Ecological site R070BY066NM
Gyp Uplands

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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.

Ecological site concept

This site occurs on gypsum-derived soils on upland landforms. Soils are gypsiferous in subsurface horizons, and are usually less than 20 inches to gypsum bedrock. Slopes range from 0 to 50 percent.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex canescens* (2) *Ephedra*
Herbaceous	(1) *Bouteloua breviseta* (2) *Bouteloua eriopoda*

Physiographic features

This site occurs shallow and very shallow, well-drained, moderately permeable soils that formed in loamy, calcareous, and gypsiferous sediments. Soils are on basins, valley floors or adjacent terraces and have slopes of 0 to 15 percent. Drainage channels may dissect the site. Mean annual precipitation is about 11 inches and the mean annual temperature is about 62 degrees F. Aspect varies, but is not ecologically significant.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Basin floor (3) Valley floor
Elevation	1,280 – 1,460 m
Slope	0 – 20 %
Aspect	Aspect is not a significant factor

Climatic features

The climate of this area can be classified as “semi-arid continental”.

Annual average precipitation ranges from 11 to 16 inches. Roughly 78 percent of the moisture falls during the 6-month period of May through October. Most of this summer precipitation falls in the form of brief and heavy afternoon and evening thunderstorms. Hail may accompany the more severe summer storms. In the winter, there is normally only one day a month when as much as one-tenth inch of moisture falls, usually in the form of snow. Snow seldom lies on the ground for more than a few days.

Temperatures are characterized by a distinct seasonal change and large annual and diurnal temperature ranges. Summers are moderately warm. Maximum temperature average above 90 degrees F from July to August, and an average summer includes about 80 days with high readings exceeding 90 degrees F and 10 days with readings above 100 degrees F. Temperatures usually fall rapidly after sundown and lows average 60 degrees F on most summer nights. Winters are mild, sunny, and dry. Daytime shade temperatures in midwinter usually rise to the 50’s. However, freezing temperatures normally occur at night from mid-November to mid-March.

The freeze-free season ranges from 196 to 218 days. Dates of the last freeze range from April 11th to April 17th and the first freeze ranges from October 20th to October 25th.

Both temperature and rainfall distribution favor warm-season, perennial plant communities in the area. However, sufficient late winter and early spring moisture allows cool-season species to occupy a minor component within the plant community.

Climate data was obtained from http://www.wrcc.dri.edu/summary/climsmnm.html web site. Data were interpreted utilizing NM Climate Summarizer spreadsheet.

Table 3 Representative climatic features

Frost-free period (average)	190 days
Freeze-free period (average)	220 days
Precipitation total (average)	410 mm

Influencing water features

This site is not influenced by water from wetlands or streams.

Soil features

Soils are shallow and very shallow over gypsum. Surface layers are about 4 to 8 inches thick and have textures of sandy loam, loam, or silt loam. The subsurface is a gypsiferous loam about 8 to 15 inches thick. Underlying material is white or yellowish gypsum to a depth greater than 60 inches. The available water-holding capacity is low. Permeability is moderate. Gypsum outcrop is common. There are a few areas of deeper soils.

Minimum and maximum values listed below represent the characteristic soils for this site.

Characteristic soils:
Holloman
Hollomex

Table 4. Representative soil features

Surface texture	(1) Gypsiferous sandy loam (2) Gypsiferous loam (3) Gypsiferous silt loam
Family particle size	(1) Loamy

Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to moderate
Soil depth	50 – 180 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	5.08 – 15.24 cm
Calcium carbonate equivalent (0-101.6cm)	10 – 20 %
Electrical conductivity (0-101.6cm)	0 – 20 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 8.5
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

The vegetation of this site often intergrades with that of Loamy ecological sites, depending on the amounts of gypsum, soil texture, and depths of gypsic horizons. Low-lying areas where run-on water occurs behave like draws. Areas where gypsum outcrops are exposed harbor little vegetation. Gyp Uplands may intergrade with the Salt Flats ecological site depending on salinity levels. Thus, the vegetation of this site is very patchy, variable, and difficult to characterize.

Because of the complexity described above, the reference plant community can be subdivided into three components: 1) A blue grama, black grama, tobosa-dominated community associated with soils having relatively deep (greater than 10 inches) gypsic horizons. 2) An alkali sacaton, blue grama, black grama community associated with deep (greater than 10 inches) gypsic horizons and occupying areas

that receive extra run-on water, and 3) a gyp grama and gyp dropseed-dominated community on soils with shallow (less than 10 inches) gypsic horizons.
Tobosa and burrograss may also dominate depending on texture, land-use history, or other features. The subshrub Coldenia* increasingly dominates sites with very shallow gypsic horizons as grasses decline. Gyp Uplands soils are susceptible to erosion when vegetative cover is reduced due to drought and overgrazing. Mesquite may invade soils with deeper gypsic horizons that are dominated by tobosa or burrograss. Erosion of A horizons brings gypsic horizons closer to the surface and can shift community composition to dominance by gyp dropseed, Coldenia*, and bare soil.
*Coldenia refers to a genus rather than a common name. As of now, EDIT does not support italics in narratives.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**gyp grama black grama**			90-101	
	gypsum grama	BOBR	*Bouteloua breviseta*	91-105	–
	black grama	BOER4	*Bouteloua eriopoda*	91-105	–
2	**blue grama gyp dropseed**			67-101	
	blue grama	BOGR2	*Bouteloua gracilis*	71-99	–
	gyp dropseed	SPNE	*Sporobolus nealleyi*	71-99	–
3	**tobosa grass**			56-67	
	tobosagrass	PLMU3	*Pleuraphis mutica*	56-71	–
4	**alkali sacaton**			34-45	
	alkali sacaton	SPAI	*Sporobolus airoides*	35-49	–
5				22-34	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	21-35	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	21-35	–
6				22-34	
	threeawn	ARIST	*Aristida*	21-35	–
7				11	
	low woollygrass	DAPU7	*Dasyochloa pulchella*	7-15	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	7-15	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	7-15	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	7-15	–
Forb					
8				22-45	
	crinklemat	TIQUI	*Tiquilia*	28-43	–
9				0-22	
	buckwheat	ERIOG	*Eriogonum*	0-21	–
	southern goldenbush	ISPL	*Isocoma pluriflora*	0-21	–
10				0-11	
	locoweed	OXYTR	*Oxytropis*	0-7	–
11				11-22	
	Forb, perennial	2FP	*Forb, perennial*	7-21	–
12				11-22	
	Forb, annual	2FA	*Forb, annual*	15-28	–

Shrub/Vine					
13				11-22	
	fourwing saltbush	ATCA2	*Atriplex canescens*	7-21	–
	jointfir	EPHED	*Ephedra*	7-21	–
14				11-22	
	javelina bush	COER5	*Condalia ericoides*	7-21	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	7-21	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	7-21	–
	pricklypear	OPUNT	*Opuntia*	7-21	–
	yucca	YUCCA	*Yucca*	7-21	–

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 7. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Animal community

This site provides habitat which supports a resident animal community characterized by spotted skunk, black-tailed jackrabbit, desert cottontail, white-throated woodrat, common raven, roadrunner, loggerhead shrike, collard lizard, checkered whiptail, and western diamondback rattlesnake. There is seasonal use by mule deer and pronghorn antelope.

Hydrological functions

The runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups. Hydrologic Interpretations Soil Series Hydrologic Group Hollomex ----------B or D Holloman ----------B

Wood products

This site produces no wood products.

Other products

Grazing: This site can be grazed at any season of the year by all classes of livestock, generally without regard to age. However, it has limited potential as a grazing resource. This site can be easily damaged by heavy grazing pressure causing a loss in cover and deterioration of the plant community to gyp grama, gyp dropseed and Coldenia to become completely dominant. Further deterioration results in soil loss, eventually leading to a bare gypsum surface. Grazing management should be designed to maintain adequate plant cover to prevent soil erosion. Due to the sites low potential to produce forage, this site should not be exposed to heavy grazing pressure. A system of deferred grazing by domestic livestock, which varies the season of grazing and rest during successive years is needed to maintain the plant community. Approximately 70 percent of the annual yield is from species that furnish forage for livestock. This site provides good nutrition to livestock during the winter, but care must be taken not to overgraze during this period.

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	09/17/2026
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):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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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:**
