Ecological site R035XA130NM
Shale Hills
10-14"p.z.

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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.

MLRA notes

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

“PROVISIONAL ecological site concepts developed and described. See Project Plan [insert Project Plan Name] for more details and related milestones.”

Ecological site concept

“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.”

Table 1. Dominant plant species

Tree	(1) *Juniperus monosperma* (2) *Pinus edulis*
Shrub	(1) *Atriplex canescens*
Herbaceous	(1) *Sporobolus airoides* (2) *Pleuraphis jamesii*

Physiographic features

This site occurs on mesa side slopes as rolling hills dissected by small arroyos. Slopes range from 3 to 35 percent. Elevations range from 5,800 feet to 6,900 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Scarp slope
Flooding frequency	None

Ponding frequency	None
Elevation	1,770 – 2,100 m
Slope	0 – 40 %
Aspect	Aspect is not a significant factor

Climatic features

Average annual precipitation varies from about 10 inches to just over 16 inches. Fluctuations ranging from about 5 inches to 25 inches are not uncommon. The overall climate is characterized by cold dry winters in which winter moisture is less than summer. As much as half or more of the annual precipitation can be expected to come during the period of July through September. Thus, fall conditions are often more favorable for good growth of cool-season perennial grasses, shrubs, and forbs than are those of spring.

The average frost-free season is about 120 days and extends from approximately mid May to early or mid September. Average annual air temperatures are 50 degrees F or lower and summer maximums rarely exceed 100 degrees F. Winter minimums typically approach or go below zero. Monthly mean temperatures exceed 70 degrees F for the period of July and August.

Rainfall patterns generally favor warm-season perennial vegetation, while the temperature regime tends to favor cool-season vegetation. This creates a somewhat complex community of plants on any given ecological site, which is quite susceptible to disturbance and is at or near its productive potential only when both the natural warm and cool-season dominants are present.

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)	150 days
Freeze-free period (average)	170 days
Precipitation total (average)	410 mm

Influencing water features

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

Soil features

These soils have formed in place from shale. The soils are deep with very stony loam or clay loam surface textures. Subsoils are clay loams and clays. Also, the underlying materials are clays and clay loams. The soils are calcareous from 14 to 20 inches below the surface to 60 inches. Permeability is slow (0.06 to 0.2 inches per hour) to very slow (less than 0.06 inches per hour). Water-holding capacity is high (7.5 to 10 inches). Reaction is neutral to strongly alkaline.

Typical Soil Components and MUs that may be seen:
SSA 692 McKinley County Area NM - MUs 210, 250, and 290 Hospah; 361 and 561 Tekapo

Table 4. Representative soil features

Surface texture	(1) Cobbly clay loam (2) Very stony silty clay loam (3) Channery
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Very slow to slow
Soil depth	100 – 180 cm
Surface fragment cover <=3"	20 – 30 %
Surface fragment cover >3"	10 – 20 %
Available water capacity (0-101.6cm)	5.08 – 10.16 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 10
Subsurface fragment volume <=3" (Depth not specified)	10 – 20 %

Subsurface fragment volume >3" (Depth not specified)	10 %

Ecological dynamics

Overview
This is a moderately productive site that occurs on sideslopes of hills, ridges, and breaks, and on escarpments of mesas and cuestas. Grasses are the dominant component of the reference plant community; however, areas of surface rock and gravel and intermittent bare patches fragment the grass cover. Alkali sacaton is the dominant grass. Woody species such as fourwing saltbush, broom snakeweed, and a few juniper and pinyon are scattered across the site. Forbs are typically a minor component.

Catalog of states and community pathways

Reference State
Reference Plant Community. Alkali sacaton is the dominant grass with galleta occurring as the subdominant. Other grasses common to the site include blue grama, black grama, and sideoats grama. At higher elevations (above 6500 feet) and on north facing slopes, black grama begins to drop out and alkali sacaton, galleta, and blue grama typically increase in percent composition. Fourwing saltbush, broom snakeweed, and sacahuista are common shrubs. Oneseed juniper and pinyon appear widely scattered across the site. If this site is subjected to continuous heavy grazing, plants such as alkali sacaton, sideoats grama, black grama, and fourwing saltbush typically decrease. Galleta and blue grama increase in response and may become dominant. Variation in plant community composition occurs due to differences in geology and soil chemistry. Those sites correlated to Shale Hills located northwest of Grants, New Mexico, in the Hospah, Pueblo Pintado, and Rincon Marquez areas are composed of sodium-affected, olive colored soils, derived from shale parent material that developed during the Cretaceous period. These sites have a greater proportion of shadscale, mound saltbush, and Bigelow sagebrush, typically with higher total annual production.

Diagnosis: Grasses are dominant accounting for approximately 80-90 percent or the total annual production. Grass cover is somewhat patchy. Rock fragments account for a large proportion of ground cover. Shrubs and a few juniper and pinyon are scattered across the site. Evidence of erosion such as pedestalling of grasses, rills, and gullies is infrequent.

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				154-256	
	alkali sacaton	SPAI	*Sporobolus airoides*	154-256	–
2				102-154	
	James' galleta	PLJA	*Pleuraphis jamesii*	102-154	–
3				6-26	
	blue grama	BOGR2	*Bouteloua gracilis*	6-26	–
4				0-52	
	black grama	BOER4	*Bouteloua eriopoda*	0-52	–
5				6-26	
	sideoats grama	BOCU	*Bouteloua curtipendula*	6-26	–
6				6-26	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	6-26	–
	silver bluestem	BOSA	*Bothriochloa saccharoides*	6-26	–
7				0-26	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	0-26	–
Forb					

8				6-16	
	Forb, annual	2FA	*Forb, annual*	6-16	–
9				6-16	
	Forb, perennial	2FP	*Forb, perennial*	6-16	–
Tree					
10				0-26	
	oneseed juniper	JUMO	*Juniperus monosperma*	0-26	–
	twoneedle pinyon	PIED	*Pinus edulis*	0-26	–
Shrub/Vine					
11				0-16	
	sacahuista	NOMI	*Nolina microcarpa*	0-16	–
12				0-20	
	fourwing saltbush	ATCA2	*Atriplex canescens*	0-20	–
13				6-16	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	6-16	–
14				6-16	
	Shrub, deciduous	2SD	*Shrub, deciduous*	6-16	–

Animal community

No Data

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 Hospah----------D Rana----------D Rojo----------? Sandoval----------D Shingle----------D Tekapo----------D

Recreational uses

No Data

Wood products

This site produces no significant wood products in its potential plant community.

Other products

Grazing: This site is suitable for grazing by all classes of livestock in all seasons. However, it is poorly suited to continuous year-long use if potential natural vegetation is to be maintained. Inadequate management of the site results in the deterioration of the potential plant community. Alkali sacaton, sideoats grama, black grama, and fourwing saltbush decrease. Plants that increase includes galleta, blue grama, cane and silver bluestem, broom snakeweed, and annuals. Very little perennial ground cover and large areas of bare, exposed soil indicate severe deterioration. A planned grazing system with periodic deferment is best to maintain the desirable balance between plant species and to maintain the natural productivity and plant vigor. During periods of high precipitation the soil can become saturated. Grazing should be delayed until the soil is firm. The high percentage of stones on the surface limits the use of most equipment.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month Similarity Index----------Ac/AUM 100 - 76----------4.0 – 5.2 75 – 51----------5.0 – 7.5 50 – 26----------7.0 – 13.5 25 – 0----------13.5+

Type locality

Location 1: Catron County, NM

Location 2: Socorro County, NM

Other references

Data collection for this site was done in conjunction with the progressive soil surveys within the New Mexico and Arizona Plateaus and Mesas 36 Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: McKinley, Sandoval, Cibola, Socorro, Catron, Rio Arriba.
Characteristic Soils Are:
Hospah, Rana, Rojo, Shingle, Tekapo

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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:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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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):**

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:**