

Ecological site R070AY006NM

Swale

Last updated: 9/12/2023

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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 ephemeral drainageways and swales, where soils receive significant run-on moisture. Soils are deep to very deep; and are fine-loamy, fine-silty, or fine. This site correlates to the Run-on ecological site group.

Similar sites

GX070A01X008	Ephemeral Drainageways The Ephemeral Drainageways site applies to swales and ephemeral drainageways in LRU 70A.1
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Table 1. Dominant plant species

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

Physiographic features

This site occurs on concave, nearly level to gently sloping swales and depressions. These sites receive significant amounts of runoff, from adjoining sites, that increase the effective moisture with an increase in plant production. Slopes are generally 0 to 3 percent but may range to 5 percent. Elevation ranges from 5,000 to 7,500 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Swale (2) Depression (3) Basin-floor remnant
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional

Ponding frequency	None
Elevation	1,520 – 2,290 m
Slope	0 – 10 %
Aspect	Aspect is not a significant factor

Climatic features

The climate of this area can be classified as “semi-arid continental”.

Precipitation averages 14 to 16 inches. Seventy seven percent of the year’s moisture normally falls during the period of May through October. Practically all of it is brought by brief afternoon and evening thunderstorms. In July and August normally the wettest months of the year, one can expect about one day in five when rainfall exceeds one-tenth inch. Early spring precipitation in May benefits the cool-season plants. Winter precipitation, supplying 24 percent of the year’s moisture, normally has no more than two days a month with as much as one-tenth inch of moisture. Much of the winter precipitation falls as snow.

Air temperatures vary from a monthly mean of 20 degrees F in January to 69 degrees F in July. Daily high temperatures average in the 80’s and low 90’s during the summer. Winter low temperatures fall below the freezing mark much of the time from November through March with minimum temperatures approaching 25 degrees F below zero. Dates of the last killing frost may vary from May 9th through May 17th, and the first killing frost from September 27th to October 8th. The frost-free season ranges from 141 days to 153 days from early May to early October.

Wind velocities for the area average 10 to 12 miles per hour and prevail from the south and southwest. Generally, March is the windiest month. Strong winds during the spring cause rapid drying of the soil surface.

Nearby mountains to the west intercept much of the precipitation from the Pacific storms coming through this area during the winter. About 70 percent of the 14 to 16 inches of annual precipitation falls in the form of rainfall during the frost-free season. About 40 percent of the annual precipitation benefits cool-season plants, 50 percent benefits warm-season plants, and 10 percent falls during the season of plant dormancy. Relative humidity is moderately low. The sun shines approximately 75 percent of the time.

Climate data was obtained from <http://www.wrcc.sage.dri.edu/summary/climsmnm.html> web site using 50 percent probability for freeze-free and frost-free seasons using 28.5 degrees F and 32.5 degrees F, respectively.

Table 3 Representative climatic features

Frost-free period (average)	150 days
Freeze-free period (average)	170 days
Precipitation total (average)	410 mm

Influencing water features

This site is not influenced by water from a wetland or stream.

Soil features

Soils are deep to very deep. Surface textures are fine sandy loam, loam, or silty clay loam. The subsoils texture is a loam, clay loam, or silty clay loam. Permeability is moderately slow to slow. Available water-holding capacity is high. Rooting depth is 40 to 60 inches, or more. The air-water relationship is favorable for plant growth. Runoff is low.

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

Characteristic soils:

La Brier

Manzano

Vermejo

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam (2) Loam (3) Sandy clay loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to moderate
Soil depth	150 – 200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	22.86 – 30.48 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 20 %
Electrical conductivity (0-101.6cm)	0 – 80 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	Not specified

Soil reaction (1:1 water) (0-101.6cm)	7.2 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

Major ecological drivers on this site are grazing and hydrology.

Text from the Grazing Section that is relevant to plant ecology:

Approximately 95 percent of the annual yield is from species that furnish forage for grazing animals. Continuous yearlong grazing or continual grazing during the potential growing season (April through October) by livestock will result in a plant community dominated by blue grama. Spring rest benefits western wheatgrass and forbs. Summer rest will benefit vine mesquite. Winter rest will benefit fourwing saltbush and fall rest will allow warm-season plants to mature.

State and transition model

Figure 3. Generalized STM for run-on sites in 70A

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1				404-504	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	404-504	–
2				404-504	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	404-504	–
3				404-504	
	vine mesquite	PAOB	<i>Panicum obtusum</i>	404-504	–
4				101-303	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	101-303	–
5				101-303	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	101-303	–
6				101-303	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	101-303	–
7				56-146	
8				11-56	
	saltgrass	DISP	<i>Distichlis spicata</i>	20-61	–
9				22-56	
	mat muhly	MURI	<i>Muhlenbergia richardsonis</i>	20-61	–
10				22-56	

	threeawn	ARIST	<i>Aristida</i>	20-61	–
11				45-101	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	40-101	–
12				0-45	
	creeping muhly	MURE	<i>Muhlenbergia repens</i>	0-40	–
Forb					
13				22-101	
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	20-101	–
14				22-101	
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	20-101	–
15				22-101	
	New Mexico thistle	CINE	<i>Cirsium neomexicanum</i>	20-101	–
16				22-101	
	prairie clover	DALEA	<i>Dalea</i>	20-101	–
17				45-101	
	Forb, annual	2FA	<i>Forb, annual</i>	40-101	–
18				45-101	
	Forb, perennial	2FP	<i>Forb, perennial</i>	40-101	–
Shrub/Vine					
19				0-101	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0-101	–
20				0-56	
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0-61	–
21				0-56	
	ragweed sagebrush	ARFR3	<i>Artemisia franserioides</i>	0-61	–
22				0-56	
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0-61	–

Animal community

Habitat for Wildlife: This site provides habitats which support a resident animal community that is characterized by pronghorn antelope, badger, black-tailed jackrabbit, meadow mole, marsh hawk, sparrow hawk, meadowlark, bullsnake, Great Plains skunk and ornate box turtle.

Hydrological functions

The runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups. Hydrologic Interpretations Soil Series----- Hydrologic Group La Brier----- D Manzano----- B Vermejo----- D

Wood products

This site produces no significant wood products.

Other products

Grazing: Approximately 95 percent of the annual yield is from species that furnish forage for grazing animals. This site can be grazed any season of the year by all classes and kinds of livestock. The variety of species that this site produces provided a good balanced feed and good nutrition for grazing animals. The site will occur as a complex within the adjoining upland units and makes up only a minor portion of the management unit. It can provide a major portion of the forage. Sufficient ground cover and herbage production needs to be maintained or the site will gully and production will be greatly reduced. Continuous yearlong grazing or continual grazing during the potential growing season (April through October) by livestock will result in a plant community dominated by blue grama. A system of deferred grazing, which varies the season of grazing and rest during successive year, is needed to maintain a healthy plant community and the balance between the cool-season species and the warm-season species. Spring rest benefits western wheatgrass and forbs.

Summer rest will benefit vine mesquite. Winter rest will benefit fourwing saltbush and fall rest will allow warm-season plants to mature.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month Similarity Index--- Ac/AUM 100 - 76----- 1.3 – 3.5 75 – 51----- 2.7 – 5.0 50 – 26----- 3.4 – 10.8 25 – 0----- 10.8+

Contributors

Christine Bishop
Don Sylvester
Elizabeth Wright
John Tunberg

Approval

Kendra Moseley, 9/12/2023

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	09/25/2026
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:
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17. Perennial plant reproductive capability:
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