USDA Natural Resources Conservation Service

Ecological site R048AY005NM
Mountain Malpais

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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.

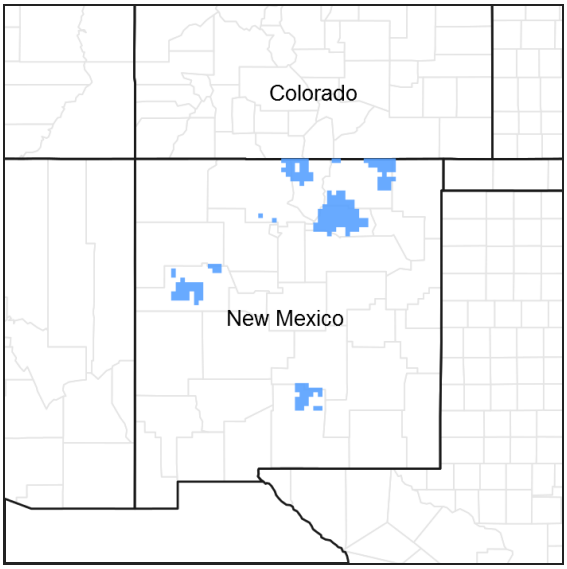

Figure 1. Mapped extent

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.

MLRA notes

Major Land Resource Area (MLRA): 048A–Southern Rocky Mountains

This area is in Colorado (76 percent), New Mexico (11 percent), Utah (8 percent), and Wyoming (5 percent). It makes up about 45,920 square miles (119,000 square kilometers). The towns Jemez Springs, Los Alamos, Red River and Eagle Nest, New Mexico, are in this MLRA. This MLRA has numerous national forests, the Carson National Forest and part of the Santa Fe National Forest in New Mexico. The Jemez, Picuris, Santa Clara, and Taos Indian Reservations are in this MLRA. Most of this area is in the Southern Rocky Mountains Province of the Rocky Mountain System. Small parts of the southwest corner and some isolated areas farther west are in the Canyon Lands Section of the same province and division. The Southern Rocky Mountains consist primarily of two belts of strongly sloping to precipitous mountain ranges trending north to south. Several basins, or parks, are between the belts. The ranges include the Sangre de Cristo Mountains, Jemez Mountains, and Tusas Mountains. Elevation typically ranges from 6,500 to 13,167 feet (1,980 to 1,039 meters) in this area. The Rio Grande is a National Wild and Scenic River in northern New Mexico, which is in the southern part of this MLRA.

The mountains in this area were formed mainly by crustal uplifts during the late Cretaceous and early Tertiary periods. The rocks exposed in the mountains are mostly Precambrian igneous and metamorphic rocks, which in many places are flanked by steeply dipping Mesozoic sedimentary rocks. Younger igneous rocks, primarily basalt and andesitic lava flows, tuffs, breccias, and conglomerates, are throughout this area. Representative formations in this area are the Silver Plume and Pikes Peak granites, San Juan Volcanics, and Mancos Shale. Many of the

highest mountain ranges were reshaped by glaciation during the Pleistocene. Alluvial fans at the base of the mountains are recharge zones for local basin and valley fill aquifers. They also are important sources of sand and gravel.

The dominant soil orders in this MLRA are Mollisols, Alfisols, Inceptisols, and Entisols. The soils in the area dominantly have a frigid or cryic soil temperature regime and an ustic or udic soil moisture regime. Mineralogy is typically mixed, smectitic, or paramicaceous. In areas with granite, gneiss, and schist bedrock, Glossocryalfs (Seitz, Granile, and Leadville series) and Haplocryolls (Rogert series) formed in colluvium on mountain slopes. Dystrocryepts (Leighcan and Mummy series) formed on mountain slopes and summits at the higher elevations. In areas of andesite and rhyolite bedrock, Dystrocryepts (Endlich and Whitecross series) formed in colluvium on mountain slopes. In areas of sedimentary bedrock, Haplustolls (Towave series) formed on mountain slopes at low elevations and with low precipitation. Haplocryolls (Lamphier and Razorba series), Argicryolls (Cochetopa series), and Haplocryalfs (Needleton series) formed in colluvium on mountain slopes at high elevations

LRU notes

This site is part of the RM-1 sub-resource area. This site is found on the east side of Sangre de Cristo mountains.

Classification relationships

This ecological site is correlated to soil components at the Major Land Resource Area (MLRA) level which is further described in USDA AgHandbook 296.

Ecological site concept

This site is characterized by flat to moderately steep topography. It is frequently found as mesa, mountains slopes and ridges where the basalt caps are present. The site's terrain may be interrupted by extrusions of the basalt, leaving a rough or choppy appearance to the topography. The basaltic stone cover typically exists over a portion of the site where igneous extrusions occur. Boulders on the surface are common. The dominant slope range is from 3 to 30 percent, but it some site range up to 55 percent. The exposure varies but has little significance on plant production. Elevation ranges from 6,800 to 9,000 feet above sea level.

These soils are well drained, very shallow to shallow,and formed in debris from basalt and other volcanic rock or metamorphic rock. The surface texture is cobbly, very cobbly silt loam; stony, very stony, very cobbly loam; stony, very stony silt loam; and cobbly sandy loam.

The texture of the subsoil layers range from very stony silt loam, very cobbly loam to extremely stony clay. The effective rooting depth is 6 to 20 inches.

Characteristic Soils Are:
Raton, and Firo

Associated sites

R048AY001NM	**Subalpine Grassland** This site takes in mountain parks and other open grasslands generally within the spruce-fir zone. In some places it is interspersed with aspen groves. This site is located near timberline extending down to the ponderosa pine zone. Topography is mostly rolling to moderate slopes, but some areas are steep. Slopes are between 2 to 20 percent, but can range up to 40 percent. Elevation ranges from 9,000 feet to near timberline, which is approximately 11,400 feet above sea level. The soils are well drained, deep to very deep. The surface texture is loam, cobbly loam or gravelly loam. There may be large numbers of rock fragments throughout the profile as this soil has multiple soil family particle sizes correlated to it. The soils have moderate to moderately slow permeability. Runoff is moderate. Available water-holding capacity is low to medium. The effective rooting depth is 20 inches or more. On the soil Hillery which is correlated to this site, it occurs on lava flows, mesas and plains. Hillery is also above 40 inches of precipitation which is higher than the concept of this site. Surface soil textures are silt loam, and stony loam.

R048AY002NM	**Mountain Grassland** This site is found on the north and northeast-facing slopes at lower elevations and can be found on all exposures at the higher elevations. The site is located on open benchlands, outwash fans or exposed ridges between parks and valleys and higher mountain slopes. High mountain rims and mountain valleys are included in this site. The Mountain Grassland often occurs on benches or depressed areas within the steeper surrounding slopes of the ponderosa pine. The slopes ranges from 0 to 15 percent. Elevation ranges from 7,000 to 9,000 feet above sea level. These soils are well drained, deep to very deep. The surface layer is loam, silt loam or sandy loam. Gravel or stones are often present on the soil surface and throughout the profile but is not skeletal. These soils have a moderate permeability. Available water-holding capacity is moderate to high. Effective rooting depth is 40 inches to more than 60 inches.
R048AY003NM	**Mountain Valley** This site is in mountain valleys in the ponderosa pine zone. It has gentle to moderate slopes and receives occasional light overflow from the stream course or adjacent side slopes. The alluvial slopes immediately adjacent to the stream are also included in this site. Slopes are 0-5%. Along valley bottoms where drainage is poor, it may blend with the Mountain Meadow ecological site. This site differs from the Mountain Meadow ecological site in the lack of high-water table. Elevation ranges from 7,000 to 9,000 feet above sea level. Soils on this site are well drained and deep to very deep. The surface layer is loam, sandy loam or fine sandy loam with subsoil of loam, clay loam, or sandy clay loam. These soils have moderate to moderately high permeability. Runoff is medium. Available water-holding capacity is high. Effective rooting depth is 20 inches to more than 60 inches. Severe gullying can carry off most of the water, and a loss of topsoil greatly reduces water intake. Gullies that carry off extra water will drastically alter the moisture-plant relationship in many areas.
R048AY004NM	**Mountain Loam** This site is on steep to moderately steep slopes on benches within the steeper slopes of the surrounding ponderosa pine tree zone. The slope is to the southwest; south and southeast, making the site directly exposed to the dry south and southwest winds and more intensive heat from the sun. Slopes vary from 5 to 70 percent. Elevation ranges from 6,900 to 9,000 feet above sea level. The soils on this site are moderately deep to deep and well drained. The surface texture is stony/cobbly silt loam or cobbly loam. The subsurface is stony loam or cobbly loam. They have a moderate permeability. The available water-holding capacity is low. Effective rooting depth is from 20 to 40 inches. There is cobble or stone throughout the profile and on the surface. Air-water-plant relationship is fair.
R048AY006NM	**Mountain Meadow** The site occurs as lower lying drainageways, flood plains, swales or other depressional areas where extra moisture accumulates as a result of runoff from surrounding higher sites. A high water table is characteristic of this site particularly in the spring and a portion of the area may have open water during this season. Springs or seeps bring the water table to the subsoil or even to the surface, in which instance the site may colloquially be called a “cienaga”. Slopes vary from flat to gently sloping, not to exceed 5 percent. The exposure varies and is not significant. Elevation ranges from 7,000 to 9,500 feet above sea level. These soils consist of deep to very deep soils and poorly to very poorly drained. The surface texture ranges from a very fine sandy loam to a mucky silty clay and clay surface layers. They have an active water table, which varies from the surface to 3 feet below the surface. They are normally non-saline and have high organic content. These soils have moderate to moderately slow permeability. Available water-holding capacity is moderate. The effective rooting depth is 20 inches to more than 60 inches.

Similar sites

R048AY007NM	**Mountain Shale** This site is in mountainous terrain on mountain slopes and hillslopes. Slopes are dominantly moderately steep to steep with gradients varying from 15 to 75 percent. Topography varies from relatively uniform slopes of considerable length to short, steep, choppy terrain. Elevation ranges from 7,000 to 9,000 feet above sea level. This site consists of soils that are shallow to moderately deep and are well drained. The surface texture is very stony clay, very stony clay loam, cobbly loam, and stony silty clay loam soils. The soils are derived from shale parent material. The effective rooting depth is 5 to 40 inches. Shale and sandstone outcrops are common. The subsoil is typically compacted clay, which restricts root penetration.

R048AY008NM	**Mountain Brush** This site is located on the sides of basalt-capped mesas and escarpments of sandstone, basalt, shale and limestone. This site is formed on the upland leading away from vertical basalt escarpments and basalt-capped mesas. They are formed from a variety of materials derived from sandstone, basalt, shale and limestone. Rock outcrop is common and may occupy from 15 percent to 50 percent of the area. Slopes range from 5 to 25 percent. The exposure is mainly to the east, south and west. However, this site may occur on the drier north-facing slopes. North and east-facing slopes are generally more productive and tend to grow more woody vegetation. Elevation ranges from 7,500 to 9,000 feet above sea level. The soils on this site are shallow, well drained over sandstone, shale, basalt and limestone. Rock outcrops are common and occupy the nearly vertical basalt escarpments, ridges and benches of exposed sandstone, limestone and shale. Rubbleland occurs at the base of the basalt escarpments. The surface textures is usually clay loam and the subsoils are clay loam and clayey shale. The surface runoff is medium too rapid and the erosion hazard is severe. Effective rooting depth is from 12 to 20 inches.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Bouteloua gracilis* (2) *Pascopyrum smithii*

Physiographic features

This site is characterized by flat to moderately steep topography. It is frequently found as mesa, mountains slopes and ridges where the basalt caps are present. The site's terrain may be interrupted by extrusions of the basalt, leaving a rough or choppy appearance to the topography. The basaltic stone cover typically exists over a portion of the site where igneous extrusions occur. Boulders on the surface are common. The dominant slope range is from 3 to 30 percent, but it some site range up to 55 percent. The exposure varies but has little significance on plant production. Elevation ranges from 6,800 to 9,000 feet above sea level.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope (2) Mesa (3) Ridge
Runoff class	High to very high
Flooding frequency	None
Ponding frequency	None
Elevation	6,800–9,000 ft
Slope	3–30%
Aspect	Aspect is not a significant factor

Climatic features

Climate conditions for this site are typical of the lower elevation limits of the Rocky Mountains. Average annual precipitation ranges from 16 to 22 inches. Most of the precipitation received is in the form of rain from heavy thunderstorms during the hottest summer months. Winter and spring moisture is an important facet of this site and determines production of the cool-season species. Summer moisture received during the principal growing season of July, August and September determines the production of the principal warm-season grasses. Summer precipitation accounts for approximately 60 percent of the total annual precipitation, although at a moderately high elevation, the climatic features of this site are not too unlike sites at lower elevations in that precipitation amounts fluctuate greatly from year to year. Annual amounts commonly range from 8 to 35 inches. Spring precipitation in the latter part of March may be sufficient in some years to contribute greatly to the production of both warm and cool-season forage plants.

Air temperatures vary from a monthly mean of 29 degrees F in January to 69 degrees F in July. Daily high

temperatures average in the 80’s during the summer. Winter low temperatures fall below the freezing mark much of the time from mid-September through April. Date of the last killing frost is approximately May 15th. The first killing frost is approximately October 3rd. The dates of the last killing frost and the first killing frost vary from lower elevations to the higher elevation points.

The frost-free season ranges from 90 to 140 days, from mid-May through early October. The frost-free period is important only in the limiting of the production of the warm-season species that are present on the site.

Mountain winds are an important part of the climatic complex of this site, because of their indirect effect on soil and moisture and translocation of seed.

Table 3. Representative climatic features

Frost-free period (characteristic range)	34-40 days
Freeze-free period (characteristic range)	86 days
Precipitation total (characteristic range)	16-22 in
Frost-free period (actual range)	33-42 days
Freeze-free period (actual range)	86 days
Precipitation total (actual range)	16-22 in
Frost-free period (average)	37 days
Freeze-free period (average)	86 days
Precipitation total (average)	19 in

Climate stations used

- (1) ANGEL FIRE 1S [USC00290407], Cimarron, NM
- (2) EAGLE NEST [USC00292700], Eagle Nest, NM

Influencing water features

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

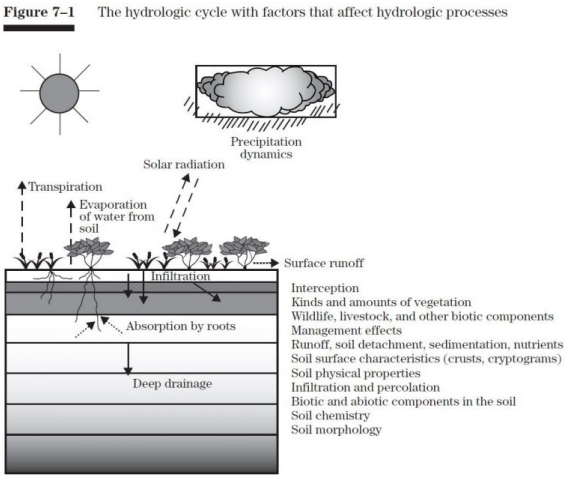

Figure 8.

Soil features

These soils are well drained, very shallow to shallow,and formed in debris from basalt and other volcanic rock or metamorphic rock. The surface texture is cobbly, very cobbly silt loam; Stony, very stony, very cobbly loam; stony, very stony silt loam; and cobbly sandy loam.

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Table 4. Representative soil features

Parent material	(1) Residuum–basalt (2) Residuum–volcanic rock (3) Alluvium–metamorphic rock (4) Colluvium–metamorphic rock (5) Residuum–metamorphic rock
Surface texture	(1) Cobbly, very cobbly silt loam (2) Stony, very stony, very cobbly loam (3) Stony, very stony silt loam (4) Cobbly sandy loam
Family particle size	(1) Clayey-skeletal (2) Loamy-skeletal
Drainage class	Well drained
Permeability class	Moderate to slow
Soil depth	6–20 in
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–40%
Available water capacity (Depth not specified)	1–2.2 in
Calcium carbonate equivalent (Depth not specified)	0%
Electrical conductivity (Depth not specified)	0–2 mmhos/cm
Sodium adsorption ratio (Depth not specified)	0–1
Soil reaction (1:1 water) (Depth not specified)	6.6–7.3
Subsurface fragment volume <=3" (Depth not specified)	5–15%
Subsurface fragment volume >3" (Depth not specified)	25–40%

Ecological dynamics

With continuous grazing through the entire season by cattle, species such as Arizona fescue, mountain muhly, little bluestem and sideoats grama will decrease in percentage of the composition. Species most likely to invade are Kentucky bluegrass, sleepygrass and annual forbs. As the ecological conditions deteriorate, these species will move in at the expense of the more desirable grasses. Species most likely to increase as the ecological conditions deteriorate are blue grama, ring muhly, threeawn, rabbitbrush, skunkbush sumac and broom snakeweed. A system of deferred grazing, which varies the season of grazing and rest during successive years in a pasture, is needed to maintain a healthy, vigorous, well-balanced plant community. Deferment during the different seasons of the year benefits different species of plants. Species such as western wheatgrass, Arizona fescue, Columbia needlegrass, Indian ricegrass and prairie junegrass will benefit from the spring and early summer rest. Species such as blue grama, mountain muhly, little bluestem and sideoats grama will benefit from a summer early fall rest.

Below is a State and Transition Model diagram to illustrate the “phases” (common plant communities), and “states” (aggregations of those plant communities) that can occur on the site. Differences between phases and states

depend primarily upon observations of a range of disturbance histories in areas where this ESD is represented. These situations include grazing gradients to water sources, fence-line contrasts, patches with differing dates and intensities of fire, herbicide treatment, etc. Reference State 1 illustrates the common plant communities that probably existed just prior to European settlement.

This ecological site may also have a mixed sagebrush mosaic component consisting of subspecies of big sagebrush (Artemisia Tridentatae), blacksage (Artemesia nova), and a number of dwarf sagebrush species. As many big sagebrush species readily hybridize with each other and several dwarf sagebrush species (Beetle and other 1960, Garcia and others 2008, Kartz and others 1988, Kornkven and others 1998, Welsh and others 1987), delineation of the exact species and boundaries may be difficult. As a whole, this mosaic of sagebrush species is extremely valuable to wildlife, providing habitat and forage for a wide variety of native fauna.

The fire response to the majority of the big and dwarf sage species is negative, with a slow post-fire recovery period (Neuenschwander,1978).

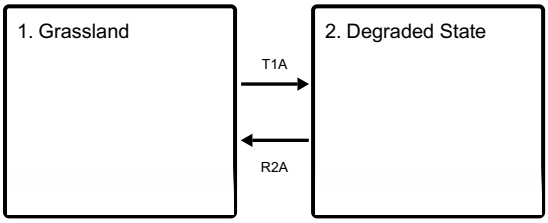
The soils characteristics associated with the sagebrush mosaic include being shallow or moderately deep to bedrock and low in calcium carbonate.

The major successional pathways within states, (“community pathways”) are indicated by arrows between phases. “Transitions” are indicated by arrows between states. The drivers of these changes are indicated in codes decipherable by referring to the legend at the bottom of the page and by reading the detailed narratives that follow the diagram.

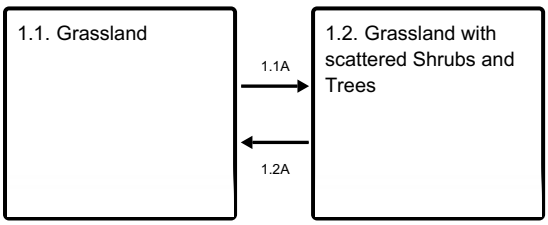
The plant communities shown in this State and Transition Model may not represent every possibility but are probably the most prevalent and recurring plant communities. As more monitoring data are collected, some phases or states may be revised, removed, and/or new ones may be added.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1
Grassland

This ecological state represents the natural range of variability on the site. The plant communities within the reference state were shaped and maintained by disturbances such as grazing, browsing, drought, rest, and fire. The removal or alteration of these processes can cause a shift to an alternative ecological state.

Community 1.1
Grassland

This site is a grassland characterized by warm-season and cool-season mid-grasses and bunch grasses, which make up approximately 80 percent of the composition of the plant community. Woody shrubs and half-shrubs are widely scattered throughout the site and make up approximately 5 percent of the composition of the plant

community. Forbs are a minor component and make up approximately 10 percent of the composition of the plant community. Tree species associated with this site which are seen widely scattered are ponderosa pine, pinyon pine and oneseed juniper. The overstory canopy is less than 5 percent. Other species that could appear include: pine dropseed, bottlebrush squirreltail, vine-mesquite, deergrass, bullgrass, big bluestem, Indiangrass, sagebrush spp., broom snakeweed and horsebrush

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	340	720	1020
Forb	40	90	120
Shrub/Vine	20	45	60
Total	**400**	**855**	**1200**

Table 6. Ground cover

Tree foliar cover	0-5%
Shrub/vine/liana foliar cover	1-5%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	10-20%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	20-30%

Figure 10. Plant community growth curve (percent production by month). NM3105, R048AY005NM Mountain Malpais HCPC. R048AY005NM Mountain Malpais HCPC Mixed cool/warm-season mid and bunch grasses grassland with minor components of shrubs and forbs. .

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

Community 1.2
Grassland with scattered Shrubs and Trees

With continuous grazing through the entire season by cattle, species such as Arizona fescue, mountain muhly, little bluestem and sideoats grama will decrease in percentage of the composition. Species most likely to invade are Kentucky bluegrass, sleepygrass and annual forbs. As the ecological conditions deteriorate, these species will move in at the expense of the more desirable grasses.

Pathway 1.1A
Community 1.1 to 1.2

Lack of fire, improper grazing of herbaceous species, and/or drought.

Pathway 1.2A
Community 1.2 to 1.1

Proper grazing, browsing of shrubs, fire and/or wet climatic cycles.

State 2
Degraded State

This state represents a shift from the reference state. The site has crossed a threshold that will require significant inputs to return to reference conditions, if possible. This has altered the hydrology and energy flow of the plant community. Species most likely to increase as the ecological conditions deteriorate are blue grama, ring muhly, threeawn, rabbitbrush, skunkbush sumac and broom snakeweed.

Transition T1A
State 1 to 2

Excessive drought periods may also favor certain species. Improper grazing will cause desirable species to decrease and less desirable species to increase. Fire exclusion may lead to an increase in woody canopy scattered across the site.

Restoration pathway R2A
State 2 to 1

Fire, wetter climatic cycles, and/or proper grazing management can help return the plant community back to grassland. Shrub management may be needed to decrease shrubs.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				162–180	
	blue grama	BOGR2	*Bouteloua gracilis*	162–180	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	162–180	–
2				108–135	
	western wheatgrass	PASM	*Pascopyrum smithii*	108–135	–
3				72–90	
	Arizona fescue	FEAR2	*Festuca arizonica*	72–90	–
4				72–90	
	mountain muhly	MUMO	*Muhlenbergia montana*	72–90	–
5				72–90	
	little bluestem	SCSC	*Schizachyrium scoparium*	72–90	–
6				72–90	
	sideoats grama	BOCU	*Bouteloua curtipendula*	72–90	–
7				27–45	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	0–45	–
	Columbia needlegrass	ACNE9	*Achnatherum nelsonii*	0–45	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–45	–
8				52–90	
	Grass, native	2GN	*Grass, native*	52–90	–
	threeawn	ARIST	*Aristida*	0–45	–
	sedge	CAREX	*Carex*	0–45	–

	mat muhly	MURI	*Muhlenbergia richardsonis*	0–45	–
	ring muhly	MUTO2	*Muhlenbergia torreyi*	0–45	–
	James' galleta	PLJA	*Pleuraphis jamesii*	0–45	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–45	–
	vine mesquite	PAOB	*Panicum obtusum*	0–15	–
	pine dropseed	BLTR	*Blepharoneuron tricholepis*	0–15	–
	squirreltail	ELEL5	*Elymus elymoides*	0–15	–
	alkali wildrye	LESI5	*Leymus simplex*	0–15	–
	big bluestem	ANGE	*Andropogon gerardii*	0–15	–
	deergrass	MURI2	*Muhlenbergia rigens*	0–15	–
	Indiangrass	SONU2	*Sorghastrum nutans*	0–15	–
Forb					
10				52–90	
	Forb, native	2FN	*Forb, native*	27–45	–
	buckwheat	ERIOG	*Eriogonum*	27–45	–
	pingue rubberweed	HYRI	*Hymenoxys richardsonii*	27–45	–
	globemallow	SPHAE	*Sphaeralcea*	27–45	–
	clover	TRIFO	*Trifolium*	27–45	–
	vetch	VICIA	*Vicia*	27–45	–
Shrub/Vine					
12				27–45	
	fourwing saltbush	ATCA2	*Atriplex canescens*	0–45	–
	alderleaf mountain mahogany	CEMO2	*Cercocarpus montanus*	0–45	–
	rubber rabbitbrush	ERNAN5	*Ericameria nauseosa ssp. nauseosa var. nauseosa*	0–45	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	0–45	–
	oak	QUERC	*Quercus*	0–45	–
	skunkbush sumac	RHTR	*Rhus trilobata*	0–45	–
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	27–45	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–15	–
	sagebrush	ARTEM	*Artemisia*	0–15	–
	horsebrush	TETRA3	*Tetradymia*	0–15	–
Tree					
13				0–27	
	oneseed juniper	JUMO	*Juniperus monosperma*	0–27	–
	twoneedle pinyon	PIED	*Pinus edulis*	0–27	–
	ponderosa pine	PIPO	*Pinus ponderosa*	0–27	–

Animal community

Grazing:
This site is best grazed during the spring, summer and fall, except where it occurs interspersed with the higher mountain ecological sites. Approximately 80 percent of the total annual yield are from species that furnish forage for grazing animals. The large variety of grasses, forbs and shrubs furnish a well-balanced feed and excellent nutrition for all grazing animals. Following a normal or mild winter, this site will green up earlier than the other mountain

ecological sites. The site is best suited for cattle. The site is better suited to a younger age of livestock due to the rocky surface.

Habitat for Wildlife:
This site provides habitats, which support a resident animal community that is characterized by pika, Colorado chipmunk, short horned lizard and prairie rattlesnake. Elk and mule deer will use these sites seasonally.

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
Raton----------D

Recreational uses

This site provides limited recreation potential for camping, hiking and picnicking as well as horseback riding and photography. The site has a numerous variety of flowers, which bloom from spring to late, fall. Hunting for deer and rabbits is fair.

Wood products

This site produces no wood products except for limited firewood for campfires.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index----------Ac/AUM
100 - 76----------2.5 – 4.0
75 – 51----------2.9 – 5.0
50 – 26----------3.7 – 9.5

Inventory data references

Data collection for this site was done in conjunction with the progressive soil surveys within the State of New Mexico. This site is found in the following soil surveys: Colfax, Taos, Mora, Santa Fe National Forest (Pecos-Las Vegas Ranger District), and San Miguel.

These site descriptions were developed as part of a Provisional ESD project using historic soil survey manuscripts, available range site descriptions.

Type locality

Location 1: Colfax County, NM
Location 2: Mora County, NM

Other references

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

Contributors

Don Sylvester
Elizabeth Wright

Approval

Kirt Walstad, 3/05/2024

Acknowledgments

Site Development and Testing Plan:

Future work, as described in a Project Plan, to validate the information in this Provisional Ecological Site Description is needed. This will include field activities to collect low, medium and high intensity sampling, soil correlations, and analysis of that data. Annual field reviews should be done by soil scientists and vegetation specialists. A final field review, peer review, quality control, and quality assurance reviews of the ESD will be needed to produce the final document. Annual reviews of the Project Plan are to be conducted by the Ecological Site Technical Team.

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	05/10/2025
Approved by	Kirt Walstad
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:

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17. **Perennial plant reproductive capability:**
