

Ecological site R042BB023NM
Clayey,
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

R042BB014NM	Loamy, Desert Shrub Loamy Ecological Site. This ecological site is often spatially associated with Draw, Bottomland, and Loamy ecological sites with which it may intergrade and share dominant species.
R042BB016NM	Draw, Desert Shrub Draw Ecological Site
R042BB018NM	Bottomland, Desert Shrub Bottomland Ecological Site.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site usually occurs on piedmont slopes, alluvial flats, or permanently drained floodplains. These soils formed in slightly to moderately calcareous mixed alluvial sediments derived from sedimentary material. Slopes are usually flat, averaging less than 5%. Elevations range from 3,800 feet to 5,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Fan piedmont (2) Flood plain (3) Alluvial flat
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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 wetland or stream.

Soil features

Soils are deep and very deep. Surface layer is cobbly clay, cobbly clay loam, clay loam, silty clay loam or sandy clay loam. Substratum is a clay, clay loam, sandy clay loam gravelly clay loam or sandy clay. Subsoil is a clay, clay loam, sandy clay loam, gravelly clay loam or gravelly loam. They vary from noncalcareous to calcareous throughout the profile. They are slow to very slow permeable, and run-off is slow to rapid.

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

Characteristic Soils

Belen
Caticon
Harkey
Keno
Mimbres

Ubar
Vekol
Steller
Elbutte*

*Note: Some shallow or very shallow soils with Clay loam, Clay or gravelly clay loam textures have been included in this ESD. A shallow clayey ESD may be developed

Table 4. Representative soil features

Surface texture	(1) Gravelly clay loam (2) Clay (3) Sandy clay loam
Family particle size	(1) Clayey
Drainage class	Well drained to moderately well drained
Permeability class	Moderately slow to slow
Soil depth	150 – 180 cm
Surface fragment cover <=3"	0 – 20 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	15.24 – 20.32 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 20 %
Electrical conductivity (0-101.6cm)	0 – 10 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0 – 10
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 often spatially associated with Draw and Bottomland sites. This site often intergrades with Loamy ecological sites with which it may share dominant species. The presumed historic plant community type of this site is dominated by tobosa (*Pleuraphis mutica*) and, perhaps, to a lesser extent by black grama (*Bouteloua eriopoda*). Unfortunately, no reference areas exhibiting co-dominance by black grama have been located within SD- 2 (including records to the year 1918). Alternatively, black grama may have occurred in relatively sandy spots and

areas receiving less run-in water. Generally, transitions within this ecological site appear to be governed by patterns of soil water availability, changes to soil structure, and soil truncation. A shift to extreme dominance by first tobosa and then burrograss (*Scleropogon brevifolius*) may occur in response to grazing or drought. On some soils (e.g. Reagan clay loam), burrograss may be naturally dominant and/or be more likely to increase in response to grazing than on other soils (e.g. Stellar clay loam). It is also possible that instances of burrograss dominance are related to decreased soil moisture due to small-scale drainage patterns. Shrub encroachment by a variety of species, including tarbush (*Flourensia cernua*), mesquite (*Prosopis glandulosa*) and creosotebush (*Larrea tridentata*) occurs within this site as bare patches increase. Shrub dominance and grass loss is associated with truncation of the A horizon and, in many cases, sealing of the eroded soil surface. Subsequent loss of shrubs or continued soil degradation in the absence of shrub seeds may produce a nonvegetated clay flat, which may accumulate salts or carbonate at the surface.

Little quantitative information exists concerning the causes of transitions between grassland types and to shrubinvaded grasslands or pure shrublands. No systematic studies exist regarding the effects of range management on grassland-shrubland transitions in the lowland ecological sites. The limited information provided by Buffington and Herbel (1965) and Gibbens and Beck (1987) indicates that the relationship between grazing intensity and grasslandshrubland transitions is unclear. Overall, tobosa and burrograss grasslands characteristic of clayey soils are more stable and recover faster than black grama grasslands in the face of drought, likely due to the location of tobosa and burrograss on heavier soils that retain water at rooting depth for longer periods. Additionally, tobosa and burrograss are generally less palatable than black grama, leading to reduced utilization of these communities.

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				157-179	
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	157-179	–
2				45-67	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	45-67	–
3				22-67	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	22-67	–
4				22-45	
	burrograss	SCBR2	<i>Scleropogon brevifolius</i>	22-45	–
5				0-22	
	vine mesquite	PAOB	<i>Panicum obtusum</i>	0-22	–
6				4-22	

	threeawn	ARIST	<i>Aristida</i>	4-22	–
7				4-22	
	mat muhly	MURI	<i>Muhlenbergia richardsonis</i>	4-22	–
8				4-13	
	cane bluestem	BOBA3	<i>Bothriochloa barbinodis</i>	4-13	–
9				0-13	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0-13	–
10				4-13	
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	4-13	–
Shrub/Vine					
11				4-13	
	pricklypear	OPUNT	<i>Opuntia</i>	4-13	–
12				4-13	
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	4-13	–
13				4-22	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	4-22	–
	snakewood	CONDA	<i>Condalia</i>	4-22	–
	crown of thorns	KOSP	<i>Koeberlinia spinosa</i>	4-22	–
14				4-13	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	4-13	–
Forb					
15				22-36	
	dwarf desertpeony	ACNA2	<i>Acourtia nana</i>	22-36	–
	milkvetch	ASTRA	<i>Astragalus</i>	22-36	–
	croton	CROTO	<i>Croton</i>	22-36	–
	bladderpod	LESQU	<i>Lesquerella</i>	22-36	–
	Russian thistle	SAKA	<i>Salsola kali</i>	22-36	–
16				4-22	
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	4-22	–

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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Table 9. Community 5.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 6.1 plant community composition

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

This range site provides habitats which support a resident animal community that is characterized by pronghorn antelope, coyote, black-tailed jackrabbit, bannertail kangaroo rat, sparrow hawk, scaled quail, loggerhead shrike, horned lark, meadowlark, roadrunner, Couchs spadefoot toad, Texas horned lizard and prairie rattlesnake.

Hydrological functions

Hydrologic Interpretations Soil Series Hydrologic Group Belen D Caticon C Elbutte D Harkey B Keno D Mimbres B Ubar D Vekol D Steller C Runoff Curve Numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups.

Recreational uses

Recreation potential is limited largely by the hot daytime temperatures of summer and windy spring weather of the lower Sonoran Life Zone, within which the site is located. 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 season. 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

Grazing: This site is suitable for grazing in all seasons of the year, Although most of the green forage is produced during the summer months. This site is suitable for grazing by cattle, sheep, goats, and horses. Retrogression caused by inadequately managed grazing results in black grama, cane bluestem, alkali sacaton, and vine-mesquite being replaced by such plants as broom snakeweed and tobosa. As advanced deterioration takes place, tobosa gives way primarily to burrograss while tarbush, and mesquite may invade. Recovery at this stage is very slow unless the competing woody species are controlled and good grazing management is practiced.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month Similarity Index Ac/AUM 100 - 76 6.6 – 7.5 75 – 51 7.1 – 10.0 50 – 26 9.6 – 15.0 25 – 0 15.0 - +

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:

Stellar sandy clay loam, silty clay loam

Brenda gravelly clay loam

Continental 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:
