USDA Natural Resources
Conservation Service

Ecological site R035XG124NM
Hills

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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.

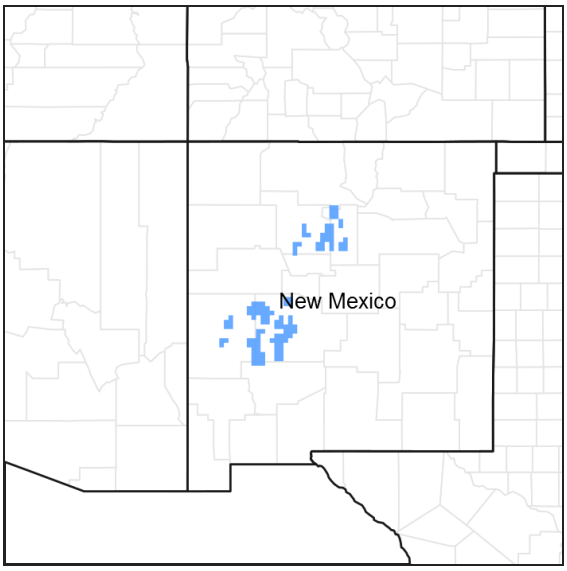

Figure 1. Mapped extent

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.

Table 1. Dominant plant species

Tree	(1) *Juniperus monosperma* (2) *Pinus edulis*
Shrub	(1) *Quercus gambelii* (2) *Cercocarpus montanus*
Herbaceous	(1) *Bouteloua gracilis* (2) *Schizachyrium scoparium*

Physiographic features

This site is characterized by rolling to steep hills and mountain footslopes. Slopes average 25 percent or more but range in extremes from 15 percent to 75 percent. Exposure or direction of slope is variable. Rock outcrops, exposed ledges, and occasional boulders are not uncommon. Elevations range from about 6000 to 7800 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain slope (3) Scarp slope
Flooding frequency	None

Ponding frequency	None
Elevation	6,000–7,800 ft
Slope	15–75%
Water table depth	72 in
Aspect	Aspect is not a significant factor

Climatic features

Average annual precipitation varies from about 10 inches to just over 16 inches. Fluctuations ranging from about 5 inches to 25 inches are not uncommon. The overall climate is characterized by cold dry winters in which winter moisture is less than summer. As much as half or more of the annual precipitation can be expected to come during the period of July through September. Thus, fall conditions are often more favorable for good growth of cool-season perennial grasses, shrubs, and forbs than are those of spring.

The average frost-free season is about 120 days and extends from approximately mid-May to early or mid-September. Average annual air temperatures are 50 degrees F or lower and summer maximums rarely exceed 100 degrees F. Winter minimums typically approach or go below zero. Monthly mean temperatures exceed 70 degrees F for the period of July and August.

Rainfall patterns generally favor warm-season perennial vegetation, while the temperature regime tends to favor cool-season vegetation. This creates a somewhat complex community of plants on a given range site which is quite susceptible to disturbance and is at or near its productive potential only when both natural warm- and cool- season dominants are present.

Table 3. Representative climatic features

Frost-free period (average)	171 days
Freeze-free period (average)	252 days
Precipitation total (average)	16 in

Influencing water features

This site is not influenced by water from wetlands or streams.

Soil features

Soils characterizing this site are typically shallow over acid igneous bedrock, although pockets of deeper soils also occur in saddles, between ledges, and lower side slopes. They may be loams, clay loams, or sandy loams, and are usually stony, gravelly or cobbly. Permeability is moderate to moderately slow, and the available water capacity is low due to shallow depth. Characteristic soils are Chimayo stony loam, Dusty gravelly loam, and Santa Fe very gravelly loam.

Table 4. Representative soil features

Surface texture	(1) Stony loam (2) Gravelly clay loam (3) Cobbly sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to excessively drained
Permeability class	Very slow to moderately rapid
Soil depth	10–72 in

Surface fragment cover <=3"	20–30%
Surface fragment cover >3"	15–25%
Available water capacity (0-40in)	1–5 in
Calcium carbonate equivalent (0-40in)	1–10%
Electrical conductivity (0-40in)	0–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0–5
Soil reaction (1:1 water) (0-40in)	6.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	10–35%
Subsurface fragment volume >3" (Depth not specified)	5–10%

Ecological dynamics

Deterioration of the potential plant community due to inadequately managed grazing is most often typified by a decline in such desirable plants as sideoats grama, black grama, cool-season grasses, mountainmahogany, and winterfat. As these plants decline, they are replaced by pinyon, juniper, broom snakeweed, and lesser-value grasses such as threeawns and galleta. Because mechanical seeding and brush control are seldom justifiable on this site, the mixed use of both browsing and grazing kinds of livestock may be the best means of maintaining a healthy balance of woody and herbaceous vegetation.

State and transition model

Ecosystem states

1. Historic Climax Plant Community

State 1 submodel, plant communities

1.1. Historic Climax Plant Community

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The potential plant community of this site has a mixed shrub-grassland aspect with scattered tree-type junipers and pinyon pines. The shrub and tree component is more visually prevalent on the cooler, north- and east-facing slopes, while low-growing shrubs and grasses prevail on south- and west- facing slopes. Dominant grasses include sideoats grama, blue grama, species of Muhlenbergia, and sometimes black grama (south-facing slopes). Cool-season species, such as New Mexico feathergrass, and needle-and-thread, are most common on north-facing

slopes. Green sprangletop, little bluestem, and bullgrass are typical aspect grasses on this site. Shrubs include skunkbush sumac, mountainmahogany and species of oak.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	281	478	675
Forb	11	19	270
Tree	50	90	100
Shrub/Vine	25	40	80
Total	**367**	**627**	**1125**

Table 6. Ground cover

Tree foliar cover	2-5%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	15-20%
Forb foliar cover	2-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	10-15%
Surface fragments >0.25" and <=3"	20-30%
Surface fragments >3"	15-25%
Bedrock	0%
Water	0%
Bare ground	15-20%

Figure 5. Plant community growth curve (percent production by month). NM0315, R035XG124NM-Hills-HCPC. Mixed warm/cool season grassland with shrubs and scattered trees..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	7	10	15	25	25	8	5	0	0

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				96–128	
	blue grama	BOGR2	*Bouteloua gracilis*	96–128	–
2				128–159	
	needle and thread	HECO26	*Hesperostipa comata*	128–159	–
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	128–159	–
	bullgrass	MUEM	*Muhlenbergia emersleyi*	128–159	–
	mountain muhly	MUMO	*Muhlenbergia montana*	128–159	–
	little bluestem	SCSC	*Schizachyrium scoparium*	128–159	–
3				0–32	
	black grama	BOER4	*Bouteloua eriopoda*	0–32	–

	black grama	BOER4	*Bouteloua eriopoda*	0–32	
4				64–96	
	threeawn	ARIST	*Aristida*	64–96	–
	pine dropseed	BLTR	*Blepharoneuron tricholepis*	64–96	–
	squirreltail	ELEL5	*Elymus elymoides*	64–96	–
	Arizona fescue	FEAR2	*Festuca arizonica*	64–96	–
	sheep fescue	FEOV	*Festuca ovina*	64–96	–
5				32–64	
	sideoats grama	BOCU	*Bouteloua curtipendula*	32–64	–
6				6–32	
	threeawn	ARIST	*Aristida*	6–32	–
	common wolfstail	LYPH	*Lycurus phleoides*	6–32	–
	spike muhly	MUWR	*Muhlenbergia wrightii*	6–32	–
	James' galleta	PLJA	*Pleuraphis jamesii*	6–32	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	6–32	–
7				6–32	
	prairie Junegrass	KOMA	*Koeleria macrantha*	6–32	–
	green sprangletop	LEDU	*Leptochloa dubia*	6–32	–
	western wheatgrass	PASM	*Pascopyrum smithii*	6–32	–
Tree					
8				32–96	
	juniper	JUNIP	*Juniperus*	32–96	–
	twoneedle pinyon	PIED	*Pinus edulis*	32–96	–
Shrub/Vine					
9				6–64	
	Fendler's ceanothus	CEFE	*Ceanothus fendleri*	6–64	–
	mountain mahogany	CERCO	*Cercocarpus*	6–64	–
	Mexican cliffrose	PUME	*Purshia mexicana*	6–64	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	6–64	–
	oak	QUERC	*Quercus*	6–64	–
	skunkbush sumac	RHTR	*Rhus trilobata*	6–64	–
10				6–19	
	Apache plume	FAPA	*Fallugia paradoxa*	6–19	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	6–19	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	6–19	–
Forb					
11				19–32	
	Forb, perennial	2FP	*Forb, perennial*	19–32	–
12				6–19	
	Forb, annual	2FA	*Forb, annual*	6–19	–

Animal community

This range site provides habitats which support a resident animal community that is characterized by mule deer, gray fox, bobcat, desert cottontail, cliff chipmunk, white- hroated woodrat, pinyon mouse, harlequin quail, red-

shafted flicker, scrub jay, pinyon jay, common raven, bridled titmouse, common bushtit, rufous-sided towhee, chipping sparrow, Eastern fence lizard, plateau whiptail, tree lizard, desert horned lizard, mountain patch-nose snake, and black-tailed rattlesnake.

Hydrological functions

Hydrology Functions:
The runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups.

Hydrologic Interpretations
Soil Series----------Hydrologic Group
Chimayo----------D

Recreational uses

This site offers good potential for hiking, horseback riding, hunting, nature observation, and photography. It has low to moderate potential for improved picnicking and camping sites, depending upon how steep the topography is. It provides natural beauty typical of the mountain foothills of the area in which it is formed.

Wood products

This site has a limited potential for wood products that is restricted almost entirely to fence posts and firewood production.

Other products

This site is well suited for grazing by multiple kinds and classes of livestock. Where slopes are steep, however, accessibility may become limited and stocking rates need to be properly adjusted. Deterioration of the potential plant community due to inadequately managed grazing is most often typified by a decline in such desirable plants as sideoats grama, black grama, cool-season grasses, mountainmahogany, and winterfat. As these plants decline, they are replaced by pinyon, juniper, broom snakeweed, and lesser-value grasses such as threeawns and galleta. Because mechanical seeding and brush control are seldom justifiable on this site, the mixed use of both browsing and grazing kinds of livestock may be the best means of maintaining a healthy balance of woody and herbaceous vegetation.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month
Similarity Index----------Ac/AUM
100 - 76----------3.6 - 4.8
75 – 51----------4.5 - 6.5
50 – 26----------6.0 - 12.5
25 – 0----------12.5 +

Contributors

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be

known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

2. **Presence of water flow patterns:**

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):

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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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:**
