USDA Natural Resources
Conservation Service

Ecological site R070AY004NM
Bottomland

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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.

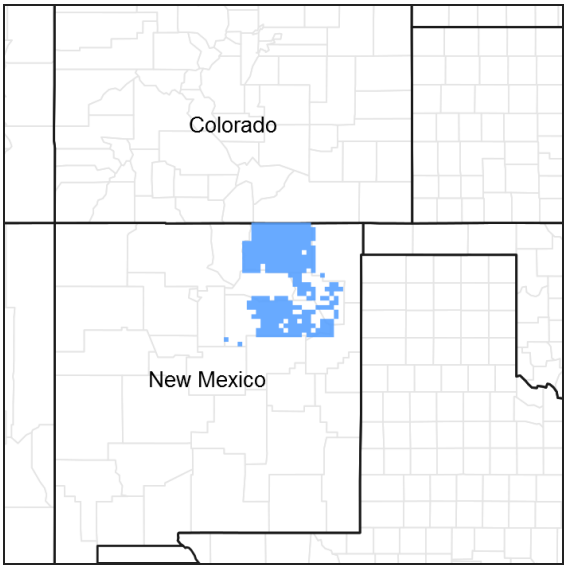

Figure 1. Mapped extent

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

This site occurs on alluvial landforms that receive run-on moisture. Soils are deep to very deep; are derived from shale alluvium; and are fine-loamy, fine-silty, or fine.
This site correlates to the Run-on ecological site group.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Sporobolus airoides* (2) *Pascopyrum smithii*

Physiographic features

This site occurs on nearly level to gently sloping soils that formed in alluvium from shale on broad drainageways, floodplains and alluvial fans. Slopes are 0 to 3 percent. The mean annual precipitation is about 16 inches. Elevation ranges from of 5,000 to 7,500 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Drainageway (3) Alluvial fan
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Rare to occasional
Ponding frequency	None
Elevation	1,524–2,286 m
Slope	0–5%
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

This site is influenced by run-on water, but nor by water from a wetland or stream.

Soil features

Soils are deep to very deep. Surface texture are silty clay loam, loam, clay loam or silty clay or silt loam. The

underlying material textures are silty clay loam, silty clay, loam, clay loam, sandy clay loam, or silt loam. It may have strata of loamy sand, sandy loam, loam, silt loam, silty clay loam or clay loam. It may also have thin strata of sand, sandy loam, or silt. Permeability is rapid to slow. Available water-holding capacity is moderate to high. Effective rooting depth is generally more than 60 inches. Air-water relationship is favorable for plant growth.

Table 4. Representative soil features

Surface texture	(1) Clay loam (2) Sandy loam (3) Loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Slow to rapid
Soil depth	152–183 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	15.24–30.48 cm
Calcium carbonate equivalent (0-101.6cm)	5–15%
Electrical conductivity (0-101.6cm)	0–6 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–2
Soil reaction (1:1 water) (0-101.6cm)	7.5–8.6
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

An ecological dynamics narrative was not included in the original legacy ESD. However, it stands to reason that major ecological drivers would be grazing and hydrology. Continuous grazing will reduce palatable grasses such as western wheatgrass and vine mesquite. Channel incision and upstream water diversion will translate to reduced soil moisture status and an attendant reduction in plant production.

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

Continuous grazing during the growing season will cause the more desirable forage plants such as western wheatgrass, vine mesquite, sideoats grama, Canadian wildrye and fourwing saltbush to decrease. Species most likely to invade this site are buffalograss, ring muhly, cholla cactus, plains pricklypear cactus and rubber rabbitbrush. Species most likely to increase are blue grama, galleta, alkali sacaton and desert saltgrass. As the ecological condition deteriorates, it is accompanied by a loss of vegetative cover causing channeling of the water, and the productivity is greatly reduced. The plant community may be dominated either by blue grama/galleta or alkali sacaton/galleta as deterioration advances. Spring deferment is beneficial to western wheatgrass and allows alkali sacaton sufficient time to green up.

State and transition model

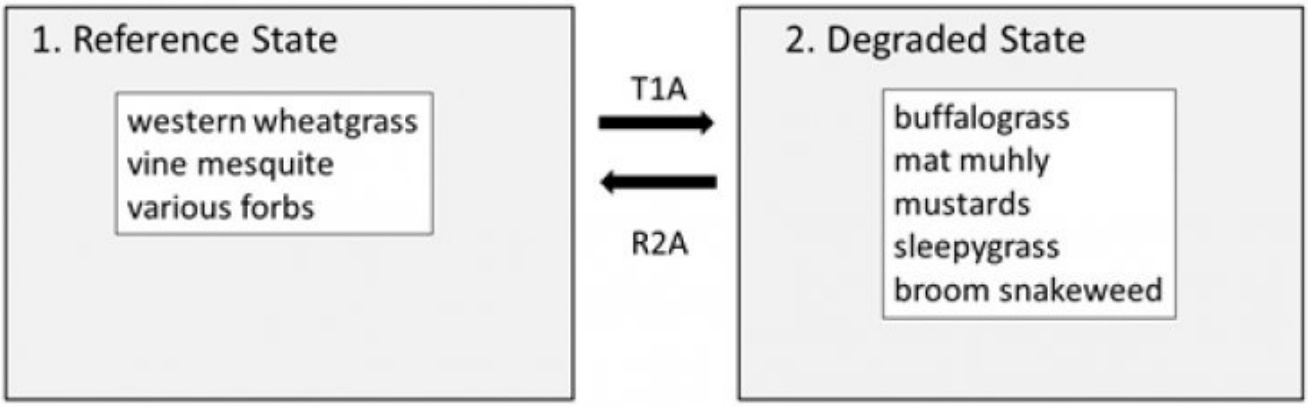

Figure 4. Generalized STM for run-on sites in 70A

State 1
Reference State

Community 1.1
Reference Plant Community

Grasses dominate this site. Mid-grasses such as western wheatgrass, alkali sacaton and sideoats grama are dominant with a variety of short grasses. Forbs and shrubs are only a minor portion of the plant community. This site occurs in elongated drainages that transport surface runoff from adjoining upland sites and swales. Because of the extra water received by this site, the grass is denser and stands higher. This is one of the most productive sites in the resource area.

Forest understory. Other grasses that could appear include: mat muhly, sand muhly, Hall's panicum, and three-awn species.

Other shrubs that could appear include: plains prickly pear cactus.

Other forbs that could appear include: verbena, thistle spp., silverleaf nightshade, and prairie clover.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	986	2466	3945
Forb	90	224	359
Shrub/Vine	34	84	135
Total	**1110**	**2774**	**4439**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	1-5%

Grass/grasslike foliar cover	40-45%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	15-20%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	35-40%

Table 7. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0%
Grass/grasslike basal cover	30-35%
Forb basal cover	5-8%
Non-vascular plants	0%
Biological crusts	0%
Litter	15-20%
Surface fragments >0.25" and <=3"	0-3%
Surface fragments >3"	0-3%
Bedrock	0%
Water	0%
Bare ground	35-40%

Figure 6. Plant community growth curve (percent production by month). NM3704, R070AY004NM Bottomland HCPC. R070AY004NM Bottomland HCPC Grassland with minor components of forbs and shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	5	10	10	25	30	12	5	0	0

State 2
Degraded

This state is dominated by species such as blue grama, galleta, alkali sacaton and desert saltgrass.

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 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				695–841	
	alkali sacaton	SPAI	*Sporobolus airoides*	701–841	–
2				560–695	
	western wheatgrass	PASM	*Pascopyrum smithii*	560–701	–
3				560–695	
	vine mesquite	PAOB	*Panicum obtusum*	560–701	–
4				415–560	
	blue grama	BOGR2	*Bouteloua gracilis*	420–560	–
5				280–415	
	James' galleta	PLJA	*Pleuraphis jamesii*	280–420	–
6				280–415	
	sideoats grama	BOCU	*Bouteloua curtipendula*	280–420	–
7				22–135	
	silver bluestem	BOSA	*Bothriochloa saccharoides*	28–140	–
8				22–135	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	28–140	–
9				22–135	
	saltgrass	DISP	*Distichlis spicata*	28–140	–
10				22–135	
	Canada wildrye	ELCA4	*Elymus canadensis*	28–140	–
11				22–135	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	28–140	–
Forb					
12				22–135	
	globemallow	SPHAE	*Sphaeralcea*	28–140	–
13				22–135	
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	28–140	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	28–140	–
14				22–135	
	Forb, perennial	2FP	*Forb, perennial*	28–140	–
15				22–135	
	Forb, annual	2FA	*Forb, annual*	28–140	–
Shrub/Vine					
16				0–135	
	fourwing saltbush	ATCA2	*Atriplex canescens*	0–140	–
	Apache plume	FAPA	*Fallugia paradoxa*	0–140	–
17				22–135	
	Shrub, deciduous	2SD	*Shrub, deciduous*	28–140	–

Animal community

Habitat for Wildlife:

This site provides habitats which support a resident animal community that is characterized by coyote, badger, black-tailed jackrabbit, plains pocket gopher, marsh hawk, horned lark, magpie, western racer, and Great Plains skunk.

Pronghorn antelope and mule deer will make seasonal use of these habitats. Red-wing blackbirds breed in these habitats.

Hydrological functions

The runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups. It is subject to flooding one or more times in most years.

Hydrologic Interpretations

Soil Series----- Hydrologic Group
La Brier-------- C
Manzano--------- C
Vermejo--------- D

Recreational uses

This site provides poor camping, hiking and picnicking. Hunting is fair for rabbits. It provides limited use as big game winter range. The site is closely associated with breaks in the physiographic features of the landscape. It provides some use by antelope if the site is associated with open grassland.

Wood products

This site has no significant value for wood products.

Other products

Grazing:

This site can be grazed any season of the year by all classes and kinds of livestock. Because of the forage produced by alkali sacaton, cattle and horses may best be suited. Continuous grazing during the growing season will cause the more desirable forage plants such as western wheatgrass, vine mesquite, sideoats grama, Canadian wildrye, and fourwing saltbush to decrease. Species most likely to invade this site are buffalograss, ring muhly, cholla cactus, plains pricklypear cactus, and rubber rabbitbrush. Species most likely to increase are blue grama, galleta, alkali sacaton, and desert saltgrass. As the ecological condition deteriorates, it is accompanied by a loss of vegetative cover causing channeling of the water, and the productivity is greatly reduced. The plant community may be dominated either by blue grama/galleta or alkali sacaton/galleta as deterioration advances. Where alkali sacaton dominates the site, livestock should be concentrated into small pastures to fully utilize the forage. Livestock should be rotated in the summer or pasture should be rested in alternate years. A system of deferred grazing, which varies the time of grazing and rest in a pasture during successive years, is needed to maintain or improve the plant community. Spring deferment is beneficial to western wheatgrass and allows alkali sacaton sufficient time to green up.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index----- Ac/AUM
100 - 76---------- 0.8 – 1.0
75 – 51---------- 0.9 – 1.4
50 – 26---------- 1.3 – 4.6

25 – 0---------- 4.6+

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.

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Date	04/26/2005
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None

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2. **Presence of water flow patterns:** Water flow patterns can exist down towards main channel from side slopes, especially on steeper slopes.

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3. **Number and height of erosional pedestals or terracettes:** Some minor amounts (less than 1/2 inch in height) due to water flow patterns.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 15-25 percent or less bare ground with bare patches ranging from 5-10 inches in diameter. Bare ground can increase following prolonged drought. Wildfire will cause bare ground to increase.

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5. **Number of gullies and erosion associated with gullies:** Occasional due to water flow patterns from upland areas

(down towards main channel).

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Deposition can occur in some areas where water flow paths deposit sediment.

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7. **Amount of litter movement (describe size and distance expected to travel):** Litter movement during storm events i.e. floods will cause movement of all sizes of litter (movement 1 to 3 yards). Some litter may create small dams.

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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):** Stability class rating anticipated to be 3-4 in interspaces at soil surface. These values will need verification at reference site.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Average SOM ranges from 1-5 percent. (Manzano) A1-0 to 9 inches; dark brown (7.5 YR 4/2) loam, very dark brown (7.5 YR 2/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Diverse grass, forbs, shrub functional/structural groups and diverse root structure/patterns reduce raindrop impact and slows overland flow, providing increased time for infiltration to occur. Extended drought reduces short, mid and tall warm bunchgrasses, causing decreased infiltration and increased runoff following intense storm events, especially in bare patch areas if present.

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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):** None

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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: Warm-Season Bunchgrass>Cool-Season Mid Rhizomatous=Warm-Season Stoloniferious

    Sub-dominant: Warm-Season Short Bunchgrass/Rhizomatous>

    Other: Warm-Season Tall Bunchgrass>Shrubs>Warm Season Sod>Forbs>Trees/Willows

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Minimal

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14. **Average percent litter cover (%) and depth (in):** Litter amounts can be reduced following extended drought or wildfire

events.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** (Low Production 1,000 pounds per acre) (Average RV Production pounds per acre) (High Production 4,000 pounds per acre) Production can be reduced following extended drought or the first growing season following wildfire.

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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:** Invasive plants should not occur in reference plant community. Salt cedar, a non-native species, can overtake natural vegetation and Russian olive can also invade into this site. Blue grama is a native (non-invasive) increaser on this site. Available surface or subsurface water can also be greatly affected on this site.

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17. **Perennial plant reproductive capability:** All plants should be vigorous, healthy and reproductive depending on disturbances i.e. drought. Plants should have numerous seed heads, vegetative tillers, etc. The only limitations are weather, wildfire, and natural disease that may temporarily reduce reproductive capability. Surface and subsurface water greatly influences plants reproductive capability.
