

Ecological site F042CY125NM

Juniperus monosperma-Pinus edulis/Chrysothamnus nausiosus/Bouteloua gracilis-Bouteloua curtipendula

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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.

MLRA notes

Major Land Resource Area (MLRA): 042C–Central New Mexico Highlands

Major Land Resource Area (MLRA) 70C - will become 42C - is a high elevation portion of central New Mexico that is the convergence of four major physiographic provinces: Basin and Range, Southern Rocky Mountains, Great Plains, and Colorado Plateau. As such, it contains parts or characteristics of each, though tectonically, as a region, it is the easternmost extent of the Basin and Range Province and, more specifically, a structural expression of the Rio Grande Rift. It consists mostly of rangeland with some forested areas associated with numerous disconnected mountain ranges such as the Guadalupe, Sacramento, and Manzano Mountains. Other major physiographic features include the Galisteo Basin or the enclosed Estancia Basin, the structural Chupadera and Glorieta Mesas, and the piedmonts of the Buchanan and Guadalupe Mesas.

LRU notes

This site does not yet have an LRU designation.

Ecological site concept

Site occurs on steep mountain slopes ranging in elevation from 4300 to 8000 feet. Soils are loamy-skeletal ranging from shallow to deep. Plant communities are often dominated by forest cover ranging from pinyon-juniper to Douglas-fir. Soil materials are generally forming from basic parent rocks, such as limestone, which lead to accumulations of secondary carbonates in the soils and thus a more alkaline pH. Surface textures range from loams to clay loams, with subsurface textures generally more as clay loams.

Table 1. Dominant plant species

Tree	(1) <i>Juniperus monosperma</i> (2) <i>Pinus edulis</i>
Shrub	(1) <i>Chrysothamnus nauseosus</i>
Herbaceous	(1) <i>Bouteloua gracilis</i> (2) <i>Bouteloua curtipendula</i>

Physiographic features

Erramouspe soils are on mountain sideslopes. They formed in residuum and colluvial-alluvial material weathered mostly from felsite. Slopes are 20 to 60 percent. Elevation ranges from 6,600 to 7,600 feet.

The properties of this site will exist within the ranges of the following soil series, but are not necessarily characterized by their full range. Oro Grande soils are on rocky ridges and sideslopes of the mountainous foothills at elevations of 5,700 to 7,000 feet. Slopes are 3 to 55 percent. The parent materials are fine grained mixed igneous materials consisting mainly of rhyolite and andesite. The climate is

semiarid. The mean annual temperature is about 45 to 57 degrees F. The mean annual precipitation is 12 to 16 inches. The frost free season is 150 to 180 days.

Desario soils are on south-facing backslopes of low hills. They formed in slope alluvium and residuum derived from limestone of the Pennsylvanian age Madera Formation. Slopes are 5 to 45 percent. Elevation ranges from 6,400 to 8,000 feet.

Pena soils formed in alluvial deposits derived from igneous and sedimentary rocks. These soils are on bajadas, terraces, and knolls. Recent washes and arroyos have dissected the old sediments. Slopes range from 0 to 65 percent. Elevations are 4,300 to 7,800 feet.

The Penagua series consists of very deep, well drained, moderately permeable soils that formed in colluvium derived from limestone. These soils are on mountain slopes. Slope ranges from 15 to 35 percent.

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope
Slope	10 – 90 %

Climatic features

Mean annual precipitation ranges from 12 to 18 inches.

Mean annual temperature ranges from 46 to 56 degrees F.

The properties of this site will exist within the ranges of the following soil series, but are not necessarily characterized by their full range.

Erramouspe - The mean annual precipitation is 16 to 18 inches. The mean annual air temperature is 52 to 56 degrees F. The frost-free period is 120 to 160 days.

Oro Grande - The climate is semiarid. The mean annual temperature is about 45 to 57 degrees F. The mean annual precipitation is 12 to 16 inches. The frost free season is 150 to 180 days.

Desario - The mean annual precipitation is 13 to 15 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 49 to 51 degrees F. The frost-free period is 130 to 150 days.

Pena - Pena soils occur in a semiarid climate. Mean annual precipitation ranges from 12 to 17 inches with a maximum during July, August, September and October. Mean annual temperature is about 45 to 57 degrees F. The frost-free period is 100 to 180 days.

Penagua - The mean annual air temperature is 46 to 54 degrees. The mean annual precipitation is 16 to 18 inches. The precipitation falls mostly during the months of July through September. The driest months are March and April. Precipitation during the months of January, February, and March is less than 13 percent of the total. The frost-free period is 120 to 180 days. The elevation ranges from 4,490 to 8,660 feet.

Table 3 Representative climatic features

Frost-free period (actual range)	100-180 days
Freeze-free period (actual range)	
Precipitation total (actual range)	310-460 mm

Influencing water features

This is an upland site, and is not associated with wetlands or stream systems. During heavy rain or snowmelt events, it can be expected to shed water to sites lower on the landscape.

Soil features

The Erramouspe series consists of moderately deep, well drained, slowly permeable soils that formed in residuum and colluvial-alluvial material weathered from igneous rocks. Erramouspe soils are on steep and very steep mountainsides. Slopes are 20 to 60 percent. Mean annual precipitation is about 17 inches and mean annual temperature is about 54 degrees F

The Oro Grande series consists of shallow, well drained soils that formed in material weathered from rhyolite and andesite. Oro Grande soils are on rocky ridges and sideslopes of mountainous foothills. Slopes are 3 to 55 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 51 degrees F.

The Desario series consists of shallow, well drained soils that formed in slope alluvium and residuum derived from limestone. Desario soils are on south-facing backslopes of low hills. Slopes are 5 to 45 percent. Mean annual precipitation is about 14 inches and mean annual temperature is about 50 degrees F.

The Pena series consists of very deep, well drained, moderately permeable soils formed in alluvial deposits derived from igneous and sedimentary rocks. These soils are on bajadas, terraces and knolls with slopes ranging from 0 to 65 percent. Mean annual precipitation is about 14 inches and the mean annual temperature is about 51 degrees F.

The Penagua series consists of very deep, well drained, moderately permeable soils that formed in colluvium derived from limestone. These soils are on mountain slopes. Slope ranges from 15 to 35 percent. The mean annual precipitation is about 17 inches, and mean annual temperature is about 52 degrees F.

Table 4. Representative soil features

Surface texture	(1) Extremely gravelly loam (2) Stony loam (3) Gravelly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Soil depth	30 – 80 cm

Table 5. Representative soil features (actual values)

Drainage class	Not specified
Soil depth	30 – 150 cm

Ecological dynamics

Pinyon Juniper woodland forest with principal vegetation: blue grama, black grama, hairy grama, sideoats grama, bluestem spp, stipa spp., sideoats grama, wolftail, curlyleaf muhly, metcalf muhly, pinyon ricegrass, oak bush spp., algerita, pinon, alligator juniper, oneseed juniper, mountain mahogany, beargrass, and prickly pear cactus. At higher elevations, some Gambel oak, mountain muhly and Arizona fescue.

Under continuous grazing, a loss of understory species may occur leading to extensive bare ground and erosion of topsoil material and loss of organic matter. This may lead to higher densities of woody species and higher fuel loads that will burn hotter during fire periods.

State and transition model

Additional community tables

Table 6. Community 1.1 plant community composition

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

Christine Bishop

Approval

Kendra Moseley, 10/21/2024

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	09/14/2026
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:
