USDA Natural Resources
Conservation Service

Ecological site R070AY006NM
Swale

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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.

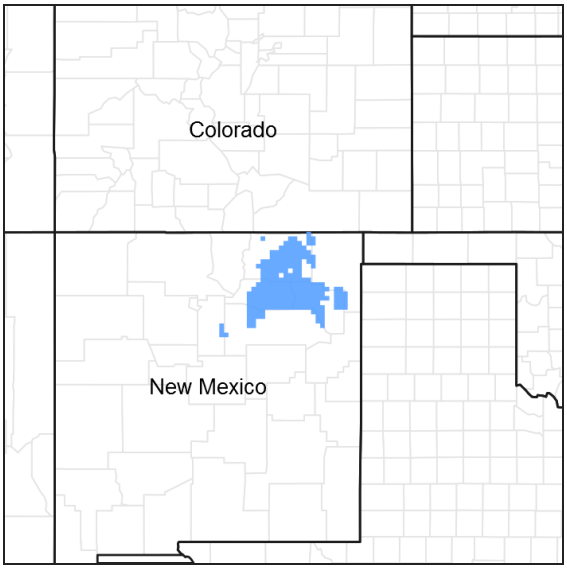

Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

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

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Pascopyrum smithii* (2) *Bouteloua gracilis*

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	1,524–2,286 m
Slope	0–5%
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)	149 days
Freeze-free period (average)	171 days
Precipitation total (average)	406 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	152–203 cm
Surface fragment cover <=3"	0–3%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	22.86–30.48 cm
Calcium carbonate equivalent (0-101.6cm)	2–15%
Electrical conductivity (0-101.6cm)	0–84 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–4
Soil reaction (1:1 water) (0-101.6cm)	7.2–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–3%
Subsurface fragment volume >3" (Depth not specified)	0%

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

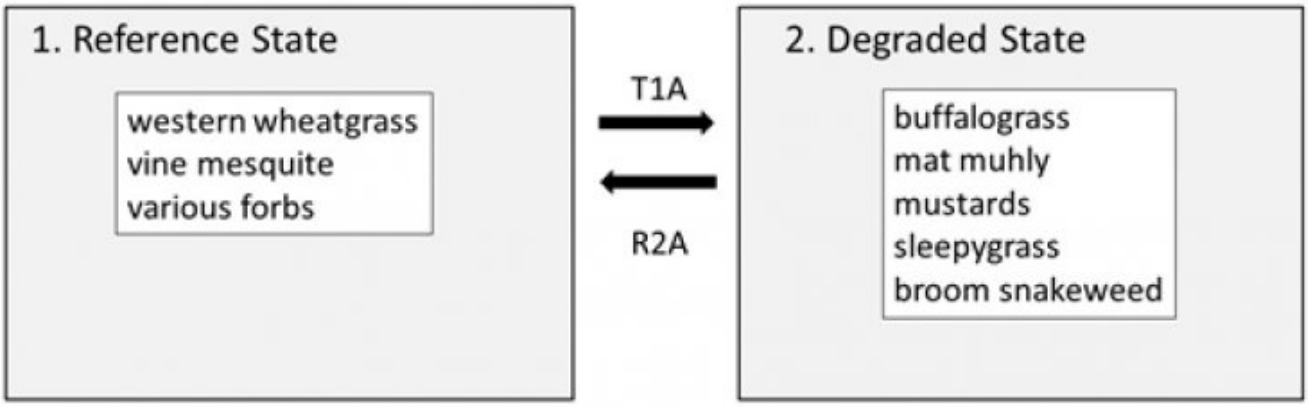

Figure 4. Generalized STM for run-on sites in 70A

State 1
Reference State

Community 1.1
Reference Plant Community

This site is a grassland with an occasional shrub. Mid-grasses such as western wheatgrass, alkali sacaton and sideoats grama are dominant, with short-grasses and a variety of forbs. Grasses, with forbs and shrubs making up a minor portion of the plant community, dominate this site. It occurs in the narrow elongated drainages that transport surface runoff from adjoining upland sites to the bottomlands. Because this site receives additional water, the plant community produces more than the adjoining sites.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1042	1715	2376
Forb	123	202	280
Shrub/Vine	56	101	135
Total	**1221**	**2018**	**2791**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	5%

Grass/grasslike foliar cover	35%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	10%
Surface fragments >0.25" and <=3"	0-3%
Surface fragments >3"	0-3%
Bedrock	0%
Water	0%
Bare ground	50%

Figure 6. Plant community growth curve (percent production by month). NM3706, R070AY006NM Swale HCPC. R070AY006NM Swale HCPC Grassland with a minor forb and shrub component..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	5	10	10	25	30	12	5	0	0

State 2
Degraded

This state represents a plant community dominated by blue grama.

Transition T1A
State 1 to 2

Transition resulting from continuous grazing--either year-round or season-long.

Restoration pathway R2A
State 2 to 1

Restoration pathway resulting from the implementation of prescribed grazing.

Conservation practices

Grazing Management Plan - Applied

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				404–504	
	western wheatgrass	PASM	*Pascopyrum smithii*	404–504	–
2				404–504	
	blue grama	BOGR2	*Bouteloua gracilis*	404–504	–
3				404–504	
	vine mesquite	PAOB	*Panicum obtusum*	404–504	–
4				101–303	
	James' galleta	PLJA	*Pleuraphis jamesii*	101–303	–
5				101–303	

5				101–303	
	alkali sacaton	SPAI	*Sporobolus airoides*	101–303	–
6				101–303	
	sideoats grama	BOCU	*Bouteloua curtipendula*	101–303	–
7				56–146	
8				11–56	
	saltgrass	DISP	*Distichlis spicata*	20–61	–
9				22–56	
	mat muhly	MURI	*Muhlenbergia richardsonis*	20–61	–
10				22–56	
	threeawn	ARIST	*Aristida*	20–61	–
11				45–101	
	squirreltail	ELEL5	*Elymus elymoides*	40–101	–
12				0–45	
	creeping muhly	MURE	*Muhlenbergia repens*	0–40	–
Forb					
13				22–101	
	upright prairie coneflower	RACO3	*Ratibida columnifera*	20–101	–
14				22–101	
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	20–101	–
15				22–101	
	New Mexico thistle	CINE	*Cirsium neomexicanum*	20–101	–
16				22–101	
	prairie clover	DALEA	*Dalea*	20–101	–
17				45–101	
	Forb, annual	2FA	*Forb, annual*	40–101	–
18				45–101	
	Forb, perennial	2FP	*Forb, perennial*	40–101	–
Shrub/Vine					
19				0–101	
	fourwing saltbush	ATCA2	*Atriplex canescens*	0–101	–
20				0–56	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–61	–
21				0–56	
	ragweed sagebrush	ARFR3	*Artemisia franserioides*	0–61	–
22				0–56	
	winterfat	KRLA2	*Krascheninnikovia lanata*	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

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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	05/12/2025
Approved by	Kendra Moseley
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:

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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:**
