

Ecological site R042BE062NM

Swale, Cool Desert Grassland

Accessed: 04/30/2024

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 on on channeled valley bottom terraces, alluvial fans and piedmont slopes and other low-lying landscapes that receive additional run-on from adjacent sites. Slopes range from 0 to 5 percent. Elevations range from 4,500 to 5,500 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Stream terrace (2) Swale (3) Alluvial fan
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Rare to occasional
Ponding frequency	None
Elevation	1,372–1,676 m
Slope	0–5%
Aspect	Aspect is not a significant factor

Climatic features

This site has an arid climate with distinct seasonal temperature variations and large annual and diurnal temperature changes characteristic of a continental climate.

Precipitation averages 8 to 10 inches annually. Deviations of 4 inches or more from the average are quite common. Fifty percent of the precipitation is received from July to November, which is the predominant growing season of native plants. Summer precipitation is characterized by high-intensity, short-duration rainstorms. Winter precipitation averages less than one-half inch per month, usually in the form of rain. There are occasional snowstorms of short duration.

Temperatures vary from a mean monthly average of 77 F in July to 34 F in January, with a maximum of 104 F and a minimum of -10 F. The average last killing frost in spring is April 15, and the average first killing frost in fall is

October 28. Frost-free season averages 185 days. Temperatures are conducive to native grass and forb growth from March through November.

Spring winds of 15 to 40 miles per hour are common from February to June. These winds increase transpiration rates of native plants and rapidly dry the surface soil. Small soil particles are often displaced by the wind near the soil surface. This results in structural damage to native plants, especially young seedlings.

Due to the low-lying position of the landscape and the resulting run-on, the soil moisture is more effective than on adjacent sites. This results in early green-up and higher productivity.

Climate data was obtained from <http://www.wrcc.sage.dri.edu/summary/climsmnm.html> 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)	165 days
Freeze-free period (average)	213 days
Precipitation total (average)	254 mm

Influencing water features

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

Soil features

The soils are moderately deep to deep. Surface textures range from loam, clay loam, silty clay loam and some clay. Substratum textures are very fine sandy loam, silt loam, clay loam, or silty clay loam. Calcium carbonate equivalent ranges from 0 to 15 percent

Depth to free carbonates - 0 to 20 inches.

Table 4. Representative soil features

Surface texture	(1) Loam (2) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Slow to moderate
Soil depth	183 cm
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	17.78 cm
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–2
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–5%

Subsurface fragment volume >3" (Depth not specified)	0%
---	----

Ecological dynamics

This is a grassland site with shrubs scattered throughout. Trees are not commonly found on this site. Forbs comprise an important component on this site.

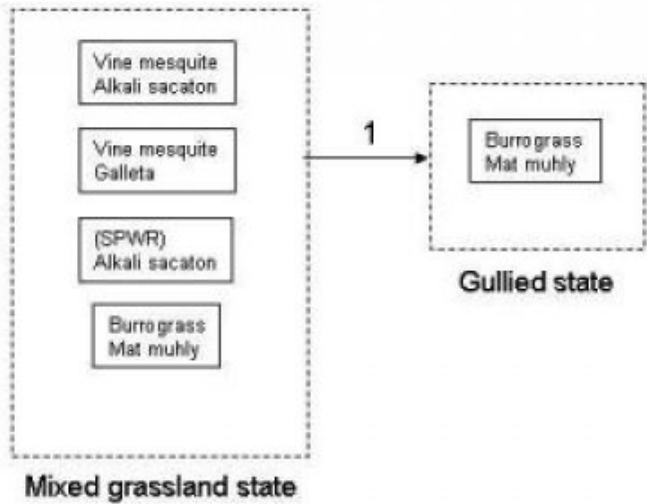
Other grasses that could appear on this site include: western wheatgrass, mat muhly, cane bluestem, sideoats grama, black grama, and Indian ricegrass.

Other woody plants include broom snakeweed and yucca spp.

Other forbs include: whorled milkweed, thistle spp., verbena spp., and spurge spp.

State and transition model

State-Transition model: MLRA 42, SD-1: Swale



**State 1
Historic Climax Plant Community**

**Community 1.1
Historic Climax Plant Community**

This is a grassland site with shrubs scattered throughout. Trees are not commonly found on this site. Forbs comprise an important component on this site. Other grasses that could appear on this site include: western wheatgrass, mat muhly, cane bluestem, sideoats grama, black grama, and Indian ricegrass. Other woody plants

include broom snakeweed and yucca spp. Other forbs include: whorled milkweed, thistle spp., verbena spp., and spurge spp.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	656	1236	1816
Shrub/Vine	37	68	101
Forb	37	68	101
Total	730	1372	2018

Table 6. Ground cover

Tree foliar cover	6%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	40%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	20%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	40%

Figure 5. Plant community growth curve (percent production by month). NM2311, R042XA062NM-Swale Warm Season Plant- HCPC. SD-1 Swale HCPC Warm Season Plant Community.

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

Figure 6. Plant community growth curve (percent production by month). NM2312, R042XA062NM-Swale Cool Season Plant-HCPC. SD-1 Swale HCPC Cool Season Plant Community.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	5	20	15	5	5	5	5	10	15	15	0

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	Warm Season			206–343	
	vine mesquite	PAOB	<i>Panicum obtusum</i>	206–343	–
2	Warm Season			206–343	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	206–343	–
	tobosagrass	PLMU3	<i>Pleuraphis mutica</i>	206–343	–
3	Warm Season			206–343	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	206–343	–
	big sacaton	SPWR2	<i>Sporobolus wrightii</i>	206–343	–
4	Warm Season			96–165	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	96–165	–
5	Cool Season			68–110	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	68–110	–
6	Warm Season			13–41	
	burrograss	SCBR2	<i>Scleropogon brevifolius</i>	13–41	–
7	Warm Season			41–96	
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	41–96	–
Shrub/Vine					
8	Shrub			13–41	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	13–41	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	13–41	–
9	Shrub			0–41	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	0–41	–
	rubber rabbitbrush	ERNAN5	<i>Ericameria nauseosa</i> ssp. <i>nauseosa</i> var. <i>nauseosa</i>	0–41	–
	Apache plume	FAPA	<i>Fallugia paradoxa</i>	0–41	–
	littleleaf sumac	RHMI3	<i>Rhus microphylla</i>	0–41	–
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	0–41	–
Forb					
10	Forb			68–138	
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	68–138	–
	broadleaf milkweed	ASLA4	<i>Asclepias latifolia</i>	68–138	–
	leatherweed	CRPOP	<i>Croton pottsii</i> var. <i>pottsii</i>	68–138	–
	Russian thistle	SAKA	<i>Salsola kali</i>	68–138	–
	ragwort	SENEC	<i>Senecio</i>	68–138	–
	American black nightshade	SOAM	<i>Solanum americanum</i>	68–138	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	68–138	–

Animal community

This site provides habitats which support a resident animal community that is characterized by coyote, desert cottontail, silky pocket mouse, horned lark, ornate box turtle, New Mexico whiptail, and prairie rattlesnake.

Hydrological functions

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

Hydrologic Interpretations
Soil Series Hydrologic Group
Mimbres C
Largo b

Recreational uses

This site is not normally considered for its recreational value other than for nature observation, hunting, and horseback riding. The beauty of this site may be enhanced by its proximity to a colorful setting.

Wood products

This site has no potential for wood products in its potential plant community.

Other products

Approximately 90 percent of the production on this site is suitable for grazing or browsing by domestic livestock and wildlife. Grazing pressure on adjacent sites may be a problem since grazing animals are attracted to this site because of early green-up. Heavy grazing pressure during early green-up, as well as trampling damage on wet soils may lead to deterioration of the potential plant community. Such deterioration is indicated by a decrease in vine mesquite, blue grama, bottlebrush squirreltail, and desirable forbs. Plants that increase include burrograss, mat muhly, broom snakeweed, and threadleaf groundsel.

A planned grazing system with periodic deferment is best to maintain the desirable balance between plant species and to maintain the natural productivity and plant vigor.

Removal of the previous year's growth, either by grazing or by prescribed burning, will remove old plant growth and lead to increased production and palatability of the coarser grasses found on this site.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index-----Ac/AUM

100 - 76-----1.9 - 2.3

75 - 51-----2.2 - 3.5

50 - 26-----3.3 - 7.0

25 - 0-----7.0 +

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 Area 42, of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: Valencia and Bernalillo.

Characteristic Soils Are:

Mimbres silt loam

Largo

Contributors

Brandon Bestelmeyer

Don Sylvester

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:**
