

Ecological site R036XB138NM

Marshy

Last updated: 1/16/2025
Accessed: 10/05/2026

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

R036XB138NM – Marshy is an ecological site that on abandoned channels on flood plains of valley floors 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 R036XB008NM – Meadow range site MLRA 36XB (NRCS, 2003). This site is commonly located on abandoned channels on flood plains of valley floors. The soils are deep, very poorly drained. The seasonal water table fluctuates between 0 and 5 inches for most of the growing season. The surface layer texture is usually a silt loam with 8% clay on average. The subsoils are coarse-loamy textured. The subsurface is usually a silt loam, fine sandy loam, loamy sand, coarse sand, gravelly coarse sand and gravelly loamy coarse sand with approximately 14% clay. It has an aridic ustic/ustic arid moisture regime and mesic temperature regime. The effective precipitation ranges from 10 to 16 inches.

Associated sites

F036XA005NM	Riverine Riparian Site has a water table at 12-36" Landforms are V-shaped valleys, U-shaped valleys and Overflow Stream (channel).
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Similar sites

R036XB017NM	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.
F036XA005NM	Riverine Riparian Site has a water table at 12-36" Landforms are V-shaped valleys, U-shaped valleys and Overflow Stream (channel).
R036XB008NM	Meadow Water table 28-72" in depth; slopes 1-5%; soils are deep, Surface textures are silty clay loam, and clay loam with a subsoil of stratified loams, silt loams, silty clay loams, clay loams, very gravelly sand and gravelly sand. Landform is nearly level to gently sloping floodplains.
R036XB009NM	Salt Meadow Water table 36-72" in depth; slopes are 1-5%; soils are deep, Surface textures are loam, fine sandy loam, clay loam, silty clay loam with a subsoil of clay or clay loam. Landform is nearly level to gently sloping floodplains. This site is dependent on sub-irrigation and overflow for its moist condition. This site is affected by sodium

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Carex</i> (2) <i>Juncus</i>

Physiographic features

This site is located on abandoned channels on flood plains of valley floors with intermittent streams. They formed in alluvium derived from Precambrian granite, gneiss, and schist and Tertiary micaceous sandstone and siltstone. Slopes are 0 to 1 percent. Elevation ranges from 5,500 to 6,600feet.

Table 2. Representative physiographic features

Landforms	(1) Valley floor (2) Channel (3) Marsh
Flooding duration	Extremely brief (0.1 to 4 hours)
Flooding frequency	None to occasional
Ponding duration	Very long (more than 30 days)
Ponding frequency	Frequent
Elevation	1,680 – 2,010 m
Slope	0 %
Ponding depth	0 – 10 cm
Water table depth	0 – 10 cm
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
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Freeze-free period (average)	150 days
Precipitation total (average)	330 mm

- (1) SANTA FE 2 [USC00298085], Santa Fe, NM
- (2) CUBA [USC00292241], Cuba, NM
- (3) ABIQUIU DAM [USC00290041], Gallina, NM
- (4) COCHITI DAM [USC00291982], Pena Blanca, NM
- (5) EL RITO [USC00292820], El Rito, NM
- (6) LYBROOK [USC00295290], Dulce, NM
- (7) NAVAJO DAM [USC00296061], Navajo Dam, NM

Influencing water features

Slightly concave abandoned channel of a flood plain sloping 1 percent to the northwest at 6,220 feet elevation--wet meadow. Soil moisture - The soil moisture control section is wet throughout the year. The soil moisture regime is peraquic.

Very poorly drained; high surface runoff; moderate and moderately rapid permeability in the upper part of the profile and rapid and very rapid permeability in the lower part of the profile. These soils are subject to occasional, extremely brief periods of flooding between July and September. Floodwaters have low velocity and are generally less than 1 foot deep. A seasonal high water table is present between the soil surface and 1.0 foot.

Soil features

Soils are very deep (60+ inches). These soils are coarse-loamy textured. The soils are dark in color for the organic matter that occurs on this site. This site may have a peat layer occurring. Redox features are commonly found in the soils between 0 and 2 inches in depth. The surface layer texture is usually a silt loam with 8% clay on average. The subsoils are coarse-loamy textured. The subsurface is usually a silt loam, fine sandy loam, loamy sand, coarse sand, gravelly coarse sand and gravelly loamy coarse sand with approximately 14% clay.

The soils show signs of poor drainage. They are wet most of the year, but in late summer they may show signs of drought. The variability of the duration and height of the water table causes considerable variation in plant growth over the site. The parent materials are micaceous alluvium derived from sandstone and siltstone and/or alluvium derived from granite and/or alluvium derived from gneiss and/or alluvium derived from schist and/or alluvium derived from micaceous sandstone and siltstone, and granite, gneiss, or schist. The soil moisture and temperature regimes are ustic aridic and mesic respectively.

This site is found in NM672, NM678, NM686 and NM687 soil survey. This ecological site has been correlated to the following soils with the listed particle control sections:

Coarse-Loamy
Mirada

Table 4. Representative soil features

Parent material	(1) Alluvium – sandstone and siltstone (2) Alluvium – granite (3) Alluvium – gneiss
Surface texture	(1) Silt loam (2) Fine sandy loam
Family particle size	(1) Sandy

Drainage class	Very poorly drained
Permeability class	Moderate to moderately rapid
Soil depth	150 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	10.16 – 20 cm
Calcium carbonate equivalent (0-101.6cm)	10 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	10 – 8.6
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
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. It is possible that small trees may be killed by drought; mature one-seed junipers are resilient to drought, especially in comparison to two-needle pinyon (Johnsen, 1962).

The productivity and composition of this plant community would have been quite stable, although varying with the climate because it would have been affected by runoff from streams originating at higher elevations in adjacent mountains. The water table usually persisted throughout the year, causing poorly-aerated soils. The water table is fed by spring snow melt, groundwater and monsoonal rains. Following very wet winters, the melting snow pack would have caused a high and widespread surge of flooding. Wet meadows are areas where it floods frequently or has a shallow water table with some wetland properties. Wet Meadows are a small portion of the landscape footprint. Less than 1% of the landscape in the southwest are characterized as wetlands and wet meadows is just one of several wetland types that occur (Ramstead, 2012). This site is important part of the landscape as it often serves as habitat for plants, birds and other wildlife.

Wet meadows in the southwest are one of the most altered ecosystem types by humans. They are used for livestock and wildlife grazing, many locations have small dams with ponds or stock tanks. In irrigated meadows, roads are commonly built through or adjacent to them, they are prone to invasive species and can be impacted by wildfires in the surrounding upland areas. (Ramstead et al., 2012)

Meadows with tufted hairgrass as a major component are very sensitive to water table fluctuations. A study in Oregon showed that when the water table is lowered it favored increases in Kentucky bluegrass and perennial forbs in the species composition. While increase in the water table favored sedges and rush establishment. (Walsh, 1995) In the mountain west, Kentucky bluegrass is well adapted to the meadow with seasonally high water tables and midsummer drought. Kentucky bluegrass has become dominated on many meadows which once had a larger component of tufted hairgrass. (Uchytel, 1993)

Records of fire with wet meadows at lower elevations are rare to non-existent. The communities listed do not include wet meadows for fire regimes. In general, Intermountain riparian communities have been found to have a fire interval of 20 to 370 years (USDA, 2012a). While southwestern desert grasslands have a fire interval of 10-833 years (USDA, 2012b). Another source states that meadows have a fire return interval of 30 to 60 years (Landfire, 2007). The second source covers 2 ecological sites. It covers the upper precipitation end of wet meadow, and mountain meadows ecological site from an adjacent MLRA (48A). This site is not described in the fire regime literature that is available at this time. The data available is for general vegetation types in the United States: no specific data for wet meadows on Colorado Plateau is available at this time.

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 ()	Foliar Cover (%)
Grass/Grasslike					

1	Rushes			616-729	
	rush	JUNCU	<i>Juncus</i>	616-729	–
2	Sedge			510-577	
	Geyer's sedge	CAGE2	<i>Carex geyeri</i>	504-577	–
	Nebraska sedge	CANE2	<i>Carex nebrascensis</i>	510-577	–
	sedge	CAREX	<i>Carex</i>	510-577	–
3	Western Wheatgrass			577-785	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	577-785	–
4	Bluejoint			622-689	
	bluejoint	CACA4	<i>Calamagrostis canadensis</i>	622-689	–
5	other grasses			112-224	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-56	–
	oatgrass	DANTH	<i>Danthonia</i>	0-56	–
	tufted hairgrass	DECE	<i>Deschampsia cespitosa</i>	0-56	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0-56	–
	beardless wildrye	LETR5	<i>Leymus triticoides</i>	0-56	–
Forb					
6				56-224	
	western yarrow	ACMIO	<i>Achillea millefolium var. occidentalis</i>	0-56	–
	rosy pussytoes	ANRO2	<i>Antennaria rosea</i>	0-56	–
	Chamisso arnica	ARCH3	<i>Arnica chamissonis</i>	0-56	–
	silverweed	ARGEN	<i>Argentina</i>	0-56	–
	aster	ASTER	<i>Aster</i>	0-56	–
	bedstraw	GALIU	<i>Galium</i>	0-56	–
	cinquefoil	POTEN	<i>Potentilla</i>	0-56	–
	buttercup	RANUN	<i>Ranunculus</i>	0-56	–

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

Highly productive site providing feed and habitat to livestock and wildlife.

Hydrological functions

Located adjacent to abandoned channels on flood plains of valley floors with intermittent streams. Very poorly drained; high surface runoff; moderate and moderately rapid permeability in the upper part of the profile and rapid and very rapid permeability in the lower part of the profile. These soils are subject to occasional, extremely brief periods of flooding between July and September. Floodwaters have low velocity and are generally less than 1 foot deep. A seasonal high water table is present between the soil surface and 1.0 foot.

Recreational uses

Bird watching would be particularly productive on this site.

Wood products

No known wood products.

Inventory data references

TYPE LOCATION: Santa Fe County, New Mexico; on the Tesuque Indian Reservation about 0.25 mile west-southwest of Camel Rock; USGS Tesuque 7.5 minute topographic quadrangle; 900 feet west and 1,350 feet south of the northeast corner of section 4, T.18N., R.9E.; Latitude 35 degrees 49 minutes 23 seconds North and Longitude 105 degrees 59 minutes 5 seconds West, NAD 27.

Other references

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Acknowledgments

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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	01/16/2025
Approved by	
Approval date	

Composition (Indicators 10 and 12) based on	Annual Production
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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:
