

Ecological site R077BY007NM

Swales

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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.

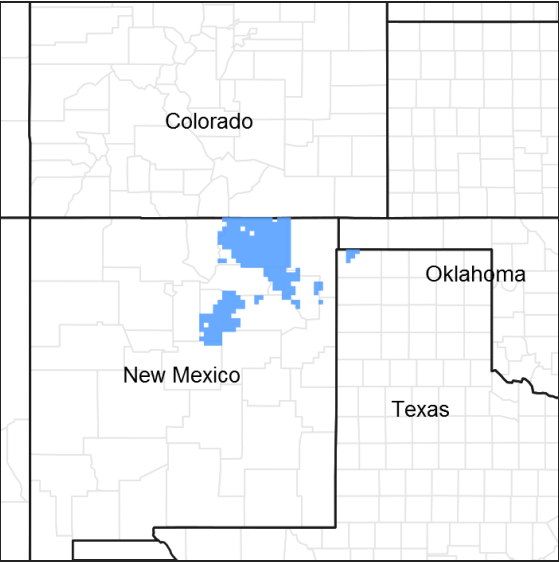


Figure 1. Mapped extent

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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs as lower lying drainageways, playa lakes, or other depressional areas where moisture accumulates as a result of runoff from the surrounding higher sites. This site receives significant amounts of runoff from the adjacent sites that increases the effective moisture with an increase in the plant production. Slopes generally range from 0 to 3 percent but may range up to 5 percent. Elevation ranges from 4,300 feet to 7,500 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Drainageway (2) Playa
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional

Elevation	1,311–2,286 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 from about 15 to 16 inches annually with approximately 75 percent of this yearly moisture falling during the period of May through October. Most summer rainfall is associated with usually brief afternoon and evening thundershowers, which occasionally produce heavy rain over a small area, and sometimes bring a little hail. Winters are generally dry, with only one or two days a month when as much as one-tenth inch of moisture falls. However, winter average 20 inches of snow, although most snowfalls are light with an occasional storm producing up to six inches. Following these storms, snow may lie on the ground for several days and occasionally moderate to strong winds accompanying these storms result in blizzard conditions and heavy drifting. Although the precipitation patterns favor the production of warm-season plants, sufficient moisture is received in the late winter and the spring to support cool-season plants. Approximately 25 percent of the annual precipitation is received during April and May. May is generally the wettest month followed by July and then August.

Temperatures show the seasonal changes and large annual and diurnal ranges characteristic of such a climate. Summers are generally mild. The high daily temperature reading exceed 90 degrees F about one-third of the time, and readings of 100 degrees F occur about once a year. Rapid cooling after sundown results in minimum temperatures below 60 degrees F on most nights, even in midsummer. Winter shade temperatures usually rise to the mid-40's and an average of only 15 days fail to see temperatures rise above the freezing mark most of the time from early November through March; below zero readings occur on an average of only three times a year.

The freeze-free season ranges from 168 days to 171 days between April 28th to October 16th. Both temperatures and annual precipitation favor warm-season plants. About 40 percent of the annual precipitation is received during the season where temperatures will benefit cool-season plants and only 10 percent falls during the dormant season.

While open to winter invasions of arctic air over the Great Plains, this area is far enough south and west to miss many of these outbreaks. Mountains to the north and west intercept much of the precipitation from the Pacific northwest storms coming through this area during the winter. An average hourly wind velocity for the year is 15 miles per hour. Somewhat higher winds prevail during the spring months, but velocities exceeding 24 mile per hour are experienced only 10 percent of the usual year. Stronger winds blow chiefly from a westerly or southwesterly direction during the spring. Relative humidity is moderately low.

Climate data was obtained from <http://www.wrcc.sage.dri.edu/summary/climsmnm.html> web site using 50% 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)	191 days
Freeze-free period (average)	220 days
Precipitation total (average)	406 mm

## Influencing water features

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

## Soil features

These soils are deep, moderately and well drained. Surface textures are fine sandy loam, loam, silty clay loam, clay loam or clay. The subsurface textures are loam, clay loam, silty clay loam or clay. Permeability is moderately slow to slow. The available water-holding capacity is high. Rooting depth is from 30 to 60 inches or more. The soil and

water plant relationship is favorable for plant growth.

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam (2) Loam (3) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Slow to moderately slow
Soil depth	76–183 cm
Available water capacity (0-101.6cm)	22.86–30.48 cm
Electrical conductivity (0-101.6cm)	0–8 mmhos/cm
Soil reaction (1:1 water) (0-101.6cm)	6.6–9

Ecological dynamics

State and transition model

Ecosystem states

1. Historic Climax Plant Community

State 1 submodel, plant communities

1.1. Historic Climax Plant Community

State 1  
Historic Climax Plant Community

Community 1.1  
Historic Climax Plant Community

Historic Climax Plant Community This site is a mixed mid grass plant community with an occasional shrub. Warm-season mid grasses and short grasses dominate the site; however, cool-season grasses and forbs are an important component and can make up to 30 to 35 percent of the plant community. Woody species are a minor component of the plant community. This site occurs in the narrow elongated drainages that transport surface runoff from the adjacent upland sites to the bottomland. Because this site receives additonal water, the plant community produces a greater amount than the adjoining sites. Other grasses that could appear on this site include: bottlebrush squirreltail, mat muhly, creeping muhly, threeawn spp., inland saltgrass, sand dropseed, and ring muhly. Other shrubs include: skunkbush sumac, broom snakeweed, and groundsel. Other forbs include: western ragweed, New Mexico thistle, astragalus spp., buckwheat spp., scrufpea, feted marigold, and globemallow spp.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1395	2326	3256
Forb	135	224	314
Shrub/Vine	50	84	118
<b>Total</b>	<b>1580</b>	<b>2634</b>	<b>3688</b>

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	1%
Grass/grasslike foliar cover	30-35%
Forb foliar cover	2-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	30-35%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	20-25%

Figure 5. Plant community growth curve (percent production by month). NM4707, R077BY007NM Swales Reference State. R077BY007NM Swales Reference State.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	3	6	8	10	25	30	15	1	0	0

### Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Western Wheatgrass</b>			560–701	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	560–701	–
2	<b>Blue Grama</b>			560–701	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	560–701	–
3	<b>Vine-mesquite</b>			560–701	
	vine mesquite	PAOB	<i>Panicum obtusum</i>	560–701	–
4	<b>Sideoats Grama</b>			140–280	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	140–280	–
5	<b>Galleta</b>			140–280	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	140–280	–
6	<b>Alkali Sacaton</b>			84–140	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	84–140	–
7	<b>Buffalograss</b>			84–140	
8	<b>Little Bluestem</b>			84–140	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	84–140	–
9	<b>Switchgrass</b>			84–140	
	switchgrass	PAVI2	<i>Panicum virgatum</i>	84–140	–
10	<b>Other Grasses</b>			84–140	
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	84–140	–
	buckwheat	ERIOG	<i>Eriogonum</i>	24–57	–
<b>Forb</b>					
11	<b>Prairie Coneflower, Prairie Clover spp., Annual Sun</b>			28–140	
	prairie clover	DALEA	<i>Dalea</i>	28–140	–
	common sunflower	HEAN3	<i>Helianthus annuus</i>	28–140	–
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	28–140	–
12	<b>Annual Forbs</b>			84–140	
	Forb, annual	2FA	<i>Forb, annual</i>	84–140	–
13	<b>Perennial Forbs</b>			84–140	
	Forb, perennial	2FP	<i>Forb, perennial</i>	84–140	–
<b>Shrub/Vine</b>					
14	<b>Fringed Sagewort, Winterfat, Fourwing Saltbush</b>			0–140	
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0–140	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0–140	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0–140	–
15	<b>Other Shrubs</b>			0–140	
	Shrub, deciduous	2SD	<i>Shrub, deciduous</i>	0–140	–

## Animal community

Habitat for Wildlife:

No Data

## Hydrological functions

The runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups.

Soil Series-----	Hydrologic Group
La Brier-----	D
Bippus-----	C
Manzano-----	B
Vermejo-----	D

## Recreational uses

This site provides limited recreational potential due to the lack of live water and shade. This site provides poor camping, hiking, and picnicking. Hunting for antelope and rabbits is good and hunting for upland game birds is fair to good. The natural beauty of this site is enhanced by the variety of plants that bloom from early spring to early fall.

## Wood products

This site has no significant potential for wood products.

## Other products

Grazing:

This site can be grazed any season of the year by all classes and kinds of livestock. Approximately 95 percent of the annual yield are from species that furnish forage for livestock. The variety of species produced by this site provides a well-balanced feed and good nutrition for grazing animals during most seasons of the year. Continuous yearlong grazing or grazing continually during the period from April through October will result in a plant community of low forage value such as galleta and broom snakeweed. Sufficient ground cover and herbage production needs to be maintained or the site will gully and the production of the site will be greatly reduced. A system of deferred grazing, which varies the season of grazing and rest during successive years, is needed to maintain or improve the plant community. Fall and winter rest will benefit western wheatgrass and bottlebrush squirreltail. Summer rest will benefit vine-mesquite, blue grama, and sideoats grama.

## 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-----	2.6 – 5.0
50 – 26-----	3.3 – 10.0
25 – 0-----	10.0+

## Type locality

Location 1: Colfax County, NM
Location 2: Harding County, NM
Location 3: Union County, NM

## Other references

Data collection for this site was done in conjunction with the progressive soil surveys within the Southern High Plains 77 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Union, Harding Colfax.

## 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:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**
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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):**
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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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