SOUTHERN ROCKY MOUNTAIN PINYON-JUNIPER WOODLAND

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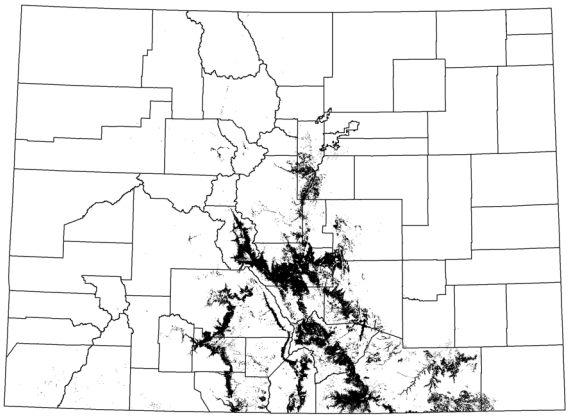

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JUNIPERUS MONOSPERMA WOODLAND ALLIANCE
- *Juniperus monosperma / Artemisia bigelovii* Woodland
- *Juniperus monosperma / Bouteloua curtipendula* Woodland
- *Juniperus monosperma / Bouteloua eriopoda* Woodland
- *Juniperus monosperma / Bouteloua gracilis* Woodland
- *Juniperus monosperma / Bouteloua hirsuta* Woodland
- *Juniperus monosperma / Cercocarpus montanus - Ribes cereum* Woodland
- *Juniperus monosperma / Hesperostipa neomexicana* Woodland

PINUS EDULIS - (JUNIPERUS SPP.) WOODLAND ALLIANCE
- *Pinus edulis - (Juniperus monosperma) / Bouteloua gracilis* Woodland
- *Pinus edulis - (Juniperus monosperma, Juniperus osteosperma) / Hesperostipa comata* Woodland
- *Pinus edulis - Juniperus* spp. */ Artemisia tridentata* Woodland
- *Pinus edulis - Juniperus* spp. */ Cercocarpus montanus* Woodland
- *Pinus edulis - Juniperus* spp. */ Quercus gambelii* Woodland
- *Pinus edulis / Achnatherum scribneri* Woodland
- *Pinus edulis / Leymus ambiguus* Woodland
- *Pinus edulis / Poa fendleriana* Woodland
- *Pinus edulis / Pseudoroegneria spicata* Woodland
- *Pinus edulis / Purshia tridentata* Woodland
- *Pinus edulis / Quercus* X *pauciloba* Woodland

Overview: This southern Rocky Mountain ecological system occurs on dry mountains and foothills in southern Colorado, in mountains and plateaus of northern New Mexico and Arizona, and extends out onto breaks in the Great Plains. In Colorado, the southern Rocky Mountain pinyon-juniper woodlands are found in the south central part of the state, around the San Luis Valley, southern mountain front east to Mesa de Maya, and north to the Arkansas River Valley and Palmer Divide. In the canyons and tablelands to the east, *Pinus edulis* is absent, and this system is replaced by the Southern Rocky Mountain Juniper Woodland and Savanna system.

Characteristic species: *Pinus edulis* and/or *Juniperus monosperma* dominate the tree canopy. *Juniperus scopulorum* may codominate or replace *Juniperus monosperma* at higher elevations. Understory layers are variable and may be dominated by shrubs, graminoids, or be absent. Associated species include *Artemisia tridentata, Cercocarpus montanus, Quercus gambelii, Achnatherum scribneri, Bouteloua gracilis, Festuca arizonica*, and *Pleuraphis jamesii*.

Environment: These woodlands occur on warm, dry sites on mountain slopes, mesas, plateaus, and ridges. Severe climatic events occurring during the growing season, such as frosts and drought, are thought to limit the distribution of pinyon-juniper woodlands to relatively narrow altitudinal belts on mountainsides. Soils supporting this system vary in texture ranging from stony, cobbly, gravelly sandy loams to clay loam or clay.

Dynamics: Pinyon-juniper woodlands are influenced by climate, grazing, fires, tree harvest, and insect-pathogen outbreaks (West 1999; Eager 1999). From the late 1800s to the present, distribution and

density of pinyon and juniper and accompanying native understory has been significantly altered (Stevens 1999). The effect of a fire on a stand is largely dependent on the tree height and density, fine fuel load on the ground, weather conditions, and season (Wright et al. 1979, Dwyer and Pieper 1967). Large trees generally survive unless the fire gets into the crown due to heavy fuel loads in the understory. In this system fire acts to open stands, increase diversity and productivity in understory species, and create a mosaic of stands of different sizes and ages across the landscape while maintaining the boundary between woodlands and adjacent shrubs or grasslands (Bradley et al. 1992). Altered fire regimes, overgrazing, and tree cutting can all affect stand quality and fire behavior. These factors can also disturb cryptogamic soils and lead to increased soil erosion and habitat/species loss.

Variation: Stands vary considerably in appearance and composition, both altitudinally and geographically. Juniper tends to be more abundant at the lower elevations, pinyon tends to be more abundant at the higher elevations, and the two species share dominance within a broad middle-elevation zone (Woodin and Lindsey 1954, Heil et al. 1993).

Site conditions influence the stand density. Sites with fewer trees typically have relatively deep soils and support a dense herbaceous level; those with more trees have shallow, rocky soils and often occur on steeper slopes. Stands may range from even aged to un-even aged stands. Some stands may have closed canopies with little or no understory, but many stands are open with widely scattered trees with a wide variety of understory vegetation (Rondeau 2001).

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West, N. E. 1999. Distribution, composition, and classification of current Juniper-Pinyon woodlands and savannas across western North America. Pages 20-23 in S. B. Monsen and R. Stevens, eds., Proceedings: ecology and management of pinyon-juniper communities within the Interior West. U.S. Dept. Agric., Forest Service, Rocky Mountain Research Station, Proc. RMRS-P-9 Ogden, UT . 411.

Wright, H. A., L. F. Neuenschwander, and C. M. Britton. 1979. The role and use of fire in sagebrush-grass and pinyon-juniper plant communities:A state-of-the-art review. Gen. Tech. Rep. INT-58, USDA, Forest Serv., Ogden, Utah. 49 pp.

Woodin, H. E., and A. A. Lindsey. 1954. Juniper-pinyon east of the Continental Divide, as analyzed by the pine-strip method. Ecology 35:473-489.

Rank:	A	B	C	D
① SIZE				
Acres	>90,000	50,000-90,000	30,000-50,000	< 30,000
② CONDITION				
Community structure	Tree density is <30 per ha on favorable sites, and up to 200 trees per ha on rocky, less favorable sites. Native dominated herbaceous cover between trees is heavy enough to carry regular fires. This is less important on steep, rocky sites.	Tree density is <40 ha on favorable sites, but not more than 600 trees per ha on rocky, less favorable sites. Community dominated by natives, herbaceous undergrowth is present but may be declining.	Tree density is >40 trees per ha on favorable sites, >600 per ha on rocky, less favorable sites. Community dominated by native species; herbaceous undergrowth is sparse and not sufficient to carry fire.	Tree density is very high (>800 ha) on both favorable and poor sites.
Non-native spp. (annual grasses, e.g. *Bromus tectorum*)	Absent or incidental.	May be present in disturbed areas only.	Can be abundant in both small and large patches.	Present and abundant.
Native increaser spp.	< 5% cover.	May be present and even dominant in spots, but not throughout the occurrence.		
Disturbance (e.g. ranch activities and buildings; energy development; off-road vehicle use)	No surficial disturbance is evident, the stand has never been "chained" and re-seeded. Some disturbance may be evident in small, isolated areas (e.g. mines or ranch activities and buildings; minor off-road vehicle use--<1%). Few to no roads.	No surficial disturbance is evident, the stand has never been "chained" and re-seeded. If some disturbance is evident it is limited to less than 20% of the occurrence area. There are no to only a few roads found within the occurrence.	Surficial disturbances occur on more than 20% of the area. Up to 50% of the stand may have been "chained" and re-seeded. There are more than a few roads found within the occurrence.	Surficial disturbances occur on more than 50% of the area (e.g. mines or ranch activities and buildings; off-road vehicle use). Up to 50% of the stand may have been "chained" and re-seeded.
Ground cover	Microbiotic crusts are intact. Natural microrelief is undisturbed. Soil erosion is not accelerated by anthropogenic activities. Accelerated soil erosion had not occurred, or if in the past, the herbaceous cover has increased sufficiently to check this problem.	Microbiotic crusts are intact in at least 80% of the occurrence. Soil erosion may be accelerated in small patches, or lightly so throughout the occurrence. Soil erosion can be easily reversed by relatively simple, straightforward, and inexpensive changes in management.	Microbiotic crusts are removed from more than 25% of the area, or are in various stages of degradation throughout the occurrence. Soil erosion and gullying may be observed in patches (up to 30%) within the stand.	Microbiotic crusts are >75% removed, occurring only in small pockets naturally protected from livestock and off-road vehicle use. Soil erosion may be severe in places.
③ LANDSCAPE CONTEXT				
Connectivity	Highly connected.	Moderately connected.	Moderately fragmented.	Highly fragmented.
Surrounding land	Area around the occurrence is largely intact natural vegetation, with species interactions and natural processes occurring across communities.	Area around the occurrence is moderately intact natural vegetation, with species interactions and natural processes occurring across many communities; landscape includes partially disturbed natural or semi-natural communities, some of it not high quality due to excessive grazing or recent logging.	Area around the occurrence is largely a combination of cultural and natural vegetation, with barriers between species interactions and natural processes across natural communities; occurrence is surrounded by a mix of intensive agriculture and adjacent forest lots (total area no smaller than ten times the minimum "C"-rated size).	Area around the occurrence is entirely, or almost entirely, surrounded by agricultural or urban land use; occurrence is at best buffered on one side by natural communities.