

## Ecological site R035XB022NM Loamy Upland 6-10"p.z. sodic

Accessed: 05/19/2024

### 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.

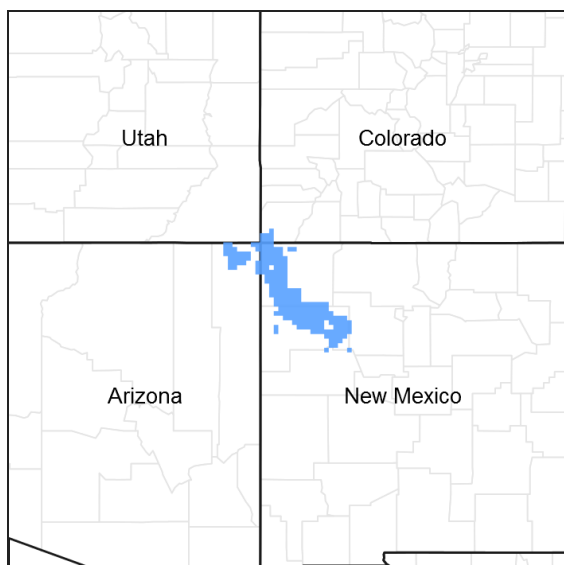


Figure 1. Mapped extent

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.

### MLRA notes

Major Land Resource Area (MLRA): 035X–Colorado Plateau

“ATTENTION: This ecological site meets the requirements for PROVISIONAL (if not more). A provisional ecological site is established after ecological site concepts are developed and an initial state-and-transition model is drafted. A provisional ecological site typically will include literature reviews, land use history information, legacy data (prior approved range site descriptions, forage suitability groups, woodland suitability groups, etc.), and includes some soils data, and estimates for canopy and/or species composition by weight,. A provisional ecological site provides the conceptual framework of soil-site correlation for the development of the ESD. For more information about this ecological site, please contact your local NRCS office.”

### Ecological site concept

This site has a plant community made up primarily of grasses, shrubs, and annual forbs. In the reference plant community, warm-season plants dominate, but there are also some cool-season plants. Alkali sacaton and Mound saltbush are abundant on the site because of the high sodium in the soil.

Plant species most likely to invade or increase on this site when it deteriorates are Russian thistle, Powell's saltweed, mound saltbush, and globemallow. Desirable species decrease if continuously grazed during their growing season, allowing an increase in sodium-tolerant annuals like Powell's saltweed and invasion by Russian thistle.

The soils are shallow to very deep and are well drained. They were formed in alluvium and residuum derived from sandstone and shale. Surface textures include loam, clay loam, sandy clay loam, and fine sandy loam. The subsoil has textures of silty clay, silty clay loam, fine sandy loam, loam, sandy clay loam, clay, channery sandy clay loam, and clay loam. Soft sandstone or shale occurs between 18 and 60 inches. Permeability is very slow to moderately slow. Available water holding capacity is very low to low. Runoff is low to very high, and the hazard of water erosion is slight to severe. The hazard of soil blowing is moderate to severe. The soils are slightly to moderately saline (EC 4-16), moderately to strongly sodic (SAR 13-30+), or neutral to very strongly alkaline (pH 6.6 to 9.4).

Mean annual precipitation varies from 6 to 10 inches. The site does not receive any additional run-in moisture, but may on occasion flood. With the sealing capacity of the soil, flooding events run off rapidly and is not available as extra moisture necessarily to plants.

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Atriplex obovata</i>
Herbaceous	(1) <i>Sporobolus airoides</i>

## Physiographic features

This site occurs on toeslopes and footslopes below mesas, cuestas, knolls, and structural benches of undulating plateaus. This site may receive some additional moisture from adjacent areas, but usually it runs off, giving little benefit. Slopes range from 0 to 5 percent. Elevations range from 4,700 to 6,100 feet.



**Figure 2. Reference Site**

**Table 2. Representative physiographic features**

Landforms	(1) Fan (2) Structural bench (3) Valley floor
Flooding frequency	None
Ponding frequency	None
Elevation	1,433–1,859 m
Slope	0–5%
Water table depth	152 cm
Aspect	Aspect is not a significant factor

## Climatic features

Mean annual precipitation varies from 7 to 10 inches. About 60% of this moisture comes as rain during the months of April through October. May and June are the driest months. Most of the moisture from November through March comes as snow. Winds of high velocity during late winter and early spring are common.

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 degrees F and -17 degrees F have been recorded. 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. During June, July, August, and September, the warm-season plants make optimum growth, taking advantage of the warm temperature and moisture from tropical air out of the Gulf of Mexico. About 40% of the total precipitation is received during these summer months. The other 60% received during the fall, winter, and spring months influences cool-season plants.

**Table 3. Representative climatic features**

Frost-free period (average)	160 days
Freeze-free period (average)	165 days
Precipitation total (average)	254 mm

## Influencing water features

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

## Soil features

The soils are shallow to very deep and are well drained. They were formed in alluvium and residuum derived from sandstone and shale. Surface textures include loam, clay loam, sandy clay loam, and fine sandy loam. The subsoil has textures of silty clay, silty clay loam, fine sandy loam, loam, sandy clay loam, clay, channery sandy clay loam, and clay loam. Soft sandstone or shale occurs between 18 and 60 inches. Permeability is very slow to moderately slow. Available water holding capacity is very low to low. Runoff is low to very high, and the hazard of water erosion is slight to severe. The hazard of soil blowing is moderate to severe. The soils are slightly to moderately saline (EC 4-16), moderately to strongly sodic (SAR 13-30+), or neutral to very strongly alkaline (pH 6.6 to 9.4).

Shiprock SSA NM717:

100-Werito loam

110-Brimhall-Benally-Genats Assoc. (Benally part)

122-Blueflat-Notal Assoc (Blueflat part)

145-Razito-Huerfano Complex (Huerfano part)

180-Kimbeto-Huerfano Complex (Huerfano part)

255-Benally fine sandy loam

Other soils included are:

San Juan County SSA NM618: SC-Fajada-Huerfano-Benally Assoc. (All)

McKinley County SSA NM692: 116-Fajada-Huerfano-Bennally Assoc. (All)

**Table 4. Representative soil features**

Surface texture	(1) Fine sandy loam (2) Loam (3) Sandy clay loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Very slow to moderately slow

Soil depth	51–152 cm
Surface fragment cover <=3"	0–60%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	5.08–12.7 cm
Electrical conductivity (0-101.6cm)	4–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	13–30
Soil reaction (1:1 water) (0-101.6cm)	6.6–9.4
Subsurface fragment volume <=3" (Depth not specified)	0–60%
Subsurface fragment volume >3" (Depth not specified)	0–5%

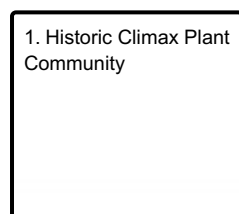
## Ecological dynamics

This site has a plant community made up primarily of grasses, shrubs, and annual forbs. In the historic climax plant community, warm-season plants dominate, but there are also some cool-season plants. Mound saltbush and ribscale are abundant on the site because of the high sodium in the soil.

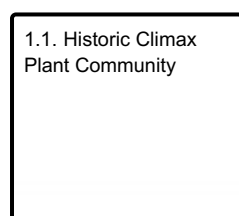
Plant species most likely to invade or increase on this site when it deteriorates are Russian thistle, Powell's saltweed, mound saltbush, and globemallow. Desirable species decrease if continuously grazed during their growing season, allowing an increase in sodium-tolerant annuals like Powell's saltweed and invasion by Russian thistle.

## State and transition model

### Ecosystem states



### State 1 submodel, plant communities



## State 1 Historic Climax Plant Community

### Community 1.1 Historic Climax Plant Community

This site has a plant community made up primarily of grasses, shrubs, and annual forbs. In the historic climax plant community, warm-season plants dominate, but there are also some cool-season plants. Mound saltbush and ribscale are abundant on the site because of the high sodium in the soil. Plant species most likely to invade or increase on this site when it deteriorates are Russian thistle, Powell's saltweed, mound saltbush, and globemallow.

Desirable species decrease if continuously grazed during their growing season, allowing an increase in sodium-tolerant annuals like Powell's saltweed and invasion by Russian thistle.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	112	150	188
Forb	90	128	166
Shrub/Vine	67	96	126
Total	269	374	480

Figure 6. Plant community growth curve (percent production by month).  
NM0377, R035XB022NM-Loamy Upland Sodic-HCPC. R035XB022NM-Loamy Upland Sodic-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

Additional community tables

Animal community

This site provides a high percentage of forbs making this site an ideal feeding area for many species.

Hydrological functions

This site normally receives approximately 7-10 inches of annual precipitation. Most summer rainfall occurs as brief, sometimes heavy, thunderstorms. Slopes range from 0-5%. Runoff is low to very high, and the hazard of water erosion is low on soils with slopes <1%. As the slope increases to 5% the potential for water erosion increases to very high. On sodic soils, erosion potential increases as sodium adsorbed on clay particles disperses and plugs soil pore spaces, thus increasing runoff and decreasing water infiltration, percolation, and drainage.

Recreational uses

Wildlife observation, rock hounding, horseback riding, photography, and hiking are all recreationl activities that can be enjoyed on this site. Care must be taken to prepare for hot, dry summers and cold winters.

Wood products

This site has no significant value for wood products.

Other products

Grazing: This site is suitable for grazing by all classes of livestock during most seasons of the year. Planned grazing systems can be readily adapted to this site. This site will seldom be used as a key management area for livestock.

Inventory data references

The potential historic climax plant community has been determined by study of range 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.

Type locality

Location 1: San Juan County, NM
---------------------------------

Township/Range/Section	T27N R19W S20
General legal description	Mitten Rock topographic quadrangle. 1 mile west of Big Gap Reservoir, Navajo Indian Reservation, NM

## Contributors

David Trujillo  
 Jerry Rioux  
 John Tunberg  
 Michael Carpinelli  
 Peter Lefebvre

## 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:**

---