USDA Natural Resources
Conservation Service

Ecological site R042CY155NM
Draw

Last updated: 10/21/2024
Accessed: 05/12/2025

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 in a thin line bordering the large drainageways that dissect limestone hills. This site receives and transports water from both remote higher elevations and adjacent sites. Slopes range from 1 to 4 percent.
The soils on this site are deep and well drained. Surface textures are loams, silty clay loams, and clay loams. The soil profile is often interrupted with cobble or stones.

Table 1. Dominant plant species

Tree	(1) *Chilopsis*
Shrub	(1) *Fallugia paradoxa*
Herbaceous	(1) *Sporobolus wrightii*

Physiographic features

This site occurs in a thin line bordering the large drainageways that dissect limestone hills. This site receives and transports water from both remote higher elevations and adjacent sites. Slopes range from 1 to 4 percent. Direction of slope is generally east to southeast, but is not significant. Elevations range from 4,000 to 7,000 feet.

Table 2. Representative physiographic features

Landforms	(1) V-shaped valley (2) Flood plain
Flooding duration	Extremely brief (0.1 to 4 hours) to brief (2 to 7 days)
Flooding frequency	None to occasional
Elevation	1,219–2,134 m
Slope	1–4%

Climatic features

The climate of this area is “semi-arid continental.”

Annual average precipitation ranges from 11 to 19 inches. Variations of 5 inches, more or less, are not uncommon. Approximately 70 percent of the precipitation occurs from May through October. Most of the summer rain comes in the form of high-intensity, short- uration thunderstorms. Winter moisture is usually negligible.

Temperatures are characterized by distinct seasonal changes and large annual diurnal temperature changes. The average annual temperature ranges from 55 degrees F to 60 degrees F, with extremes of 20 degrees F below zero in the winter to 110 degrees F in the summer not uncommon.

The average frost-free season is 170 to 189 days. The last killing frost is in early April and the first killing frost is in mid October.

Both temperature and precipitation favor a warm-season perennial plant community. However, because of the position of this site, there is enough moisture in the late winter and early spring to allow for cool season species to make up an important component of this site. Runoff plus cold air drainage from higher elevations make this site favorable for cool season plant growth.

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

Table 3. Representative climatic features

Frost-free period (average)	189 days
Freeze-free period (average)	211 days
Precipitation total (average)	483 mm

Influencing water features

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

*The legacy statement above could use some clarification. This site is associated with ephemeral streams, but not with perennial streams or wetlands.

Soil features

The soils on this site are deep and well drained. Surface textures are loams, silty clay loams, and clay loams. Permeability is moderate and water holding capacity is high. The soil profile is often interrupted with cobble or stones.

Characteristic soils are:
Pecos silty clay loam

Table 4. Representative soil features

Surface texture	(1) Loam (2) Silty clay loam (3) Clay loam
Family particle size	(1) Clayey
Drainage class	Somewhat poorly drained to well drained

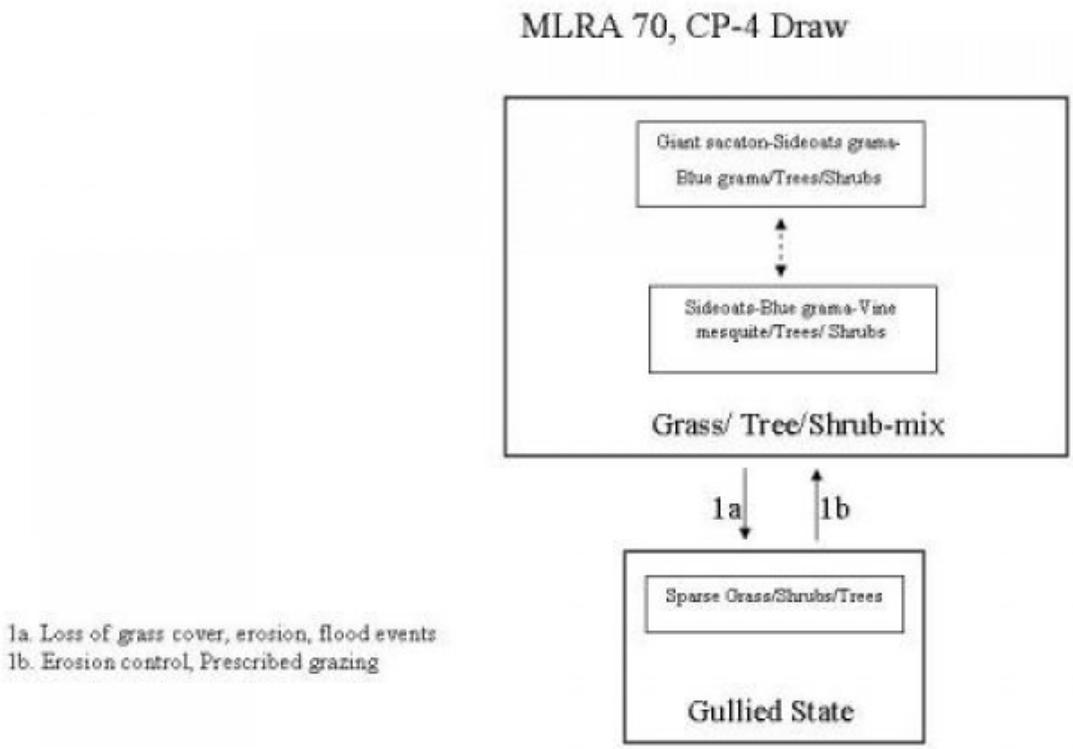
Ecological dynamics

MLRA-70, CP-4: Draw

Overview
The Draw site is associated with Limestone Hills. Draw sites typically occur as elongated narrow areas along valley drainages dissecting Limestone Hills. The aspect of this site is dominated by riparian type vegetation, with an understory of mid and tall perennial grasses. Because of the constant flooding of this site, there is a potential for many annual species to occur. The cold air drainage this site receives helps to maintain a cool season grass component. Pinyon, juniper and ponderosa pine can also occur at higher elevations. The production and

composition may vary greatly with elevation. Loss of grass cover makes this site susceptible to erosion, and may facilitate the transition to the Gullied State.

State and transition model



State 1
Grass/Tree/Shrub-Mix

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
Grass/Tree/Shrub-Mix

Grass/Tree/Shrub-Mix: The reference plant community of the Draw site is a mix of grasses, trees, and shrubs with forbs as the minor component. Giant sacaton is the dominant grass species in the historic plant community, with blue grama, and sideoats grama occurring as sub-dominants. Other grasses that occur in significant numbers include western wheatgrass, vine mesquite, Indiangrass, bluestem species, plains bristlegrass and bottlebrush squirreltail. Giant sacaton has the capability to produce large amounts of aboveground biomass, which provides important forage for livestock and helps to slow runoff, increase infiltration, and protect the site from erosion. Grazing in the spring, deferring grazing in the fall, or during dry summers, can help maximize giant sacaton forage production.1 This site produces a wide variety of trees and shrubs. New Mexico walnut, desert willow and Apacheplume are typically the dominant trees/shrubs. Vegetation communities are largely determined by patterns of periodic overflows. A community dominated by sideoats grama, with blue grama and vine mesquite as sub-dominants, and reduced amounts of giant sacaton, may result from natural fluctuations in the amount of run-in water. Continuous heavy grazing initially causes a decline in the cool season grasses, more desirable warm season

grasses, and the palatable shrubs. Continued loss of grass cover makes this site susceptible to erosion and can facilitate the transition to the Gullied State. Diagnosis: Grass and litter cover is high, with minimal amount of bare ground. Giant sacaton is present. Trees and shrubs, especially New Mexico walnut, desert willow , and Apacheplume are aspect dominants.

Table 5. Ground cover

Tree foliar cover	1-3%
Shrub/vine/liana foliar cover	15-20%
Grass/grasslike foliar cover	35-40%
Forb foliar cover	5-15%
Non-vascular plants	0%
Biological crusts	0%
Litter	25-35%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0-20%
Bedrock	0%
Water	0%
Bare ground	10-15%

Figure 5. Plant community growth curve (percent production by month). NM4605, R070DY155NM Draw Reference State. R070DY155NM Draw Reference State.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	5	7	10	25	25	15	8	2	0

State 2
Gullied State

This state includes gullies.

Community 2.1
Gullied State

Additional States: Gullied State: Loss of grass cover, accelerated erosion, and gully formation characterize this state. Blue grama and sideoats grama are typically the dominant grass species. Giant sacaton may or may not be present. If present it usually exists as small-scattered patches. Diagnosis: Grass cover is typically patchy with large bare areas present. Erosion is evident by the presence of water flow patterns, litter dams, rills, and gullies. Transition to Gullied State (1a) Transitions to the gullied state may occur in response to loss of grass cover, flood events, and subsequent erosion. As grass cover decreases, organic matter and surface soil stability decrease. 2,3 Erosion occurs due to increased water flow volume, decreased soil surface stability, and reduced infiltration. Key indicators of approach to transition: Reduction in grass cover and increase in size and frequency of bare patches. Decreased vigor and cover of giant sacaton Presence of litter dams, water flow patterns, rills and gullies. Transition back to Grass/Shrub -Mix (1b) Erosion control structures or shaping and filling gullies may help regain natural flow patterns and allow natural revegetation to take place. Prescribed grazing will help ensure proper forage utilization and reduce grass loss due to overgrazing.

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				213–628	
	big sacaton	SPWR2	*Sporobolus wrightii*	211–631	–
2				213–415	
	sideoats grama	BOCU	*Bouteloua curtipendula*	211–420	–
3				101–213	
	vine mesquite	PAOB	*Panicum obtusum*	105–211	–
4				101–213	
	Indiangrass	SONU2	*Sorghastrum nutans*	105–211	–
5				101–213	
	western wheatgrass	PASM	*Pascopyrum smithii*	105–211	–
6				45–101	
	squirreltail	ELELE	*Elymus elymoides ssp. elymoides*	43–105	–
7				101–314	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	105–315	–
	silver bluestem	BOSA	*Bothriochloa saccharoides*	105–315	–
	little bluestem	SCSC	*Schizachyrium scoparium*	105–315	–
8				101–213	
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	105–211	–
9				213–527	
	blue grama	BOGR2	*Bouteloua gracilis*	211–526	–
10	**Other Grasses**			101–213	
	littleawn needlegrass	ACLO7	*Achnatherum lobatum*	105–211	–
	big bluestem	ANGE	*Andropogon gerardii*	105–211	–
	threeawn	ARIST	*Aristida*	105–211	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	105–211	–
	sedge	CAREX	*Carex*	105–211	–
	Canada wildrye	ELCA4	*Elymus canadensis*	105–211	–
	plains lovegrass	ERIN	*Eragrostis intermedia*	105–211	–
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	105–211	–
	green sprangletop	LEDU	*Leptochloa dubia*	105–211	–
	common wolfstail	LYPH	*Lycurus phleoides*	105–211	–
	bullgrass	MUEM	*Muhlenbergia emersleyi*	105–211	–
	deergrass	MURI2	*Muhlenbergia rigens*	105–211	–
	Hall's panicgrass	PAHA	*Panicum hallii*	105–211	–
	switchgrass	PAVI2	*Panicum virgatum*	105–211	–
	dropseed	SPORO	*Sporobolus*	105–211	–
	tridens	TRIDE	*Tridens*	105–211	–
Tree					
11				101–314	
	little walnut	JUMI	*Juglans microcarpa*	105–316	–
	little walnut	JUMI	*Juglans microcarpa*	105–315	–
12				22–67	

	hackberry	CELTI	*Celtis*	21–63	–
24	**Other Trees**			22–101	
	juniper	JUNIP	*Juniperus*	21–105	–
	twoneedle pinyon	PIED	*Pinus edulis*	21–105	–
	ponderosa pine	PIPO	*Pinus ponderosa*	21–105	–
Shrub/Vine					
12				101–213	
	desert willow	CHLI2	*Chilopsis linearis*	105–211	–
13				45–78	
	fourwing saltbush	ATCA2	*Atriplex canescens*	38–84	–
14				101–213	
	Apache plume	FAPA	*Fallugia paradoxa*	105–211	–
15				45–101	
	catclaw acacia	ACGR	*Acacia greggii*	43–105	–
16				22–67	
	littleleaf sumac	RHMI3	*Rhus microphylla*	21–63	–
	skunkbush sumac	RHTR	*Rhus trilobata*	21–63	–
17				22–45	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	21–43	–
18				22–78	
	desertbroom	BASA2	*Baccharis sarothroides*	21–84	–
19	**Other Shrubs**			101–213	
	manzanita	ARCTO3	*Arctostaphylos*	105–211	–
	yerba de pasmo	BAPT	*Baccharis pteronioides*	105–211	–
	brickellbush	BRICK	*Brickellia*	105–211	–
	mountain mahogany	CERCO	*Cercocarpus*	105–211	–
	western white clematis	CLLI2	*Clematis ligusticifolia*	105–211	–
	jointfir	EPHED	*Ephedra*	105–211	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	105–211	–
	algerita	MATR3	*Mahonia trifoliolata*	105–211	–
	mariola	PAIN2	*Parthenium incanum*	105–211	–
	mock orange	PHILA	*Philadelphus*	105–211	–
	oak	QUERC	*Quercus*	105–211	–
	willow	SALIX	*Salix*	105–211	–
	western poison ivy	TORY	*Toxicodendron rydbergii*	105–211	–
	canyon grape	VIAR2	*Vitis arizonica*	105–211	–
	yucca	YUCCA	*Yucca*	105–211	–
Forb					
20				22–78	
	globemallow	SPHAE	*Sphaeralcea*	21–84	–
21				22–67	
	white sagebrush	ARLU	*Artemisia ludoviciana*	21–63	–
22				22–67	

	common sunflower	HEAN3	*Helianthus annuus*	21–63	–
23	**Other forbs**			45–101	
	dwarf desertpeony	ACNA2	*Acourtia nana*	43–105	–
	pricklypoppy	ARGEM	*Argemone*	43–105	–
	woolly locoweed	ASMO7	*Astragalus mollissimus*	43–105	–
	whorled milkweed	ASVE	*Asclepias verticillata*	43–105	–
	Indian paintbrush	CASTI2	*Castilleja*	43–105	–
	buckwheat	ERIOG	*Eriogonum*	43–105	–
	blanketflower	GAILL	*Gaillardia*	43–105	–
	cudweed	GNAPH	*Gnaphalium*	43–105	–
	lacy tansyaster	MAPIP4	*Machaeranthera pinnatifida ssp. pinnatifida var. pinnatifida*	43–105	–
	woolly plantain	PLPA2	*Plantago patagonica*	43–105	–
	threadleaf ragwort	SEFLF	*Senecio flaccidus var. flaccidus*	43–105	–
	pricklyleaf dogweed	THAC	*Thymophylla acerosa*	43–105	–
	vervain	VERBE	*Verbena*	43–105	–
	common mullein	VETH	*Verbascum thapsus*	43–105	–

Inventory data references

Data collection for this site was done in
conjunction with the progressive soil surveys
within the Pecos-Canadian Plains and Valleys Major Land Resource Area of New Mexico (MLRA 70).

This site has been mapped and correlated with soils in the following soil surveys:
Otero, Eddy, Chaves, Lincoln

Other references

Other References:

1. Cox, J.R., R.L.Gillen, and G.B. Ruyle. 1989. Big sacaton riparian grassland management: Seasonal grazing effects on plant and animal production. Applied Agricultural
Research. 4(2): 127-134

2. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheet. Rangeland Soil Quality—Aggregate Stability. Rangeland Sheet 3, [Online]. Available:
http://www.statlab.iastate.edu/survey/SQI/range.html

3. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheet. Rangeland Soil Quality—Organic Matter. Rangeland Sheet 6, [Online]. Available:
http://www.statlab.iastate.edu/survey/SQI/range.html

Contributors

David Trujillo
Don Sylvester
John Tunberg

Approval

Kendra Moseley, 10/21/2024

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	05/12/2025
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:**
