

Ecological site R036XB005NM

Limy

Last updated: 4/01/2025
Accessed: 09/22/2026

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): 036X–Southwestern Plateaus, Mesas, and Foothills

R036XB005NM – Limy is an ecological site that is alluvial fans and valley sides in MLRA 36 (Southwestern Plateaus Mesas and Foothills). The southern portion MLRA 36 is illustrated yellow color on the map where this site occurs. The site concept was established in the Southwestern Plateaus, Mesas, and Foothills – Warm Semiarid Mesas and Plateaus LRU (Land Resource Area). This LRU has 10 to 16 inches of precipitation and has a mesic temperature regime. Lower part of MLRA 36 is dominated by summer precipitation for monsoons, unlike the upper part of MLRA 36 which is almost an equal split.

Classification relationships

NRCS & BLM: Major Land Resource Area 36, Southwestern Plateaus Mesas and Foothills (United States Department of Agriculture, Natural Resources Conservation Service, 2006). USFS: 313Bd Chaco Basin High Desert Shrubland and 313Be San Juan Basin North subsections 313B Navaho Canyonlands Section 313 Colorado Plateau Semi-Desert (Cleland, et al., 2007). 315Ha Central Rio Grande Intermontane, and 315Hb North Central Rio Grande Intermontane subsections 315H Central Rio Grande Intermontane Section 315 Southwest Plateau and Plains Dry Steppe and Shrub (Cleland, et al., 2007). 315Ad Chupadera High Plains Grassland subsections 315A Pecos Valley Section 315 Southwest Plateau and Plains Dry Steppe and Shrub (Cleland, et al., 2007). 331Jb San Luis Hills and 331Jd Southern San Luis Grasslands subsections 331J Northern Rio Grande Basin Section 331 Great Plains- Palouse Dry Steppe (Cleland, et al., 2007). M313Bd Manzano Mountains Woodland subsection Sacramento-Monzano Mountains Section M313 Arizona-New Mexico Mountains Semi-Desert - Open Woodland - Coniferous Forest - Alpine Meadow (Cleland, et al., 2007). M331Fg Sangre de Cristo Mountains Woodland and M331Fh Sangre de Cristo Mountains Coniferous Forest subsection M331F Southern Parks and Rocky Mountain Range Section M331 Southern Rocky Mountain Steppe - Open Woodland - Coniferous Forest - Alpine Meadow M331Gk Brazos Uplift and M331Gm Jemez and San Pedro Mountains Coniferous Forest subsections M331G South Central Highlands Section M331 Southern Rocky Mountain Steppe - Open Woodland - Coniferous Forest - Alpine Meadow (Cleland, et al., 2007). EPA: 21d Foothill Shrublands and 21f Sedimentary Mid-Elevation Forests 21 Southern Rockies 6.2 Western Cordillera 6 Northwestern Forested Mountains (Griffith, 2006). 20c Semiarid Benchlands and Canyonlands 20 Colorado Plateaus 10.1 Cold Deserts 10 North American Deserts (Griffith, 2006). 22m Albuquerque Basin, 22i San Juan/Chaco Tablelands and Mesas, 22h North Central New Mexico Valleys and Mesas, 22f Taos Plateau, and 22g Rio Grande Floodplain, 22 Arizona/New Mexico Plateau 10.1 Cold Deserts 10 North American Deserts (Griffith, 2006). USGS: Colorado Plateau Province (Navajo and Datil Section) Southern Rocky Mountains Basin and Range (Mexican Highland and Sacramento Section)

Ecological site concept

The 36XB ecological site was drafted from the existing R036XB005NM – Limy range site MLRA 36XB (NRCS, 2003). This site is commonly located on alluvial fans and valley sides. The soils typically are very calcareous throughout the profile. Surface textures are generally a silt loam. Surface texture clay is about 22% on average. It has an aridic ustic/ustic arid moisture regime and mesic temperature regime. The effective precipitation ranges from 10 to 16 inches.

Associated sites

R036XB018NM	Stony Loam Stony Loam - Slopes 0-15%; soils are deep to very deep and skeletal and non-skeletal; Surface soil textures are cobbly loam, or loam. Subsoils are loamy. Landforms are nearly level alluvial fans, stream terraces, plateaus, mesas and volcanic cones.
F036XA001NM	Pinyon Upland Pinyon Upland (Formerly South of Gallup 13-16")- Soils are very shallow to shallow and non-skeletal; soil surface is loam, channery loam or clay loam. Landforms are broad mesas, cuestras, and hills interspersed with numerous deep canyons and dry washes.
R036XB017NM	Swale Swale - This site is enhanced by runoff during periods of high runoff (intermittent). The water table depth is greater than 6 ft. Soils are deep to very deep soils that have surface textures of loams, silt loams to clays with loamy subsoil. Landforms are broad valley bottoms, floodplains, and in depressions.
R036XB006NM	Loamy Loamy - Slopes 1-15%; soils are very shallow to shallow and skeletal and not skeletal; soil surface are loam, stony to very stony loam, very cobbly loam, fine sandy loam, very cobbly fine sandy loam, stony silt loam, stony silty clay loam, and cobbly silty clay loam; Parent materials are basalt influences but can have sometimes influence from sandstone and/or shale. Landforms nearly level to gently sloping mesas, lava plateaus, lava flows, lava flows on valley floors, and ridges.

Similar sites

R036XB002NM	Clayey Clayey - Slopes are 0-15%; Soils are moderately deep to deep; soil surface loam, clay loam, silty clay loam, and silty clay over clayey subsoil with textures of clay loam, clay to silty clay loam or silty clay. Landforms are stream terraces, valley floors, fan remnants, alluvial fans, dipslopes on cuestras, mesas, hills, and valley floors.
R036XB006NM	Loamy Loamy - Slopes 1-15%; soils are very shallow to shallow and skeletal and not skeletal; soil surface are loam, stony to very stony loam, very cobbly loam, fine sandy loam, very cobbly fine sandy loam, stony silt loam, stony silty clay loam, and cobbly silty clay loam; Parent materials are basalt influences but can have sometimes influence from sandstone and/or shale. Landforms nearly level to gently sloping mesas, lava plateaus, lava flows, lava flows on valley floors, and ridges.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on nearly level to gently alluvial fans and valley sides. Slopes vary from 3 to 8 percent. Elevation ranges from 6,900 to 8,400 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Valley side
Flooding frequency	None
Ponding frequency	None
Elevation	2,100 – 2,320 m
Slope	0 – 10 %
Aspect	Aspect is not a significant factor

Climatic features

This site has a semi-arid continental climate. There are distinct seasonal temperature variations. Mean annual precipitation varies from 10 to 16 inches. The overall climate is characterized by cold dry winters in which winter moisture is less than summer. Wide yearly and seasonal fluctuations are common for this climatic zone which can range from 5 to 25 inches. Of this, approximately 25-35% falls as snow, and 65-75% falls as rain between April 1 and November 1. The growing season is April through September. As much as half or more of the annual precipitation can be expected to come during the period of July through September. August is typically the wettest month of the year. The driest period is usually from November to April; and February is normally the driest month. During July, August, and September, 4 to 6 inches of precipitation influence the presence and production of warm-season plants. Fall and spring moisture is conducive to the growth of cool-season herbaceous plants and maximum shrub growth. Growth usually begins in March and ends with plant maturity and seed dissemination when the moisture deficiency and warmer temperatures occur in early June. There is also a period of growth in the fall. Summer precipitation is characterized by brief thunderstorms, normally occurring in the afternoon and evening. Winter moisture usually occurs as snow, which seldom lies on the ground for more than a few days. The average annual total snowfall is 29.1 inches. The snow depth usually ranges from 0 to 1 inches during the winter months. The highest snowfall record is 57.1 inches during the 1993-1994 winter. The frost-free period typically ranges from 110 to 145 days and the freeze free period is from 140 to 170 days. The last spring freeze is the middle of April to the first week of May. The first fall freeze is the middle of October to the first week of November. Mean daily annual air temperature is about 29°F to 69°F, averaging about 37°F for the winter and 67°F in the summer. The coldest winter temperature recorded was -20°F on January 6, 1971 and the warmest winter temperature recorded was 70°F on February 28, 1965. The coldest summer temperature recorded was 26°F on June 1, 1980. The hottest day on record is 100°F on July 9, 2003 and June 21, 1968. Data taken from Western Regional Climate Center (2017) for El Rito, New Mexico Climate Station.

Table 3 Representative climatic features

Frost-free period (average)	130 days
Freeze-free period (average)	150 days
Precipitation total (average)	330 mm

- (2) EL RITO [USC00292820], El Rito, NM
- (3) SANTA FE 2 [USC00298085], Santa Fe, NM
- (4) ABIQUIU DAM [USC00290041], Gallina, NM
- (5) CUBA [USC00292241], Cuba, NM
- (6) LYBROOK [USC00295290], Dulce, NM
- (7) NAVAJO DAM [USC00296061], Navajo Dam, NM

Influencing water features

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

Soil features

The soils are deep and well drained. The soils typically are very calcareous throughout the profile. Surface textures are generally a silt loam. Surface texture clay is about 22% on average. Subsoils are silt loam to loam. The clay percentage at 20 inches in depth averages 28%. The parent material consists of fan alluvium derived from limestone and sandstone or alluvium derived from sandstone and shale.

This site is found in NM650, NM678, NM698 and NM672 soil survey. This ecological site has been correlated to the following soils with the listed particle control sections:

Fine-Loamy:
Berryman

Table 4. Representative soil features

Parent material	(1) Alluvium – limestone and sandstone (2) Alluvium – sandstone and shale
Surface texture	(1) Silt loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	150 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	22.86 – 30.48 cm
Electrical conductivity (0-101.6cm)	Not specified

Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 8.9
Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

MLRA 36 occurs on the higher elevation portion of the Colorado Plateau. The Colorado Plateau is a physiographic province which exists throughout eastern Utah, western Colorado, western New Mexico and northern Arizona. It is characterized by uplifted plateaus, canyons and eroded features. The Colorado Plateau lies south of the Uintah Mountains, north of the Mogollon transition area, west of the Rocky Mountains, and east of the central Utah highlands. The higher elevation portion of the Colorado Plateau which is represented by MLRA 36 is characterized by broken topography, and lack of perennial water sources. This area has a long history of past prehistoric human use for years. MLRA 36 shows archaeological evidence indicating that pinyon-juniper woodlands were modified by prehistoric humans and not pristine and thus were altered at the time of European settlement (Cartledge & Propper, 1993). This area also included natural influences of herbivory, fire, and climate. This area rarely served as habitat for large herds of native herbivores or large frequent historic fires due to the broken topography. This site is extremely variable and plant community composition will vary with the water fluctuations on this site.

The lower part MLRA 36 developed under climatic conditions that include hot, dry summers with summer rains showers and little to no snow with the mild winter temperatures. This area has climatic fluctuations and prolonged droughts are common occurrences. Between an above average year and a drought year. Forbs are the most dynamic component of this community and can vary up to 4 fold (Passey et.al. 1982). The precipitation and climate of MLRA 36 are conducive to producing Pinyon/juniper, and sagebrush complexes with high productive sites in the bottoms of the canyons. Predominant species on the Colorado Plateau are Wyoming big sagebrush (*Artemisia tridentata* var. *wyomingensis*), mountain big sagebrush (*A. tridentata* var. *vaseyana*), and black sagebrush (*A. nova*), basin big sagebrush (*A. tridentata* var. *tridentata*), Utah juniper (*Juniperus utahensis*), one-seed juniper (*Juniperus monosperma*), and two-needle pinyon (*Pinus edulis*). One-seed juniper has the capability to discontinue active growth when moisture is limited but can resume growth when moisture availability improves. This growth pattern may represent an important adaptation allowing them to survive on very arid sites.

The ability for an ecological site to carry fire depends primarily on the present fuel load and plant moisture content—sites with small fuel loads will burn more slowly and less intensely than sites with large fuel loads. Fire is an important aspect of grass dominated ecological sites. LANDFIRE modelled southwest desert grasslands fire return interval as 10 to 833 years (USFS, 2012). Historically, fires were of mixed severity, and various patchy sizes which formed mosaics. Fires varied in intensity and frequency depending on the site's productivity. So, the variability in severity, patchy sizes, intensity and frequency has led to large variabilities in the fire regimes and fire return intervals.

Shrub vegetation is able to reestablish from seed dispersal from the adjacent non burned shrub stands; however the process is relatively slow. Fire also decreases the extent of One-seed juniper/pinyon pine invasions, which allows the historic plant community to maintain integrity. When the plant community is burned shrubs decrease, while perennial and annual grasses increase. The perennial shrubs associated with this site are able to recover at a faster rate than the invading trees. When the site is degraded by the presence of invasive annuals, the fire return interval is shortened due to increased fuels. The shortened fire return interval is often sufficient to suppress the native plant community.

Variability in climate, soils, aspect and complex biological processes will cause the plant communities to differ. These factors contributing to annual production variability include wildlife use, drought, and insects. Factors contributing to special variability include soil texture, depth, rock fragments, slope, aspect, and micro-topography. The species lists are representative and not a complete list of all occurring or potentially occurring species on this site. The species lists are not intended to cover the full range of conditions, species and responses of the site. The State & Transition model depicted for this site is based on available research, field observations and interpretations by

experts and could change as knowledge increases. As more data is collected, some of these plant communities may be revised or removed, and new ones may be added. The following diagram does not necessarily depict all the transitions and states that this site may exhibit, but it does show some of the most common plant communities.

State and transition model

Figure 5. STM

Figure 6. Legend

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (t/ha)	Foliar Cover (%)
Grass/Grasslike					
1				123-155	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	123-155	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	123-155	–
2				31-49	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	31-49	–
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	31-49	–
3				31-49	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	31-49	–
4				19-44	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	19-44	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	19-44	–
5				19-31	
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	19-31	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	19-31	–
Forb					
6				19-44	
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	19-44	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	19-44	–
	buckwheat	ERIOG	<i>Eriogonum</i>	19-44	–
	woolly plantain	PLPA2	<i>Plantago patagonica</i>	19-44	–
Shrub/Vine					
7				151-216	
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	151-216	–
8				19-31	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	19-31	–
9				19-31	
	rubber rabbitbrush	ERNAN5	<i>Ericameria nauseosa</i> ssp. <i>nauseosa</i> var. <i>nauseosa</i>	19-31	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	19-31	–
10				7-31	
	Shrub, deciduous	2SD	<i>Shrub, deciduous</i>	7-31	–
	yucca	YUCCA	<i>Yucca</i>	7-31	–

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 2.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 11. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 12. Community 3.2 plant community composition

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

Habitat for Wildlife: This site provides habitats which support a resident animal community that is characterized by pronghorn antelope, coyote, white-tailed jackrabbit, deer mouse, horned lark, and prairie rattlesnake. Typical summer resident birds include vesper, sage, and brewer sparrows and sage thrashers. Antelope were absent from approximately 1910 until the early 1940's when wild captured animals were transplanted. Mule deer and elk will forage seasonally around the periphery of this site. Bald eagles and peregrine falcons may use this site for hunting when it is located near the Rio Grande Gorge.

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 Berryman

Recreational uses

This site has little recreational value other than horseback riding and hunting. It has little aesthetic appeal and natural beauty.

Wood products

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

Other products

Grazing: Approximately 85 percent of the vegetation produced on this site is suitable for grazing or browsing by domestic livestock and wildlife. Grazing distribution generally is not a problem if adequate waterings are provided. Continuous grazing leads to a repetitive, selective grazing of the most desirable species which reduces their vigor and productivity. The result is a deterioration of the potential plant community. Winterfat is especially susceptible to reduced vigor as a result of continuous winter grazing. Continuous summer grazing is detrimental to the perennial grass component. A planned grazing system, which prevents the repetitive grazing of selected species and allows periodic replenishment of root carbohydrates, is desirable.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month Similarity Index-----Ac/AUM 100 - 76-----4.2 – 5.6 75 – 51-----5.5 – 8.3 50 – 26-----8.2 – 16.6 25 – 0-----16.6+

Type locality

Location 1: Taos County, NM

Other references

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Contributors

Don Sylvester
Elizabeth Wright
John Tunberg
Michael Carpinelli
Suzanne Mayne Kinney

Approval

Kirt Walstad, 4/01/2025

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Project Staff: Suzanne Mayne-Kinney, Ecological Site Specialist, NRCS MLRA, Grand Junction Colorado SSO Chuck Peacock, MLRA Soil Survey Leader, NRCS MLRA Grand Junction Colorado SSO Alan Stuebe, MLRA Soil Survey Leader, NRCS MLRA Alamosa Colorado SSO Program Support: Brenda Simpson, NRCS NM State Rangeland Management Specialist, Albuquerque, NM Scott Woodhall, NRCS MLRA Ecological Site Specialist-QA Phoenix, AZ Eva Muller, Regional Director, Rocky Mountain Regional Soil Survey Office, Bozeman, MT Rick Strait, NM State Soil Scientist, Albuquerque, NM Steve Kadas, CO State Resource Conservationist, Albuquerque, NM --Site Development and Testing Plan--: Future work to validate and further refine the information in this Provisional Ecological Site Description is necessary. This will include field activities to collect low-, medium-, and high-intensity sampling, soil correlations, and analysis of that data. Additional information and data is required to refine the Plant Production and Annual Production tables for this ecological site. The extent of MLRA 36 must be further investigated. Field testing of the information contained in this Provisional ESD is required. As this ESD is moved to the Approved ESD level, reviews from the technical team, quality control, quality assurance, and peers will be conducted.

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	01/16/2025
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):

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:
