USDA Natural Resources
Conservation Service

Ecological site R035XB024NM
Saline Bottom 6-10"

Last updated: 5/20/2025
Accessed: 05/20/2025

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.

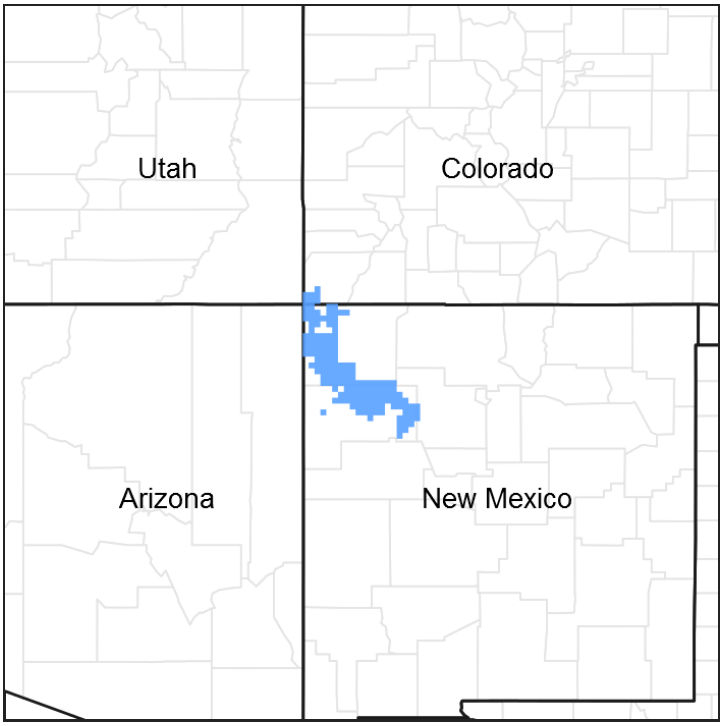


Figure 1. Mapped extent

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 on very deep, well-drained soils on the floodplains of braided streams. Textures are quite variable. EC ranges from 4 to 8 mmhos/cm, and SAR ranges from 13 to 30.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex obovata*
Herbaceous	(1) *Sporobolus airoides* (2) *Pleuraphis jamesii*

Physiographic features

This site occurs on braided floodplains. Therefore, it benefits from run-in water from adjacent areas, especially after high-intensity short-duration summer thunderstorms. Slopes range from 0 to 1 percent. Elevations range from 5,200 to 6,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain
Elevation	1,585–1,829 m
Slope	0–1%
Aspect	Aspect is not a significant factor

Climatic features

Mean annual precipitation varies from 5 to 8 inches with about 60% of it coming as rain from April through October. May and June are the driest months. Most of the precipitation from November through March comes as snow. High-velocity winds are common in late winter and early spring.

Mean temperatures for the hottest month, July, are about 83 degrees F. The coldest month is January, when the mean temperature is about 27 degrees F. Extreme temperatures of 104 and -17 degrees F have been recorded. The frost-free period ranges from 140 to 160 days.

The cool-season plants start growth in March and end with plant maturity and seed dissemination about mid-June. Warm-season plants grow from June through September, taking advantage of the moisture and warmth from tropical air out of the Gulf of Mexico. About 40 percent of the total precipitation is received during these summer months. The other 60 percent, received from fall through spring, influences cool-season plants.

The tabular climate summary for this ESD was generated by the Climate Summarizer (http://www.nm.nrcs.usda.gov/technical/handbooks/nrph/Climate_Summarizer.xls) using data
from the following climate station:
298294 Shiprock, NM (Period of record = 1926 to 2006).

Table 3. Representative climatic features

Frost-free period (average)	167 days
Freeze-free period (average)	190 days
Precipitation total (average)	229 mm

Influencing water features

This site occurs on braided floodplains. Therefore, it benefits from run-in water from adjacent areas, especially after high-intensity short-duration summer thunderstorms.

Soil features

The soils are very deep and well drained. They formed in alluvium derived from sandstone and shale. Surface textures include clay loam. The subsoil has textures of sandy clay loam and silty clay loam. Permeability is moderately slow. Available water holding capacity is low to moderate. Runoff is slow, and the hazard of water erosion is moderate. The hazard of soil blowing is severe. The soils are moderately sodic (SAR 13-30), slightly saline (EC 4-8), and mildly to moderately alkaline (pH 7.4-8.4).

Shiprock SSA:
105 – Hamburn fine sandy loam

Additional information may be found in Section II of the Field Office Technical Guide.

Table 4. Representative soil features

Surface texture	(1) Clay loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow
Soil depth	152 cm
Electrical conductivity (0-101.6cm)	4–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	13–30
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4

Ecological dynamics

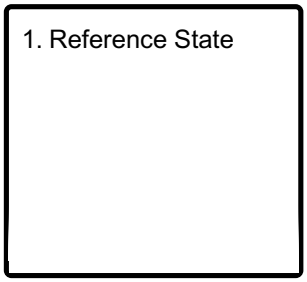
This site has a plant community made up primarily of midgrasses, shortgrasses, some shrubs, and a minor amount of forbs. The reference plant community contains a mixture of cool-season and warm-season grasses.

Plant species most likely to invade or increase on this site when it deteriorates are annual barley, annual wheatgrass, cheatgrass, Russian thistle, and other annual forbs. Continuous livestock grazing during winter and spring decreases the cool-season grasses and increases lower forage value grasses and shrubs.

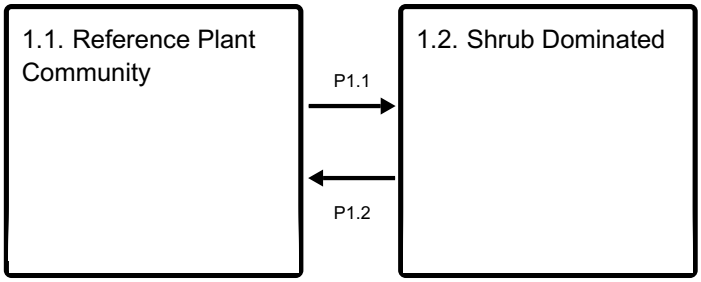
The reference plant community has been determined by study of relict areas or areas protected from excessive grazing. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures, and historical accounts have also been used.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1
Reference State

This state represents the most ecologically stable conditions in terms of resistance to erosion. Moreover, this state has the highest potential for productivity and plant diversity.

Community 1.1
Reference Plant Community

This site has a plant community made up primarily of midgrasses, shortgrasses, some shrubs, and a minor amount of forbs. The reference plant community contains a mixture of cool-season and warm-season grasses. Plant species most likely to invade or increase

on this site when it deteriorates are annual barley, annual wheatgrass, cheatgrass, Russian thistle, and other annual forbs. Continuous livestock grazing during winter and spring decreases the cool-season grasses and increases lower forage value grasses and shrubs. The reference plant community has been determined by study of relict areas or areas protected from excessive grazing. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures, and historical accounts have also been used.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	773	1468	2242
Shrub/Vine	112	258	415
Forb	11	67	135
Total	**896**	**1793**	**2792**

Figure 5. Plant community growth curve (percent production by month). NM0378, R035XB024NM-Saline Bottom 6 to 10 inch-HCPC. R035XB024NM-Saline Bottom 6 to 10 inch-HCPC.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
6	6	7	6	6	5	11	14	12	12	8	7

Community 1.2
Shrub Dominated

This phase is dominated by shrubs.

Pathway P1.1
Community 1.1 to 1.2

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

Pathway P1.2
Community 1.2 to 1.1

Prescribed grazing.

Conservation practices

Prescribed Grazing

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**alkali sacaton**			359–1401	
	alkali sacaton	SPAI	*Sporobolus airoides*	359–1401	–
2	**galleta**			90–415	
	James' galleta	PLJA	*Pleuraphis jamesii*	90–420	–
3	**squirreltail**			45–280	
	squirreltail	ELEL5	*Elymus elymoides*	45–280	–
4	**Indian ricegrass**			0–135	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	0–140	–
5	**western wheatgrass**			0–135	
	western wheatgrass	PASM	*Pascopyrum smithii*	0–140	–
6	**other perennial grasses**			11–135	
Forb					
7	**perennial forbs**			11–78	
8	**annual forbs**			0–56	
Shrub/Vine					
9	**mound saltbush**			45–280	
	mound saltbush	ATOB	*Atriplex obovata*	45–280	–
10	**fourwing saltbush**			0–22	
	fourwing saltbush	ATCA2	*Atriplex canescens*	0–28	–
11	**black greasewood**			0–22	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	0–28	–
12	**other shrubs**			0–78	

Animal community

Livestock -- This site is suitable for yearlong grazing by all classes of livestock, is easily traversed, and is well suited to planned grazing systems. This site may be hazardous to livestock during periods of occasional flooding after high-intensity short-duration summer

thunderstorms.

Wildlife – Extra run-in water benefits riparian plants that may grow near watercourses where soil moisture is adequate. These types of vegetation provide habitat for a large number of wildlife species. Riparian vegetation should be replanted in drainages where the soil is moist. Protection from grazing is essential. Competition between cattle and wildlife is high year-round.

Hydrological functions

Permeability is moderately slow. Available water holding capacity is low to moderate. Runoff is slow, and the hazard of water erosion is moderate.

Recreational uses

This site is well suited to hunting, horseback riding, and wildlife observation. The long, narrow floodplains break the monotony of the surrounding rolling uplands and have a tremendous aesthetic appeal as grasslands.

Type locality

Location 1: San Juan County, NM	
Township/Range/Section	T29N R16W S30
General legal description	Hogback North Quad – 8 miles SE of Shiprock, NM – Navajo Reservation, NM.

Contributors

John Tunberg
Michael Carpinelli
Unknown

Approval

Kendra Moseley, 5/20/2025

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	05/20/2025
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:

---

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:**
