USDA Natural Resources
Conservation Service

Ecological site DX035X03A129
Limy

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.

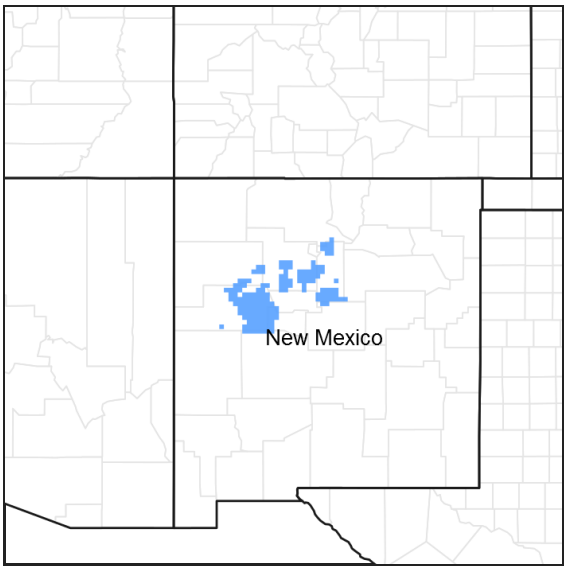


Figure 1. Mapped extent

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.

Table 1. Dominant plant species

Tree	(1) *Juniperus* (2) *Pinus edulis*
Shrub	(1) *Krascheninnikovia lanata* (2) *Atriplex canescens*
Herbaceous	(1) *Pascopyrum smithii* (2) *Bouteloua gracilis*

Legacy ID

R035XG129NM

Physiographic features

This site occurs on moderately sloping valley side slopes. It can also occur as sloping benches or rolling hills above valley bottoms and floodplain positions. Slopes range from 5 to 15 percent. Elevations range from 6,000 to 7,300 feet.

Table 2. Representative physiographic features

Landforms	(1) Fan piedmont (2) Plain
Flooding frequency	None to rare
Ponding frequency	None
Elevation	1,676–2,225 m
Slope	0–10%
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 degree 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 a given range 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.

Table 3. Representative climatic features

Frost-free period (average)	171 days
Freeze-free period (average)	252 days
Precipitation total (average)	406 mm

Influencing water features

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

Soil features

The soils of this site are well drained and moderately deep to deep. The surface textures range from loams to clay loams. Water-holding capacity is moderate to high and permeability is moderate. These soils are typically slightly effervescent on the surface with effervescence increasing with depth. There is a calcareous horizon within 20 inches of the surface that may be weakly cemented. This may affect the rooting depth of the vegetation. These soils are highly susceptible to wind and water erosion.
Characteristic taxonomic units are:
Harvey loam, Flaco cobbly loam, loam

Table 4. Representative soil features

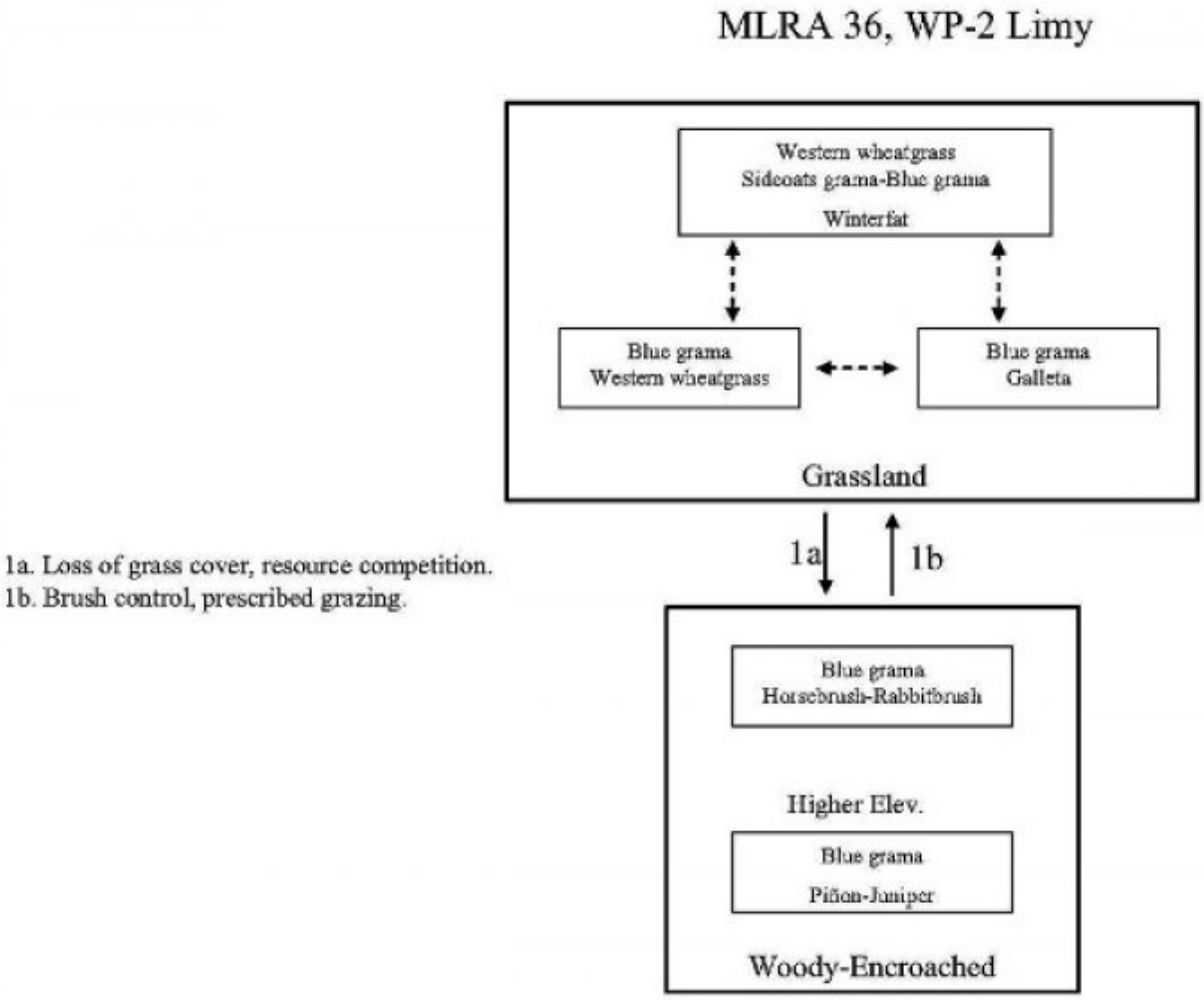
Surface texture	(1) Clay loam (2) Sandy clay loam (3) Very fine sandy loam
Family particle size	(1) Clayey

Drainage class	Well drained
Permeability class	Slow to moderately rapid
Soil depth	51–183 cm
Surface fragment cover <=3"	5–15%
Surface fragment cover >3"	0–3%
Available water capacity (0-101.6cm)	5.08–12.7 cm
Calcium carbonate equivalent (0-101.6cm)	15–30%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	5–20%
Subsurface fragment volume >3" (Depth not specified)	1–3%

Ecological dynamics

Overview:
This site occurs on piedmont slopes, plains, and mesa tops. The soils are moderately deep to deep with a horizon high in calcium carbonate within twenty inches of the surface. This site is often associated with Loamy and Malpais sites. Loamy sites often occur adjacent to, or as inclusions interspersed within Limy sites. On basalt- capped mesas, Malpais sites are occasionally associated with Limy sites. The historic plant community of the Limy site is a grassland characterized by a mixture of cool- and warm-season grasses with occasional shrubs and forbs. Western wheatgrass is the dominant grass, and winterfat is the key shrub species. Overgrazing can reduce grass cover and effect a change in grass species dominance. The loss of grass cover can reduce the competitive influence of grasses and may facilitate the transition to the Woody-Encroached state.

State and transition model



State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

State Containing Historic Plant Community Grassland: Western wheatgrass is the dominant grass of the historic plant community. Other important grasses that occur in significant amounts include sideoats grama, New Mexico feathergrass, needle and thread, blue grama, galleta, and black grama. At higher elevations (usually greater than 6,800 feet), black grama is typically only a minor component while western wheatgrass and blue grama may increase in percent composition. Winterfat is the key woody species for this site. Other species include fourwing saltbush, Bigelow sagebrush, rabbitbrush, spineless horsebrush, cholla and yucca. Piñon and juniper are typically minor components on this site, but may be found at greater densities at higher elevation within the Land Resource Unit. Overgrazing can cause a decrease in western wheatgrass and other cool-season grasses, sideoats grama, winterfat, and fourwing saltbush. Communities dominated by blue grama with western wheatgrass or galleta as the sub-dominant may result. Diagnosis: Grass and litter cover are uniform with few large bare areas present. Evidence of erosion such as pedestalling of plants, rills, and gullies are infrequent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	336	594	852
Shrub/Vine	45	84	112
Forb	31	56	80
Tree	6	11	22
Total	**418**	**745**	**1066**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	10-15%
Forb foliar cover	2-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	10-15%
Surface fragments >0.25" and <=3"	5-15%
Surface fragments >3"	0-3%
Bedrock	0%
Water	0%
Bare ground	45-55%

Figure 5. Plant community growth curve (percent production by month). NM0319, R035XG129NM-Limy-HCPC. WP-2 Limy HCPC.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	10	10	10	20	25	15	5	0	0

State 2
Woody-Encroached

Community 2.1
Woody-Encroached

Additional States: Woody-Encroached: This state is characterized by an increase in woody species, typically spineless horsebrush and or rabbitbrush, and in some instances at higher elevations, piñon and juniper. Blue grama is the dominant grass and galleta and threeawns are sub-dominants. Grass cover decreases as shrub/tree canopy increases. Diagnosis: Grass production and species composition have decreased relative to the Grassland State. Grass and litter cover range from fairly uniform, to patchy with large bare areas present. Evidence of erosion including pedestalling of grasses, elongated water flow patterns, and rills may be common. Transition to Woody-Encroached (1a) Loss of grass cover due to overgrazing and the associated reduced competition by grasses may facilitate woody encroachment.3 Key indicators of approach to transition: * Decrease or change in composition or distribution of grass cover, such as dominance by blue grama. * Increase in size and frequency of bare patches. * Increase in amount of rabbitbrush, horsebrush, or juniper/piñon seedlings. Transition back to Grassland (2b) Brush control is necessary to reduce the competitive influence of shrubs. Some positive results have been reported in controlling rabbitbrush with herbicides.2, 4 Root plowing and other mechanical control methods that sever the plant below the sprouting zone may reduce horsebrush and rabbitbrush densities. Horsebrush and rabbitbrush are fire-adapted species and can quickly increase or occupy a site following fire. Mechanical1, chemical, or a combination can be effective in reducing piñon/juniper densities. Prescribed grazing will help ensure adequate rest following brush control and will assist in the establishment and maintenance of grass cover.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				74–149	
	thickspike wheatgrass	ELLAL	*Elymus lanceolatus ssp. lanceolatus*	74–149	–
	western wheatgrass	PASM	*Pascopyrum smithii*	74–149	–
2				74–111	
	blue grama	BOGR2	*Bouteloua gracilis*	74–111	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	74–111	–
3				74–149	
	needle and thread	HECO26	*Hesperostipa comata*	74–149	–
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	74–149	–
4				37–74	
	James' galleta	PLJA	*Pleuraphis jamesii*	37–74	–
5				22–37	
	alkali sacaton	SPAI	*Sporobolus airoides*	22–37	–
6				22–37	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	22–37	–
7				22–37	
	squirreltail	ELEL5	*Elymus elymoides*	22–37	–
8				22–37	
	common wolfstail	LYPH	*Lycurus phleoides*	22–37	–
	spike dropseed	SPCO4	*Sporobolus contractus*	22–37	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	22–37	–
9				74–111	
	sideoats grama	BOCU	*Bouteloua curtipendula*	74–111	–
10				37–74	
	black grama	BOER4	*Bouteloua eriopoda*	37–74	–
Shrub/Vine					
11				37–74	
	winterfat	KRLA2	*Krascheninnikovia lanata*	37–74	–
12				8–37	
	fourwing saltbush	ATCA2	*Atriplex canescens*	8–37	–
13				8–22	
	jointfir	EPHED	*Ephedra*	8–22	–
14				8–37	
	Bigelow sage	ARBI3	*Artemisia bigelovii*	8–37	–
15				8–22	
	rubber rabbitbrush	ERNAN5	*Ericameria nauseosa ssp. nauseosa var. nauseosa*	8–22	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	8–22	–

	broom snakeweed	GUSA2	Gutierrezia sarothrae	8–22	–
	spineless horsebrush	TECA2	*Tetradymia canescens*	8–22	–
Tree					
16				8–22	
	juniper	JUNIP	*Juniperus*	8–22	–
	twoneedle pinyon	PIED	*Pinus edulis*	8–22	–
Forb					
18				8–59	
	Forb, perennial	2FP	*Forb, perennial*	8–59	–
19				8–37	
	Forb, annual	2FA	*Forb, annual*	8–37	–

Animal community

This range site provides a habitat, which supports a resident animal community characterized by pronghorn antelope, blacktailed jackrabbit, badger, Gunnison's prairie dog, mourning dove, prairie rattlesnake, and American bison. The common raven, prairie falcon, and Mexican eagle hunt over this site. Mule deer feed on the site.

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
Ildefonso----------B
Falco----------C

Recreational uses

This site offers fair to good potential for hiking, horseback riding, nature observation, and photography. Camping is limited due to the lack of water and shade. Hunting for antelope and small game is good. During years of abundant rainfall, the natural beauty is enhanced by an array of colorful wildflowers.

Wood products

Under the potential vegetative community, this site has little potential for wood products. However, in areas where pinyon and juniper have increased there is a limited potential for fencing material and fuelwood.

Other products

This site is suitable for grazing by all kinds and classes of livestock during all seasons of the year but is poorly suited to continuous year-long use. Species such as western wheatgrass, New Mexico feathergrass, sideoats grama, winterfat, and fourwing saltbush will decrease. They will be replaced by blue grama, broom snakeweed, yucca, and cholla. Continued deterioration of the site can cause severe erosion. This site responds best to a system of grazing that rotates the season of use. In some areas, pinyon and juniper have increased on this site and may appear as even-aged, long-lived stands.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity----------Index Ac/AUM
100 - 76----------3.3-4.6
75 – 51----------4.4-6.8
50 – 26----------6.5-11.0
25 – 0----------11.0+

Other references

1. Brockway, D.G., R.G. Gatewood, and R.B. Paris. 2002. Restoring grassland savannas from degraded pinyon-juniper woodlands: effects of mechanical overstory reduction and slash treatment alternatives. Journal of Environmental Management. 64: 179-197.

2. Cluff, G.J., B.A. Roundy, R.A. Evans, and J.A. Young. 1983. Herbicidal control of greasewood (Sarcobatus vermiculatus) and salt rabbitbrush (Chrysothamnus nauseosus ssp. consimilis). Weed Science. 31: 275-279.

3. Johnsen, T.N., Jr. 1962. One-seeded juniper invasion of northern Arizona grasslands. Ecological Monographs. 32:187-207.

4. Whisenant, S.G. 1988. Control of threadleaf rubber rabbitbrush with herbicides. Journal of Range Management. 41: 470-472

Data collection for this site was done in conjunction with the progressive soil surveys within the New Mexico and Arizona Plateaus & Mesas Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: McKinley, Catron, Cibola, Socorro and Sandoval.

Contributors

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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:**

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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):**

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:**