USDA Natural Resources
Conservation Service

Ecological site R042CY118NM
Salty Bottomland

Last updated: 10/21/2024
Accessed: 01/22/2026

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.

MLRA notes

Major Land Resource Area (MLRA): 042C–Central New Mexico Highlands

Major Land Resource Area (MLRA): 070C–Central New Mexico Highlands

Major Land Resource Area (MLRA) 70C - will become 42C - is a high elevation portion of central New Mexico that is the convergence of four major physiographic provinces: Basin and Range, Southern Rocky Mountains, Great Plains, and Colorado Plateau. As such, it contains parts or characteristics of each, though tectonically, as a region, it is the easternmost extent of the Basin and Range Province and, more specifically, a structural expression of the Rio Grande Rift. It consists mostly of rangeland with some forested areas associated with numerous disconnected mountain ranges such as the Guadalupe, Sacramento, and Manzano Mountains. Other major physiographic features include the Galisteo Basin or the enclosed Estancia Basin, the structural Chupadera and Glorieta Mesas, and the piedmonts of the Buchanan and Guadalupe Mesas.

Ecological site concept

This site occurs on the bottoms of ephemeral drainageways. Soils are very deep and well-drained, although they do receive periodic flooding. Textures are variable, but particle size classes are usually fine loamy or fine. Salinity is somewhat elevated, with EC values

ranging from 2 to 4 mmhos/cm. As such, "Salty" seems an exaggeration.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex canescens* (2) *Atriplex cordifolia*
Herbaceous	(1) *Sporobolus airoides* (2) *Sporobolus wrightii*

Physiographic features

This site occurs in the bottoms of broad major drainageways that receive additional runoff from surrounding uplands on a regular basis. Slopes range from 0 to 5 percent. Direction of slope varies but is not significant. Elevations ranges from 4,600 to 7,000 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Drainageway (2) Valley floor
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Occasional to frequent
Elevation	1,402–2,134 m
Slope	0–5%
Aspect	Aspect is not a significant factor

Climatic features

The climate of the area is “semi-arid continental.”

The average annual precipitation ranges from 13 to 16 inches. Variations of 5 inches, more or less, are not uncommon. Seventy-five percent of the precipitation falls from April to October. Most of the summer precipitation comes in the form of high-intensity, short-duration thunderstorms.

Distinct seasonal changes and large annual and diurnal temperature changes characterize temperatures. The average annual temperature is about 50 degrees F with extremes of -29 degrees F in the winter and 103 degrees F in the summer.

The average frost-free season is 130 to 160 days. The last killing frost falling in early May and the first killing frost in early October.

Both temperature and precipitation favor warm-season perennial plant growth. However, approximately 40 percent of the precipitation also falls at a time favorable for cool-season plant growth. This allows cool-season species to occupy an important component on this site. The effective precipitation of this site is increased, due to its position on the landscape, by runoff from adjoining sites. This site also serves as a cold air drainageway. These two factors are both favorable to cool-season species and also increase the variety and production of the vegetative community. Strong winds from the west and southwest blow across the area from February to June and rapidly dries the soil during a critical period for plant growth.

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)	173 days
Freeze-free period (average)	187 days
Precipitation total (average)	406 mm

Influencing water features

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

*Note regarding the legacy statement above:
The Physiography section describes this site as occurring on drainageway bottoms. If this is the case, this site would be periodically flooded. Additionally, elevated salinity suggests that this site is subirrigated.

Soil features

The soils on this site are generally very deep and well-drained. They are saline or alkaline. The pH is about 7.9 to 8.4. Surface textures may be loam, clay loam, or silty clay loam. Permeability is slow, and water-holding capacity is moderate to high.

Table 4. Representative soil features

Surface texture	(1) Loam (2) Clay loam (3) Sandy clay loam
Family particle size	(1) Clayey
Drainage class	Well drained

Permeability class	Slow
Soil depth	183 cm
Available water capacity (0-101.6cm)	17.78 cm
Electrical conductivity (0-101.6cm)	2–4 mmhos/cm
Soil reaction (1:1 water) (0-101.6cm)	7.9–8.4

Ecological dynamics

Mismanagement of grazing on this site will cause a decrease of the more palatable grasses and forbs such as vine-mesquite, western wheatgrass, bottlebrush squirreltail, and blue grama. This will also cause an increase in species such as alkali sacaton, giant sacaton, inland saltgrass, and shrubs. Continued deterioration of this site could cause a reduced ground cover and increase erosion that will channel runoff water that would normally spread over the entire site. This further lowers production, and extensive structural erosion control measures may be needed to restore productivity on these severely deteriorated sites. Because of the inherent high productivity of this site, it responds well to a system of grazing that allows use and rest during the growing season. If large enough, this site lends itself well to management as a separate unit.

State and transition model

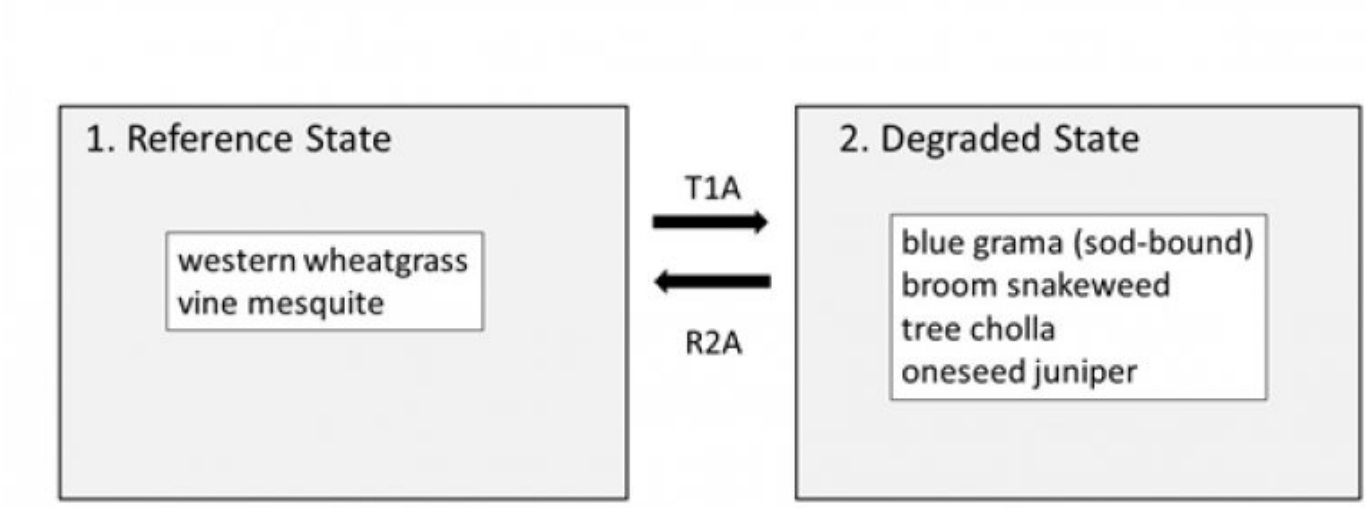

Figure 4. Generalized STM for upland sites. Note that it is not specific to this site.

State 1
Reference Plant Community

Based on the description under Grazing, we expect this community to be rich in palatable grasses such as vine-mesquite, western wheatgrass, bottlebrush squirreltail, and blue grama. Likewise, less-palatable species such as alkali sacaton, giant sacaton, inland saltgrass would not be dominant.

Dominant plant species

- vine mesquite (*Panicum obtusum*), grass
- western wheatgrass (*Pascopyrum smithii*), grass
- blue grama (*Bouteloua gracilis*), grass
- squirreltail (*Elymus elymoides*), grass

Community 1.1
Reference Plant Community

The aspect of this phase is a shrub/grass mixture characterized by mid-grasses. Forbs are minor component of this site. However, during years of abundant winter and spring moisture, forb production can be important. This site occurs in a position which receives surface runoff from surrounding uplands on a regular basis. This additional runoff makes the vegetation noticeably taller and denser than adjacent uplands. Other grasses that could appear on this phase include: creeping muhly, ring muhly, red muhly, black grama, sideoats grama, switchgrass, burrograss, cane and silver bluestem, sand dropseed, wolftail, buffalograss, Indian ricegrass, and Canada wildrye. Other shrubs include: pale wolfberry, fringed sagewort, Apacheplume, ephedra, broom snakeweed, and cacti spp. Other forbs include: New Mexico thistle, desert holly, annual sunflowers, buffalobur, buffalogourd, whorled milkweed, California bricklebush, and tansymustard.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	471	1211	1961
Forb	56	135	224
Total	**527**	**1346**	**2185**

Table 6. Ground cover

Tree foliar cover	0-1%
Shrub/vine/liana foliar cover	5-15%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%

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	30-35%

Figure 6. Plant community growth curve (percent production by month). NM4318, R070CY118NM Salty Bottomland Reference State. R070CY118NM Salty Bottomland Reference State Mixed shrub/mid-grassland and a minor component of forbs. .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	7	10	15	25	25	8	5	0	0

State 2
Degraded

Based on the description under Grazing, we expect this state to dominated by grasses such as alkali sacaton, giant sacaton, and inland saltgrass; as well as by various shrubs. Likewise, vine-mesquite, western wheatgrass, bottlebrush squirreltail, and blue grama would be diminished. This phase occurs where the site has been significantly impacted by grazing, resulting in reduced ground cover and increased erosion.

Dominant plant species

- alkali sacaton (*Sporobolus airoides*), grass
- big sacaton (*Sporobolus wrightii*), grass
- saltgrass (*Distichlis spicata*), grass

Transition T1A
State 1 to 2

Season-long grazing providing little rest and recovery for preferred grazed plants during critical growing periods, coupled with high utilization.

Restoration pathway R2A
State 2 to 1

Legacy text: "Restoration pathway resulting from the implementation of prescribed grazing." It should be noted that prescribed grazing alone may not effectively diminish

woody plants here. Brush control may also be required. Future work on this ESD should seek to clarify this.

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				516–695	
	alkali sacaton	SPAI	*Sporobolus airoides*	521–695	–
	big sacaton	SPWR2	*Sporobolus wrightii*	521–695	–
2				90–168	
	blue grama	BOGR2	*Bouteloua gracilis*	87–174	–
	James' galleta	PLJA	*Pleuraphis jamesii*	87–174	–
3				168–258	
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	174–261	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	174–261	–
4				90–135	
	squirreltail	ELEL5	*Elymus elymoides*	87–139	–
5				90–135	
	western wheatgrass	PASM	*Pascopyrum smithii*	87–139	–
6				56–90	
	vine mesquite	PAOB	*Panicum obtusum*	53–87	–
7				56–90	
	threeawn	ARIST	*Aristida*	53–87	–
8				56–90	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	53–87	–
Forb					
9				11–56	
	threadleaf ragwort	SEFLF	*Senecio flaccidus var*	9–53	

	threadleaf ragwort	SEFLF	*Senecio flaccidus var. flaccidus*	9–53	–
10				11–56	
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	9–53	–
11				11–56	
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	9–53	–
12				11–56	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	9–53	–
Shrub/Vine					
13				90–168	
	fourwing saltbush	ATCA2	*Atriplex canescens*	87–174	–
	shadscale saltbush	ATCO	*Atriplex confertifolia*	87–174	–
14				56–90	
	winterfat	KRLA2	*Krascheninnikovia lanata*	53–87	–
15				56–90	
	Shrub, deciduous	2SD	*Shrub, deciduous*	53–87	–

Type locality

Location 1: Santa Fe County, NM
Location 2: Torrance County, NM
Location 3: Chaves County, NM
Location 4: De Baca County, NM
Location 5: Guadalupe County, NM
Location 6: Lincoln County, NM
Location 7: San Miguel County, NM

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: Chaves, De Baca, Guadalupe, Lincoln, Sna Miguel, Santa Fe, Torrance.

Characteristic Soils Are:
Manzano

Contributors

Christine Bishop
Don Sylvester
Elizabeth Wright
John Tunberg

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	01/22/2026
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:

---

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:**
