Ecological site DX035X03F003
Pinyon Juniper - Breaks/Hills
12 to 15 inches

Last updated: 5/20/2025
Accessed: 05/04/2026

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.

Ecological site concept

This ecological site is on sideslopes of basalt- capped mesas, ridges on elevated plains, and sideslopes of steep, dissected canyons. It is characterized by surface-exposed bedrock and rock outcrops. Slopes generally range from 10 to over 45%, but are sometimes steeper along bases of escarpments and dissected canyons. The soils can be shallow to deep, are well-drained, and formed in alluvium, colluvium, or residuum derived from volcanic material. Surface textures are fine to coarse sandy loams.

Table 1. Dominant plant species

Tree	(1) *Pinus edulis* (2) *Juniperus monosperma*
Shrub	(1) *Artemisia frigida*
Herbaceous	(1) *Bouteloua curtipendula* (2) *Bouteloua gracilis*

Legacy ID

F035XG003NM

Physiographic features

This ecological site is on sideslopes of basalt- capped mesas, ridges on elevated plains, and sideslopes of steep, dissected canyons. It is characterized by surface-exposed bedrock and rock outcrops. Areas can be long, narrow, and/or large, but irregular in shape. This map unit has variable exposure and distinct vegetative characteristics between cool-moist and warm-dry aspects, with variable tree densities and plant composition. Slopes generally range from 10 to over 45%, but are sometimes steeper along bases of escarpments and dissected canyons. Elevation varies within the map unit distribution.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) V-shaped valley (3) Escarpment
Elevation	1,980 − 2,500 m

Slope	10 – 50 %
Aspect	N, S

Climatic features

Representative weather station used is from Quemado, NM, Catron County, within 40 mile proximity to sites sampled. The weather station is within the climatic division NM-04, Southwestern Mountains. According to Catron County Soil Survey, this map unit is within a precipitation zone of 12-15 inch average annual precipitation. Average annual air temperature is 47 to 54 degrees (F). Due to elevation and latitude, this landscape is prone to winter and summer moisture with summer moisture exceeding winter. Summer precip is typically derived from convective showers with winter derived from snow and rain mixed storm events. Frost free days are based on >/=32.5 degrees (F); freeze free days based on >/= 30 degrees (F).

Table 3 Representative climatic features

Frost-free period (average)	130 days
Freeze-free period (average)	210 days
Precipitation total (average)	380 mm

Influencing water features

None, except downslope runoff and slope retention of snow-pack on North slopes.
This unit is not influenced by wetlands or free-flowing streams or seeps.

Soil features

Representative sites are located on Aridic Argiustolls. This site also occurs on the Majada, Guy, Faraway, and Motoqua soil series and on Ustic Torriorthents. Rock outcrops are prevalent and surface coarse fragments are common. Surface textures are fine to coarse sandy loams. The soils can be shallow to deep, well-drained and formed in alluvium, colluvium, or residuum derived from volcanic material. This site's variable slope and aspect are conducive to retaining snowpack and soil moisture and susceptible to evaporation.

This ecological site is associated with map units (MUs) 385, 471, and 487 in the Catron County soil survey.

Table 4. Representative soil features

Surface texture	(1) Very cobbly loamy sand (2) Very stony clay (3) Bouldery loamy coarse sand
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Very slow to very rapid

Soil depth	10 – 150 cm
Surface fragment cover <=3"	10 %
Surface fragment cover >3"	20 – 70 %
Calcium carbonate equivalent (0-101.6cm)	0 – 40 %
Subsurface fragment volume <=3" (Depth not specified)	10 %
Subsurface fragment volume >3" (Depth not specified)	10 – 90 %

Ecological dynamics

The Reference Plant Community is relative to the location on the landscape: influenced by aspect, slope, and accessibility to animals (ungulates), density of surface rock, and depth of soil to sustain herbaceous production for fire occurrences. There is a distinct difference in plant community structure based on aspect and its response to impacts that will influence succession. For this ESD, the distinctions are defined in terms of those landscapes that have primarily a north- or south-facing aspect.

North-facing slopes have a reference community dominated by twoneedle pinyon (hereafter called pinyon) with montane-type herbaceous species in the understory plant community such as muttongrass, prairie junegrass, Stipa spp., and Carex spp. Factors that influence plant structure would be drought and livestock and, to a lesser degree, fire due to the northerly exposure. Fire may occur but is limited in size (

State and transition model

Figure 3. State-and-Transition Model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**warm-season increasers**			67-179	
	blue grama	BOGR2	*Bouteloua gracilis*	56-140	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	11-22	–
	threeawn	ARIST	*Aristida*	6-17	–
2	**warm-season decreasers**			112-191	
	New Mexico muhly	MUPA2	*Muhlenbergia pauciflora*	84-140	–
	common wolfstail	LYPH	*Lycurus phleoides*	17-28	–
	bulb panicgrass	PABU	*Panicum bulbosum*	11-22	–
3	**cool-season increaser**			11-22	
	squirreltail	ELEL5	*Elymus elymoides*	11-22	–

4	**cool-season decreasers**			135-280	
	prairie Junegrass	KOMA	*Koeleria macrantha*	84-140	–
	muttongrass	POFE	*Poa fendleriana*	56-140	–
5	**late cool-season decreaser**			112-224	
	sideoats grama	BOCU	*Bouteloua curtipendula*	112-224	–
6	**grasslike increaser**			11-17	
	sedge	CAREX	*Carex*	11-17	–
Shrub/Vine					
7	**half-shrub increaser**			6-11	
	prairie sagewort	ARFR4	*Artemisia frigida*	6-11	–
Tree					
8	**coniferous trees**			1054-1177	
	twoneedle pinyon	PIED	*Pinus edulis*	779-865	–
	oneseed juniper	JUMO	*Juniperus monosperma*	279-310	–

Table 6. Community 1.2 plant community composition

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

Table 7. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**warm-season increasers**			45-146	
2	**warm-season decreasers**			45-112	
3	**cool-season increaser**			0-6	
4	**cool-season decreasers**			22-34	
5	**late cool-season decreaser**			78-191	
6	**grasslike increaser**			0-6	
Shrub/Vine					
7	**half-shrub increaser**			6-17	
Tree					
8	**coniferous trees**			1188-1323	

Table 8. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**warm-season increasers**			62-195	
	blue grama	BOGR2	*Bouteloua gracilis*	45-139	–
	threeawn	ARIST	*Aristida*	6-34	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	11-22	–
2	**warm-season decreasers**			62-151	
	New Mexico muhly	MUPA2	*Muhlenbergia pauciflora*	56-112	–
	common wolfstail	LYPH	*Lycurus phleoides*	6-22	–
	bulb panicgrass	PABU	*Panicum bulbosum*	0-17	–
3	**cool-season increaser**			0-11	
	squirreltail	ELEL5	*Elymus elymoides*	0-11	–
4	**cool-season decreasers**			28-56	
	prairie Junegrass	KOMA	*Koeleria macrantha*	28-45	–

	muttongrass	POFE	*Poa fendleriana*	0-11	–
5	**late cool-season decreaser**			112-252	
	sideoats grama	BOCU	*Bouteloua curtipendula*	112-252	–
6	**grasslike increaser**			0-6	
	sedge	CAREX	*Carex*	0-6	–
Shrub/Vine					
7	**half-shrub increaser**			6-22	
	prairie sagewort	ARFR4	*Artemisia frigida*	6-22	–
Tree					
8	**coniferous trees**			860-956	
	twoneedle pinyon	PIED	*Pinus edulis*	633-704	–
	oneseed juniper	JUMO	*Juniperus monosperma*	226-252	–

Animal community

These areas may be grazed by livestock. Slopes of less than 10% may be suitable for grazing although they may not have high amounts of forage production with an overstory canopy. Slopes that have been treated to remove or reduce overstory canopy may provide substantially more forage, although these stands are likely to revert to a woodland plant community through succession (grassland/juniper, juniper/grassland, juniper/pinyon, pinyon/juniper). Steeper slopes, though grazed by livestock due to the proximity of water, should not be allocated for grazing or considered in grazing capacity estimates due to susceptibility of soil erosion, density of canopy, and likelihood of increasing grazing pressure on more desirable areas if steep slopes are not fully utilized by livestock.Wildlife such as deer and elk utilize these areas for forage, escape cover, and thermal cover. It has been observed that cool season species are most utilized by wildlife during fall, winter, and early spring. Competition between livestock and wildlife can occur on these areas.

Hydrological functions

The coarse fragments on the surface and in soil profile allow for rapid runoff. Although due to steep slopes, coarse fragments contribute to soil stability and preclude some soil erosion. The soil texture (sandy loam) allows water to percolate through the soil profile. No springs or free-flowing discharges originate from this site. Runoff may contribute to downstream water table recharge. South slopes tend to be drier and retain less soil moisture, and for shorter periods of time, than north slopes. North slopes accumulate and retain snow for longer periods of time allowing for greater percolation and greater retained soil moisture for extended periods of time during fall, winter, and spring.

Recreational uses

This map unit is not conducive to any conventional recreation opportunities. It does posess scenic value, thermal cover for wildlife (wildlife viewing), and hunting opportunities. Landscape is steep and rocky and only accessible on foot or by horseback.

Wood products

No commercial wood fiber is produced from these sites. They produce very little volume for wood posts, although stays can be removed from these sites. Fuelwood value is low to moderate, but due to the steep terrain and surface rock, the land is best left undisturbed to retain soil integrity and prevent soil loss from human or livestock impact.

Other products

No other products are produced from these sites.

Other information

Grazing occurs on these sites on an occasional basis due to the proximity of drinking water, but it is advisable not to include these lands in determining base stocking capacity due to the ruggedness of the landscape which deters grazing use and the impact of grazing on shallow and highly erodible soils.

Other references

Other map units comparable to MU385 are MU487 and MU471.

MU 487- South slopes dominated by oneseed juniper with a blue grama-dominant understory containing lesser amounts of threeawns and needlegrass, slopes 30-50%, bare ground 50-60%, vegetation cover 20%. North/west slopes are dominated by pinyon with codominant oneseed juniper. Vegetation characteristics are similar to MU385, rock outcrops not as common, mostly stoney to cobbly. In some locations, such as dikes, rock outcrops may be represented as vertical bluffs. Uneven-aged stands prevalent, with old pinyon 10-30%, midaged 60-70%, young 10%, with very little seedling/saplings. Certain stands appear stable, few fire scars or mortality. Avg. DRC for pinyon is 12-16 inches old age class trees, midaged 6-10 inches. Estimated forage production is 50-150 lbs/ac.

MU 471 -- South slopes dominated by oneseed juniper, pinyon codominant, understory primarily blue grama. North slopes have slope of about 30%, rock outcrops on ridges, surface rock mostly stony to very cobbly. Surface moss found in certain locales on north slopes (not likely on south slopes). Alligator juniper and ponderosa pine may occur within the mapping unit at 5% of composition. Understory vegetation consists of blue grama as dominant with pine dropseed (10-20 lbs/ac) and mountain muhly (15-25 lbs/ac) and at times these species become very common. Also found in association with north slope vegetation are buckwheat (5-10 lbs/ac) and mountain mahogany, both are commonly hedged by livestock or wildlife. Pinyon may be stunted due to shallow soils with old oneseed juniper trees being very common.

Contributors

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Approval

Kendra Moseley, 5/20/2025

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	05/04/2026
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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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):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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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:**
