 to 15 percent and average less than 9 percent. Elevations range from abut 4,000 to 5,000 feet.

They formed in old alluvial and eolian deposits from mixed sources.

Table 2. Representative physiographic features

Landforms	(1) Fan piedmont (2) Alluvial fan (3) Basin floor
Flooding frequency	None to very rare

Ponding frequency	None
Elevation	1,220 – 1,520 m
Slope	0 – 10 %
Water table depth	250 cm

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

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

Soil features

Soils are shallow, 20 inches or less in depth. Surface textures are sandy loam, gravelly fine sandy loam, loamy sand, gravelly loamy fine sand, or occasionally gravelly clay loams. Subsurface textures are sandy clay loam, fine sandy loam, loamy fine sand, gravelly loamy fine sand, gravelly sandy clay loam, loamy sand, sandy loam or very gravelly loamy fine sand. The restrictive layer is usually indurated caliche at a shallow depth.

The soil blowing hazard becomes severe when the surface is not adequately protected by cover.

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

Characteristic soils:
Simona
Aftaden
Cave
Courthouse
Cruces
Pintura
Minlith
Elbutte

Table 4. Representative soil features

Surface texture	(1) Sandy loam (2) Loamy sand (3) Gravelly fine sandy loam
Family particle size	(1) Sandy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Very slow to rapid
Soil depth	10 – 50 cm
Surface fragment cover <=3"	0 – 20 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	2.54 – 7.62 cm
Calcium carbonate equivalent (0-101.6cm)	10 – 30 %

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 – 8.6
Subsurface fragment volume <=3" (Depth not specified)	10 – 40 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

Overview

This site usually exists as a finely-scaled mosaic with the Sandy site depending on local variation to the depth of indurated caliche (petrocalcic horizon). The historic plant community type of the Shallow sandy site is dominated by black grama (Bouteloua eriopoda) and other grasses, especially dropseeds (Sporobolus spp.). The site differs from
the Sandy site in the greater production and dominance of black grama compared to other grass species in the historic community. As in the Sandy site, black grama is a key plant of this site due to its dominance under pristine
conditions, its high forage value, and its consequent sensitivity to grazing. The nature of the states, communities, and transitions are nearly identical to the Sandy site, but the frequency with which communities are observed differs between the sites. Overall, the probability of transitions to degraded states may be lower in the Shallow sandy than
in the Sandy site due to the role of the petrocalcic horizon in maintaining water at grass rooting depth and physically impeding the progress of deeper shrub roots. Despite this effect, overgrazing and/or summer drought decreases the proportional representation of black grama and dropseeds, and threeawns (Aristida spp.) and snakeweed (Xanthocephalum spp) tend to increase in abundance. Shifts away from black grama dominance are thought to be due to overgrazing and/or multi-year periods of summer drought, or due to the introduction of honey mesquite (Prosopis glandulosa) seeds with or without grazing. With continuous heavy grazing, the proportional
representation of black grama declines because it is preferred by cattle over dropseeds, threeawns and snakeweed (Paulsen and Ares 1962). Dropseeds are more palatable than threeawns, so dropseeds may also decline relative to threeawns and snakeweed. Under climatic conditions that are not conducive to black grama reproduction, or due to some degree of soil degradation, demographic limitations may lead to persistent absence of black grama, even without shrub invasion. Shrub invasion is, however, very common. Loss of soil stability and/or a reduction in black
grama cover may permit either the survival or establishment mesquite seedlings due to reduced competition or fire frequency. Subsequent grazing by by livestock and native herbivores, competition from shrubs, erosion, and concentration of nutrients under adult shrubs eventually leads to peristent reductions of grass cover and mesquitedominated
coppice dunes with bare or snakeweed-dominated interdunal areas. The large (2-3 m tall) coppice dunes observed in the Sandy site are not observed, due to the restriction imposed on erosion by the shallow caliche layer.

The nature of the information reported for the Sandy site also applies to this site. All of the work has been carried out in the Chihuahuan Desert Rangeland Research Center (College Ranch) of New Mexico State University and the Jornada Experimental Range. It should be noted that in many instances, soils of plots on the Jornada identified as Simona-Harrisburg association (Dona Ana County Soil Survey) belong to both the Sandy and Shallow sandy ecological site. Soil trenches excavated on the Jornada indicate that the alternation between conditions characteristic of each these ecological sites occurs on the scale of meters. Thus, it is difficult to associate many studies to a single ecological site in this area. Exceptions may include the studies of Hennessy et al. (1983a), Fusco et al. (1995), Warren et al. (1996), and Gibbens et al. (1992).

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**			230-287	
	black grama	BOER4	*Bouteloua eriopoda*	230-287	–
2	**Warm Season**			6-29	
	bush muhly	MUPO2	*Muhlenbergia porteri*	6-29	–
3	**Warm Season**			57-86	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	57-86	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	57-86	–
4	**Warm Season**			6-29	
	tobosagrass	PLMU3	*Pleuraphis mutica*	6-29	–
5	**Warm Season**			17-29	
	threeawn	ARIST	*Aristida*	17-29	–
6	**Warm Season**			6-17	
	low woollygrass	DAPU7	*Dasyochloa pulchella*	6-17	–
7	**Warm Season**			6-17	
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	6-17	–
8	**Warm Season**			0-29	
	blue grama	BOGR2	*Bouteloua gracilis*	0-29	–
9	**Warm Season**			6-29	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	6-29	–
Shrub/Vine					
10	**Shrub**			6-17	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	6-17	–
11	**Shrub**			6-17	
	fourwing saltbush	ATCA2	*Atriplex canescens*	6-17	–
12	**Shrub**			6-29	
	longleaf jointfir	EPTR	*Ephedra trifurca*	6-29	–
	soaptree yucca	YUEL	*Yucca elata*	6-29	–
13	**Shrub**			17-46	
	winterfat	KRLA2	*Krascheninnikovia lanata*	17-46	–
Forb					
14	**Forb**			29-57	
	dwarf desertpeony	ACNA2	*Acourtia nana*	29-57	–
	desert marigold	BAMU	*Baileya multiradiata*	29-57	–
	croton	CROTO	*Croton*	29-57	–
	redstem stork's bill	ERCI6	*Erodium cicutarium*	29-57	–
	buckwheat	ERIOG	*Eriogonum*	29-57	–
	woolly paperflower	PSTA	*Psilostrophe tagetina*	29-57	–
	Russian thistle	SAKA	*Salsola kali*	29-57	–
15	**Forb**			6-17	
	horsetail milkweed	ASSU2	*Asclepias subverticillata*	6-17	–

	milkvetch	ASTRA	*Astragalus*	6-17	–
	threadleaf ragwort	SEFLF	*Senecio flaccidus var. flaccidus*	6-17	–
16	**Annual Forb**			6-29	
	Forb, annual	2FA	*Forb, annual*	6-29	–
17	**Perennial Forb**			6-29	
	Forb, perennial	2FP	*Forb, perennial*	6-29	–

Table 6. Community 2.1 plant community composition

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

Table 7. Community 3.1 plant community composition

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

Table 8. Community 4.1 plant community composition

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

Table 9. Community 5.1 plant community composition

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

Animal community

This site provides habitat which support a resident animal community that is characterized by pronghorn antelope, kit fox, hooded skunk, desert cottontail, desert pocket gopher, desert pocket mouse, ord kangaroo rat, roadrunner, scaled quail, meadowlark, prairie rattlesnake and little striped whiptail. Where woody vegetation is present, this site serves as a breeding area for mourning dove and mocking bird.

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 Simona D Cruces D Aftaden D Cave D Courthouse D Pintura A Minlith D Elbutte

Recreational uses

Suitability for camping and picnicking is fair, and hunting is fair for pronghorn antelope, quail, dove, and small game. Photography and bird-watching 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

This 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, although most of the green froage is produced during the summer months. The site is suitable for cattle, sheep, goats, and horses, generally without regard to class of animals. Site deterioration caused by inadequate grazing management is characterized by the decrease of such plants as black grama, bush muhly, fourwing saltbush, and winterfat. These plants are replaced by such plants as threeawns, fluffgrass, dropseeds, and annuals. Substantial stands of broom snakeweed may be a sign of serious retrogression, as well as invasion by mesquite. A reasonably rapid rate of recovery can be effected, however, through good grazing management and, when needed, mesquite control.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month Similarity Index Ac/AUM 100 - 76 3.5 – 4.7 75 – 51 4.5 – 6.5 50 – 26 6.0 – 10.5 25 – 0 10.5 - +

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:
Simona fine sandy loam
Cruces fine sandy loam
Simona loamy fine sand
Cruces loamy fine sand

Other Soils included are:
Minlith gravelly loam y fine sand
Tonuco loamy fine 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:**

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2. **Presence of water flow patterns:**

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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):**

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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:**
