

Ecological site F039XB102NM
Juniperus monosperma-Pinus edulis/Bouteloua gracilis

Accessed: 05/11/2025

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.

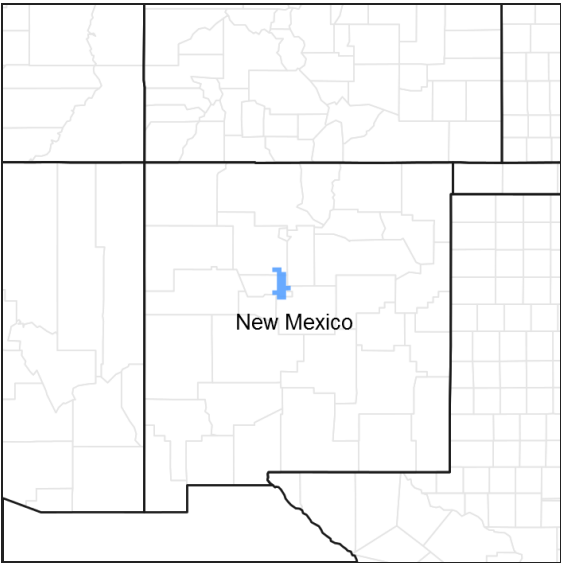


Figure 1. Mapped extent

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) <i>Juniperus monosperma</i> (2) <i>Pinus edulis</i>
Shrub	Not specified
Herbaceous	(1) <i>Bouteloua gracilis</i>

Physiographic features

The Ponderosa pine community is found from 6,500 – 8,000 feet. The Ponderosa forest occupies mountain slopes, especially south and west facing slopes at higher elevations.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
Elevation	6,500–8,000 ft
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation ranges from 16 to 30 inches. Precipitation increases with elevation. Variations of 5 inches, more or less, are common. Nearly two-thirds of the precipitation falls in the form of high-intensity, short-duration thunderstorms from March to October. Winter precipitation is mainly in the form of snowfalls of 6 to 10 inches.

Mild summers and moderately cold winters characterize the temperature regime. Large seasonal and diurnal temperature changes occur. The average annual temperature is about 45 degrees F with extremes of -26 degrees F in winter to 100 degrees F in summer.

The average frost-free season is 80 to 145 days. The last killing frost is in early May to early June and the first killing frost is in early September to early October.

Temperature and precipitation favor cool-season, perennial plant growth. However, the temperatures are warm enough at the lower elevations to allow warm-season species to occupy an important part of this plant community. Because of the water table in this site, production, density, and types of plants differ greatly from adjoining sites.

Climate data was obtained from <http://www.wrcc.sage.dri.edu/summary/climsmnm.html> using 50% probability for freeze-free and frost-free seasons using 28.5 degrees F and 32.5 degrees F, respectively.

Table 3. Representative climatic features

Frost-free period (average)	147 days
Freeze-free period (average)	175 days
Precipitation total (average)	30 in

Influencing water features

Soil features

These soils are shallow to deep, well-drained, moderate to slowly permeable soils formed in medium to fine textured material. These soils are on mountain slopes and cuestas, and over granite and limestone. Slopes range from 10 to 40 percent.

Table 4. Representative soil features

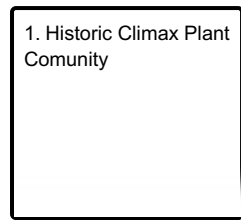
Surface texture	(1) Very cobbly loam (2) Stony fine sandy loam (3) Cobbly
Family particle size	(1) Loamy
Drainage class	Well drained to excessively drained
Permeability class	Rapid to very rapid
Soil depth	12–60 in
Surface fragment cover <=3"	5–10%
Surface fragment cover >3"	5–40%

Ecological dynamics

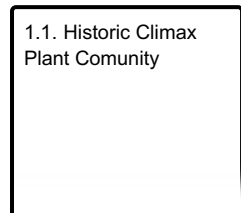
The Ponderosa pine forest is the lowest elevation forest of the true forest zone. The elevation of this forest ranges from 6,500 – 8,000 feet. The forest is found in areas of moderate moisture but also occupies areas of relatively dry and sandy soil. The forest may consist of widely scattered individuals, or grow in parklike stands on dry hillsides and plateaus. On cooler northern slopes the stands are thicker and may include Douglas fir. At lower elevations, juniper trees may be present.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1 Historic Climax Plant Community

Community 1.1 Historic Climax Plant Community

The potential plant community on this site is a mixed stand of pinon pine, oneseed juniper, and Rocky Mountain juniper. Shrubs, perennial grasses and forbs are common in the understory. Canopy cover in mature stands range from 50-70%. Mature tree heights average 25 feet. The aspect is coniferous woodland. The lower limit of these woodlands is controlled by drought and soil moisture regimes. These woodlands occur below the ponderosa pine belts and on steep, northern aspects at lower elevations. Natural fire-free intervals averages two to six centuries. Natural fires are crowning, intense, and cover large areas. Other fires tend to be single-tree lightening caused fires. That do not spread due to lack of herbaceous understory. In wetter soil areas on steep north exposures, quaking aspen is successional to higher numbers of long pinon. After stand replacing fires, shrubs (mountain mahogany, oak, and New Mexico locust) can form into dense growth. The shrubby aspect yields in time to pine and juniper. Major sources of natural disturbance are changes in climate, grazing, and infestation of insects. Bark beetles beetles of the genus ** attach pines and during drought infestations can kill healthy trees. These outbreaks and climate are bigger ecological drivers than fire in these systems. Exclusion of wildfires favor pine and Rocky mountain juniperwhich are more shade tolerant to than one seed juniper tolerant Fire exclusion allows stands to thicken, making it easier for mistletoe to spread and suppressed growth weakens trees increasing attack by pine beetles. Allowing fires to burn naturally in open stands takes out damaged trees and favors one or two storied forests less conducive to spruce budworm outbreaks. Tree stocking in these woodlands range from ***. Canopy cover in mature stands averages ***. Periodic severe drought can occur in this region. Stand replacing fires usually follow periods of severe drought.

Additional community tables

Animal community

Ponderosa forest species include elk, deer, black bear, mountain lion and squirrels.

Hydrological functions

A healthy Ponderosa forest will have a duff layer that will lessen the impact of heavy rain and aid in the infiltration of runoff.

Recreational uses

1. Camping
2. Hiking

3. Hunting

Wood products

Saw logs, vigas, etc. This is the most important economic forest zone in the southwest.

Type locality

Location 1: Lincoln County, NM

Contributors

Christine Bishop

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:**
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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:**
