

Ecological site R042CY154NM

Swale

Last updated: 10/21/2024
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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.

Ecological site concept

This site occurs in concave or depressional positions of valleys along drainageways or as sinkholes. As such, it receives significant runoff from adjacent sites. Slopes vary from 0 to 4 percent. The soils on this site are very deep and well-drained. Surface textures are loam, very fine sandy loam, silt loam, and silty clay loam. Subsurface textures are silt loam and silty clay loam.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Bouteloua curtipendula</i> (2) <i>Bouteloua gracilis</i>

Physiographic features

This site occurs in concave or depressional positions of valleys along drainageways or as sinkholes. This site receives significant runoff from adjacent sites to increase the effective moisture. This site transports water from higher, upland sites to lower, bottomland sites. Slopes vary from 0 to 4 percent. Direction of slope varies and is not significant. Elevations range from 4,000 to 7,000 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Depression (2) Valley floor
Elevation	1,220 – 2,130 m
Slope	0 %
Aspect	Aspect is not a significant factor

Climatic features

The climate of this area is "semi-arid continental."

Annual average precipitation ranges from 11 to 19 inches. Variations of 5 inches, more or less, are not uncommon. Approximately 70 percent of the precipitation occurs from May through October. Most of the summer rain comes in the form of high-intensity, short-uration thunderstorms. Winter moisture is usually negligible.

Temperatures are characterized by distinct seasonal changes and large annual and dirnal temperature changes. The average annual temperature ranges from 55 degrees F to 60 degrees F, with extremes of 20 degrees F below zero in the winter to 110 degrees F in the summer not uncommon.

The average frost-free season is 170 to 189 days. The last killing frost is in early April and the first killing frost is in mid October.

Both temperature and precipitation favor a warm-season perennial plant community. However, because of the position of this site, water and cold air drainage, conditions are good for an important cool season component on this site. Winds that blow from the west and southwest from February through June tend to dry the soil during a critical period for cool season plant growth.

Climate data was obtained from <http://www.wrcc.sage.dri.edu/summary/climsmnm.html> web site. Data interpreted utilizing NM NRCS Climate Summarizer spreadsheet.

Table 3 Representative climatic features

Frost-free period (average)	190 days
Freeze-free period (average)	210 days
Precipitation total (average)	480 mm

Influencing water features

This is an upland site, and is not associated with water features or wetlands. During heavy rain events, this site may receive run-on moisture from landforms above and contribute runoff to landforms below.

Soil features

The soils on this site are very deep and well-drained. The surface textures are loam, very fine sandy loam, silt loam, and silty clay loam. Subsurface textures are silt loam and silty clay loam. Permeability is moderate to slow and water-holding capacity is high. The effective rooting depth is 60 inches or more. These soils, once wetted, can store water for relatively long periods. Soil blowing hazard is moderate and water erosion hazard could be severe. Organic matter in the surface soil is significant for this area.

Table 4. Representative soil features

Surface texture	(1) Silt loam (2) Loam (3) Fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Very slow to moderate
Soil depth	150 – 180 cm

Surface fragment cover <=3"	0 – 20 %
Available water capacity (0-101.6cm)	22.86 – 30.48 cm
Soil reaction (1:1 water) (0-101.6cm)	6.6 – 7.8
Subsurface fragment volume <=3" (Depth not specified)	0 – 30 %

Ecological dynamics

This site is associated with Limestone Hills, Very Shallow and Bottomland sites. The Swale site occurs along drainageways of intermittent streams, flanked by Limestone Hills or Very Shallow sites. This site receives and transports water from these higher upland sites to lower Bottomland sites. The aspect of this site is grassland with a few shrubs scattered throughout. production and composition can vary considerably with elevation. Dominant grasses of the historic plant community include blue grama, sideoats grama, tobosa, western wheatgrass, and vine mesquite. This site is subject to encroachment by woody species, such as juniper, littleleaf sumac, and Apache plume. Wind dispersal of Apache plume seed, and dispersal of juniper and littleleaf sumac fruits by birds and other wildlife may be important in facilitating the encroachment of these shrubs. Fire suppression may also contribute to shrub encroachment. This site is also susceptible to erosion caused by flood events, loss of grass cover, or a combination of the two.

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				90-628	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	90-628	–
2				179-359	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	179-359	–
3				359-538	
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	359-538	–
4				179-359	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	179-359	–
5				179-359	
	vine mesquite	PAOB	<i>Panicum obtusum</i>	179-359	–
6				90-269	
	cane bluestem	BOBA3	<i>Bothriochloa barbinodis</i>	90-269	–
	silver bluestem	BOSA	<i>Bothriochloa saccharoides</i>	90-269	–
7				179-269	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	179-269	–
	big sacaton	SPWR2	<i>Sporobolus wrightii</i>	179-269	–

8				54-90	
	threeawn	ARIST	<i>Aristida</i>	54-90	–
9				54-90	
	dropseed	SPORO	<i>Sporobolus</i>	54-90	–
10				90-179	
	Hall's panicgrass	PAHA	<i>Panicum hallii</i>	90-179	–
11				54-90	
	mat muhly	MURI	<i>Muhlenbergia richardsonis</i>	54-90	–
	burrograss	SCBR2	<i>Scleropogon brevifolius</i>	54-90	–
12				54-90	
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	54-90	–
Forb					
13				17-34	
	buckwheat	ERIOG	<i>Eriogonum</i>	18-36	–
14				17-56	
	sagebrush	ARTEM	<i>Artemisia</i>	18-54	–
15				17-34	
	verbena	VEPO4	<i>Verbena polystachya</i>	18-36	–
16				17-56	
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	18-54	–
Shrub/Vine					
17				56-90	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	54-90	–
18				56-90	
	catclaw acacia	ACGR	<i>Acacia greggii</i>	54-90	–
19				90-146	
	Apache plume	FAPA	<i>Fallugia paradoxa</i>	90-143	–
20				56-90	
	yucca	YUCCA	<i>Yucca</i>	54-90	–
21				56-90	
	Shrub, deciduous	2SD	<i>Shrub, deciduous</i>	54-90	–

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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Inventory data references

Data collection for this site was done in conjunction with the progressive soil surveys within the Pecos-Canadian Plains and Valleys (MLRA 70) Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Otero, Eddy, Chaves, Lincoln.

Other references

Data collection for this site was done in conjunction with the progressive soil surveys within the Pecos-Canadian Plains and Valleys 70 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Otero, Eddy, Chaves, Lincoln.

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5. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheet. Rangeland Soil Quality—Aggregate Stability. Rangeland Sheet 3, [Online]. Available: <http://www.statlab.iastate.edu/survey/SQL/range.html>
6. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheet. Rangeland Soil Quality—Organic Matter. Rangeland Sheet 6, [Online]. Available: <http://www.statlab.iastate.edu/survey/SQL/range.html>

Characteristic Soils Are:

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Approval

Kendra Moseley, 10/21/2024

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	09/13/2026
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:
