USDA Natural Resources Conservation Service

Ecological site R070AY017NM
Salt Flats

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.

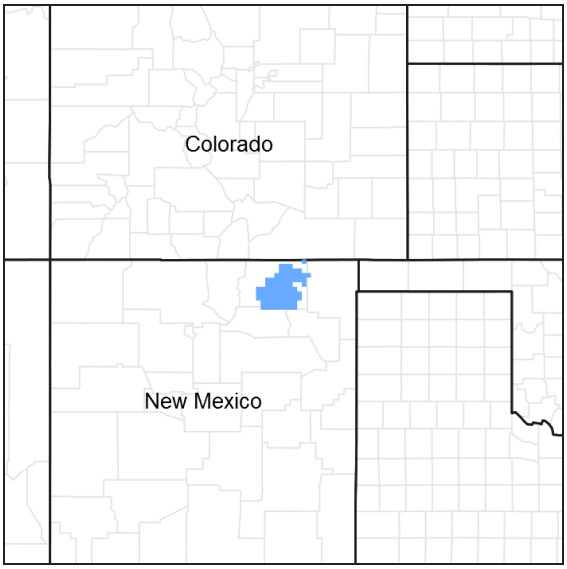

Figure 1. Mapped extent

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

According to the legacy descriptions of soils and physiography, this is an upland site on relatively fine, deep, saline soils. While it's stated that this site does not receive run-on moisture, it stands to reason that this site is sub-irrigated. Evidence for sub-irrigation includes elevated salinity and the presence of fourwing saltbush and alkali sacaton.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on level to moderately sloping uplands in elevations ranging from 5,500 to 6,500 feet. The site may occur in concave depressions but receives little or no additional moisture. The site is differentiated from the other upland sites because of the moderate to strong salinity/alkalinity in the soil profile.

Table 2. Representative physiographic features

Landforms	(1) Alluvial flat
Flooding duration	Extremely brief (0.1 to 4 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	Rare to occasional
Elevation	1,676–1,981 m
Slope	0–3%
Ponding depth	3–8 cm
Water table depth	102 cm
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

Site receives run-on water from associated upland sites.

Soil features

The soils on this site are deep. They are moderately well drained to well drained, and have medium to slow runoff. The surface texture ranges from silty clay loam and saline silty clay loam. The substratum is clay loam and clay. These soils are slow to very slow permeability. The available water holding capacity is high. The hazard of soil erosion is moderate to high and hazard of soil blowing is moderate. These soils are effected by salt. Where adequate soil surface cover is lacking, the soils of this site develop a dispersed surface condition which decreases their infiltration rate.

Characteristic soils are:
La Brier Silty Clay Loam Saline
Swastika Silty Clay Loam Saline
Vermejo Silty Clay Loam Saline

Table 4. Representative soil features

Surface texture	(1) Silty clay (2) Silty clay loam
Family particle size	(1) Clayey
Drainage class	Well drained to poorly drained
Permeability class	Moderate to slow
Soil depth	102 cm
Surface fragment cover <=3"	0–3%
Surface fragment cover >3"	0–1%

Ecological dynamics

This site is a grassland characterized by warm-season mid-grasses with an occasional shrub. Shrubs and half shrubs are sparsely scattered throughout the site. Cool-season species make up a minor component of the community. Vegetation is tolerant of saline or alkaline factors that dominate all processes on the site.

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

Approximately 80 percent of the total annual yield is from species that produce forage for livestock. Continuous grazing in the spring and summer will cause the more desirable forage plants like alkali sacaton, western wheatgrass, blue grama, vine mesquite, and fourwing saltbush to decrease. The species most likely to invade this site are ring muhly, broom snakeweed, Astragalus species, cholla cactus, and plains pricklypear. Species most likely to increase from small amounts are inland salt grass, alkali and mat muhly, and rabbitbrush. As ecological conditions deteriorate it is accompanied by a sharp increase in saltgrass. Inland saltgrass may come to completely dominate the site and there is a reduction in overall ground cover. Spring rest will allow alkali sacaton sufficient time to green up and will benefit the cool season grasses such as western wheatgrass. Occasional summer deferment is needed to maintain the alkali sacaton, especially where cattle are concentrated for periods of time during the growing season.

State and transition model

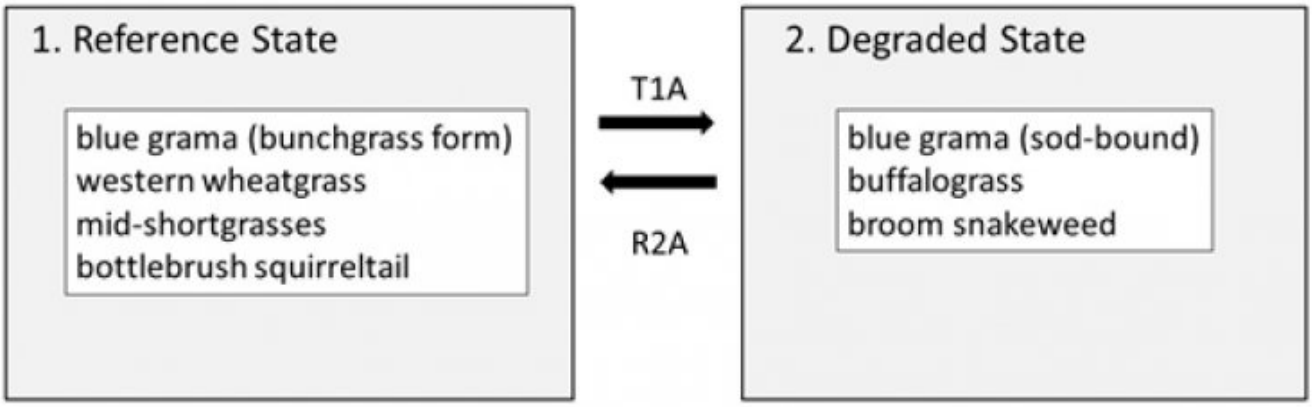

Figure 4. Generalized STM for saline sites in 70A. Not specific to the Salt Flats site, for which a unique STM has not been drafted.

State 1
Reference State

Dominant plant species

- fourwing saltbush (*Atriplex canescens*), shrub
- alkali sacaton (*Sporobolus airoides*), grass

Community 1.1
Reference Plant Community

This site is a grassland characterized by warm-season mid-grasses with an occasional shrub. Shrubs and half shrubs are sparsely scattered throughout the site. Cool-season species make up a minor component of the community. Vegetation is tolerant of saline or alkaline factors that dominate all processes on the site.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	415	785	1177
Shrub/Vine	112	168	314
Forb	22	56	78
Total	**549**	**1009**	**1569**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	3-5%
Grass/grasslike foliar cover	30-35%
Forb foliar cover	1-5%
Non-vascular plants	0%

Biological crusts	0%
Litter	10-15%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	35-40%

Figure 6. Plant community growth curve (percent production by month). NM3717, R070AY017NM Salt Flats HCPC. R070AY017NM Salt Flats HCPC.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	7	10	15	20	25	13	5	0	0

State 2
Degraded

This state is generally dominated by inland saltgrass, alkali and mat muhly, rabbitbrush, ring muhly, broom snakeweed, and plains pricklypear..

Dominant plant species

- fourwing saltbush (*Atriplex canescens*), shrub
- ring muhly (*Muhlenbergia torreyi*), 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

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	**Alkali Sacaton-Tall Warm season**			112–392	
	alkali sacaton	SPAI	*Sporobolus airoides*	112–392	–
2	**Wester wheatgrass-coll season stolons**			56–235	
	western wheatgrass	PASM	*Pascopyrum smithii*	56–235	–
3	**Brue Grama-warm season sod/bunch short**			56–235	
	blue grama	BOGR2	*Bouteloua gracilis*	56–235	–
4	**Inland Saltgrass-salt tolerant stolons**			56–235	
	saltgrass	DISP	*Distichlis spicata*	56–235	–
5	**Vine-mesquite-warm season stolons**			56–235	
	vine mesquite	PAOB	*Panicum obtusum*	56–235	–
6	**Salt Tolerant Muhly**			11–78	
	mat muhly	MURI	*Muhlenbergia richardsonis*	17–78	–
	Texas muhly	MUTE2	*Muhlenbergia texana*	17–78	–
7	**Galleta grass-mat forming stolons**			11–78	
	James' galleta	PLJA	*Pleuraphis jamesii*	17–78	–
8	**Switchgrass-**			11–78	
	switchgrass	PAVIV	*Panicum virgatum var. virgatum*	17–78	–
Shrub/Vine					
9	**Fourwing saltbush**			22–157	
	fourwing saltbush	ATCA2	*Atriplex canescens*	28–157	–
10	**Winterfat**			11–56	
	winterfat	KRLA2	*Krascheninnikovia lanata*	17–56	–
Forb					
11	**Wild Buckwheat**			11–78	
	buckwheat	ERIOG	*Eriogonum*	17–78	–
12	**Globemallow**			11–78	
	globemallow	SPHAE	*Sphaeralcea*	17–78	–

Animal community

This site provides habitat which supports a resident animal community that is characterized by coyote, desert cottontail, meadow mole, sparrow hawk, mourning dove, bull snake and rattlesnake, and Great Plains skunk. There is seasonal use by pronghorn antelope.

Hydrological functions

Soil Series----------Hydrologic Group

La Brier Silty Clay loam Saline-----C
Swastika Silty Clay loam Saline-----C
Vermejo Silty Clay loam Saline-----C

Recreational uses

Hunting for rabbit, antelope, and quail is fair.
Limited aesthetic appeal.

Wood products

No wood products.

Other products

Grazing: This site is suitable for late winter, spring, and early summer grazing. Forage can be best utilized by grazing cattle or horses due to the coarse nature of the forage produced by alkali sacaton. Maximum available forage production can be achieved by mowing in late winter and stocking with cows in the summer, and alternately resting the pasture in the following year. Approximately 80 percent of the total annual yield is from species that produce forage for livestock. Continuous grazing in the spring and summer will cause the more desirable forage plants like alkali sacaton, western wheatgrass, blue grama, vine mesquite, and fourwing saltbush to decrease. The species most likely to invade this site are ring muhly, broom snakeweed, Astragalus species, cholla cactus, and plains pricklypear. Species most likely to increase from small amounts are inland saltgrass, alkali and mat muhly, and rabbitbrush. As ecological conditions deteriorate it is accompanied by a sharp increase in saltgrass. Inland saltgrass may come to completely dominate the site and their is a reduction in overall ground cover. A system of deferred grazing that varies the time of grazing and rest in a pasture during successive years is needed to maintain or improve the plant community. Spring rest will allow alkali sacaton sufficient time to green up and will benefit the cool-season grasses such as western wheatgrass. Occasional summer deferment is needed to maintain the alkali sacaton, especially where cattle are concentrated for periods of time during the growing season.

Other information

Guide to Intitail Stocking Rates expressed as Acres per Animal Unit Month.
Range Similarity index----------Acres/AUM
90+----------2.5 to 3.5
75----------3.3 to 4.4
50----------4.3 to 8
25----------8.1 plus

Type locality

Location 1: Mora County, NM
Location 2: Colfax County, NM
Location 3: Guadalupe County, NM
Location 4: Harding County, NM

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	05/13/2025
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:**
