

Ecological site R042BB019NM
Limy,
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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on slightly concave slopes or nearly level gently sloping to undulating piedmont slopes, drained lake beds, or alluvial fans or fan remnant. The soils formed in medium and moderately fine textured material high in carbonates that is mostly of alluvial or lacustrine origin with small amounts of eolian material. Slopes range from 1 to 5 percent on the average, the masonfort soil may have slopes up to 15 percent, but usually average less than 5 percent. Elevations range from about 3,800 to 5,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Fan remnant (3) Fan piedmont
Flooding frequency	None
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>

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 wetlands or streams.

Soil features

The soils of this site are deep to very deep. The surface layer is a calcareous loam, fine sandy loam, silty clay loam or clay loam containing less than 15 percent gravel. The substratum is a loam, clay loam, sandy clay loam and may have a weakly cemented calcium layer above the very strongly to a carbonatic layer to a depth of 60 inches or more.

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

Characteristic Soils:

- Jal
- Karro
- Masonfort
- turney

Table 4. Representative soil features

Surface texture	(1) Loam (2) Gravelly sandy loam (3) Silt loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderately rapid to moderately slow

Soil depth	0 – 150 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	5.08 – 17.78 cm
Calcium carbonate equivalent (0-101.6cm)	10 – 60 %
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 – 10
Subsurface fragment volume <=3" (Depth not specified)	0 – 20 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

Overview This ecological site is associated with gravelly and loamy ecological sites. Limy sites are uncommon in SD-2. The principal ecological feature separating this site from sandy and loamy sites is the high amount of calcium carbonate throughout the profile and the presence of a white, calcareous horizon within 10-20". The high levels of calcium carbonate may reduce infiltration rates and inhibit the uptake of some nutrients (e.g. phosphorus; Lathja and Schlesinger 1988) so this site may be more stressful than sites of similar texture, and more easily subject to degradation. On the other hand, water that does penetrate may be held in the soil for longer periods than in soil of similar texture without high carbonate levels. In any case, the authors have been unable to locate limy soils harboring grassland. The historic plant community type is assumed to exhibit dominance by black grama (*Bouteloua eriopoda*) and secondarily bush muhly (*Muhlenbergia porteri*). Creosotebush (*Larrea tridentata*) and tarbush (*Flourensia cernua*) are present and annuals are important components. Loss of grasses due to overgrazing and/or drought, or due to climate change, may lead to a transition to dominance by shrubs. In other cases, shrubs may not increase and the community is dominated by threeawns (*Aristida* spp.) and fluffgrass (*Dasyochloa pulchella*). Persistent reductions of grass permits wind erosion, leading to loss of soil fertility, eventual loss of the A horizon, and exposure of the calcic horizon at which point only a few shrubs and annuals may persist.

No studies have been conducted on the ecology of the limy ecological site.

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				130-174	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	130-174	–
2				21-44	
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	21-44	–
3				13-35	
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	13-35	–
4				4-21	
	cane bluestem	BOBA3	<i>Bothriochloa barbinodis</i>	4-21	–
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	4-21	–
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	4-21	–
5				4-21	
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	4-21	–
6				21-44	
	threeawn	ARIST	<i>Aristida</i>	21-44	–
	burrograss	SCBR2	<i>Scleropogon brevifolius</i>	21-44	–
7				4-21	
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	4-21	–
8				4-13	
	Grass, annual	2GA	<i>Grass, annual</i>	4-13	–
9				4-13	
	Grass, perennial	2GP	<i>Grass, perennial</i>	4-13	–
Shrub/Vine					
10				4-21	
	American tarwort	FLCE	<i>Flourensia cernua</i>	4-21	–
	creosote bush	LATR2	<i>Larrea tridentata</i>	4-21	–
11				4-13	
	crown of thorns	KOSP	<i>Koeberlinia spinosa</i>	4-13	–
12				4-13	
	littleleaf ratany	KRER	<i>Krameria erecta</i>	4-13	–
	mariola	PAIN2	<i>Parthenium incanum</i>	4-13	–
13				4-13	
	soaptree yucca	YUEL	<i>Yucca elata</i>	4-13	–
14				4-13	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	4-13	–
15				4-13	
	jointfir	EPHED	<i>Ephedra</i>	4-13	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	4-13	–
16				4-13	
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	4-13	–

Forb					
17				13-21	
	dwarf desertpeony	ACNA2	<i>Acourtia nana</i>	13-21	–
	croton	CROTO	<i>Croton</i>	13-21	–
	touristplant	DIWI2	<i>Dimorphocarpa wislizeni</i>	13-21	–
	buckwheat	ERIOG	<i>Eriogonum</i>	13-21	–
	whitestem paperflower	PSCO2	<i>Psilostrophe cooperi</i>	13-21	–
	Russian thistle	SAKA	<i>Salsola kali</i>	13-21	–
18				21-44	
	Forb, annual	2FA	<i>Forb, annual</i>	21-44	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	21-44	–

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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Table 8. Community 4.1 plant community composition

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

This site provides habitat which support a resident animal community that is characterized by pronghorn antelope, badger, desert pocket mouse, bannertail kangaroo rat, southern plains woodrat, marsh hawk, loggerhead shrike, black-throated sparrow, meadowlark, Texas horned lizard, western hognose snake, couch's spadefoot toad and Woodhouse's toad.

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 Jal B karro B Turney B Masonfort D

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 and shrubs 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 forage is produced during summer months. The site is suitable for grazing by all classes of livestock. In order to maintain and improve this site, grazing management that includes a flexible stocking rate is especially important.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month Similarity Index Ac/AUM 100 - 76 7.0 – 8.0 75 – 51 7.5 – 8.9 50 – 26 8.5 – 13.0 25 – 0 13.0 - +

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:

Jal fine sandy loam

Karro loam and silty clay loam, fine sandy loam

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:
