11190

Southern Rocky Mountain Juniper Woodland and Savanna

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Steppe/Savanna

Map Zones

24, 25

Geographic Range

Found throughout the region. This type is usually the lowest elevation tree-dominated type in the area, and is found on lower mountain slopes, mesas and on adjacent plains. Found along the east and south slopes of the southern Rockies and mountains in central Arizona and New Mexico.

Biophysical Site Description

This ecological system occupies the lower and warmest elevations. It is best represented just below the lower elevational range of ponderosa pine and often intermingles with grasslands and shrublands. This system is best described as a savanna that has widely spaced, mature (>150yrs) juniper trees and occasionally *Pinus edulis.*

Vegetation Description

*Juniperus monosperma* and *Juniperus scopulorum* (at higher elevations) are the dominant tall shrubs or short trees. *Pinus edulis* may be present. Graminoid species are similar to those found in Western Great Plains Shortgrass Prairie (CES303.672), with *Bouteloua gracilis* and *Pleuraphis jamesii* being most common. In addition, succulents such as species of Yucca and Opuntia are typically present.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PIED | *Pinus edulis* | Twoneedle pinyon |
| JUMO | *Juniperus monosperma* | Oneseed juniper |
| JUSC2 | *Juniperus scopulorum* | Rocky mountain juniper |
| BOGR2 | *Bouteloua gracilis* | Blue grama |
| PLJA | *Pleuraphis jamesii* | James' galleta |
| YUCCA | *Yucca* | Yucca |

Species names are from the NRCS PLANTS database. Check species codes at http://plants.usda.gov.

Disturbance Description

Disturbance by fire in this type is primarily either stand replacement or single-tree. There is little fire importation from adjacent types. Some areas have extensive mortality since 2002 due to the drought-induced Ips beetle outbreak. Return interval for fire could be extended by ungulate grazing. Concentrations of ungulates could increase the percent of the landscape dominated by trees and some shrubs compared with reference conditions. Fire return intervals are now in the range of 60yrs+. Episodic disturbance caused by insect infestation (grasshoppers, range caterpillars and Mormon crickets). Past fire regimes in southwestern pinyon-juniper woodlands were mixed, having both surface and crown fires, and are a reflection of variable intensity and frequency depending on site productivity. Productive sites could sustain patchy fires at intervals of 10-50yrs, and could have attained densities sufficient to carry crown fires at intervals of 200-300yrs. In open stands, where grass cover was continuous, fire intervals might have been 10yrs or less, and probably maintained grasslands and savannas (Gottfried 1999).

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 501 | 5 |  |  |
| Moderate (Mixed) | 217 | 12 |  |  |
| Low (Surface) | 32 | 83 |  |  |
| All Fires | 26 | 100 |  |  |

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is the central tendency modeled. Percent of all fires is the percent of all fires modeled in that severity class. Minimum and Maximum FIs show the relative range of fire intervals as estimated by model contributors, if known.

Scale Description

The most common disturbance in this type is very small-scale, either single-tree or small groups. If the conditions are just right, then it will burn whole stands up to 1,000s of acres.

Adjacency or Identification Concerns

Higher elevation sites of this type borders the juniper steppe type. It is replaced upward by ponderosa pine and/or Gambel oak / Cercocarpus shrubland, and desert scrub on the lower end.

Issues or Problems

Note that open and closed classes are reversed from the standard in this model (i.e., B/E are open and C/D are closed canopy).

Native Uncharacteristic Conditions

Comments

Succession Classes

**Mapping Rules**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Upper Layer Lifeform** | **Height (m)** | **Canopy Cover (%)** | | | | | | | | | |
| **0-10** | **11-20** | **21-30** | **31-40** | **41 - 50** | **51-60** | **61-70** | **71-80** | **81-90** | **91-100** |
| Herb | 0-0.5 | A | A | A | A | A | A | A | A | A | A |
| Herb | 0.5-1.0 | A | A | A | A | A | A | A | A | A | A |
| Herb | >1.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0-0.5 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0.5-1.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 1.0-3.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | >3.0 | A | A | A | A | A | A | A | A | A | A |
| Tree | 0-5 | A | A | A | A | A | A | A | A | A | A |
| Tree | 5-10 | B | B | B | B | C | C | C | C | C | C |
| Tree | 10-25 | E | E | E | E | D | D | D | D | D | D |
| Tree | 25-50 | E | E | E | E | D | D | D | D | D | D |
| Tree | >50 | E | E | E | E | D | D | D | D | D | D |

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leafform distinction where a qualifier is added to the class letter: Brdl (broadleaf), Con (conifer), or Mix (mixed conifer and broadleaf). UN refers to uncharacteristic native or a combination of height and cover that would not be expected under the reference condition. NP refers to not possible or a combination of height and cover which is not physiologically possible for the species in the BpS.

**Description**

Class A 8 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIED | Pinus edulis | Twoneedle pinyon | All |
| JUMO | Juniperus monosperma | Oneseed juniper | All |
| JUSC2 | Juniperus scopulorum | Rocky mountain juniper | All |
| BOGR2 | Bouteloua gracilis | Blue grama | Lower |

Description

Grass/forb/shrub/seedling, usually post-fire.

*Maximum Tree Size Class*  
Sapling >4.5ft; <5"DBH

Class B 2 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIED | Pinus edulis | Twoneedle pinyon | Upper |
| JUMO | Juniperus monosperma | Oneseed juniper | Upper |
| JUSC2 | Juniperus scopulorum | Rocky mountain juniper | Upper |
| BOGR2 | Bouteloua gracilis | Blue grama | Lower |

Description

Mid-development, open pinyon-juniper stand with mixed shrub/herbaceous community in understory

*Maximum Tree Size Class*  
Medium 9-21"DBH

Class C 8 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIED | Pinus edulis | Twoneedle pinyon | Upper |
| JUMO | Juniperus monosperma | Oneseed juniper | Upper |
| JUSC2 | Juniperus scopulorum | Rocky mountain juniper | Upper |
| BOGR2 | Bouteloua gracilis | Blue grama | Lower |

Description

Mid-development, dense pinyon-juniper woodland; understory being lost.

*Maximum Tree Size Class*  
Medium 9-21"DBH

Class D 6 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIED | Pinus edulis | Twoneedle pinyon | Upper |
| JUMO | Juniperus monosperma | Oneseed juniper | Upper |
| JUSC2 | Juniperus scopulorum | Rocky mountain juniper | Upper |
| BOGR2 | Bouteloua gracilis | Blue grama | Lower |

Description

Dense, old-growth stands with multiple layers. Late-development, closed pinyon-juniper forest. May have all-aged, multi-storied structure. Moderate mortality within stand. Occasional shrubs with few grasses and forbs and often much rock.

*Maximum Tree Size Class*  
Large 21-33"DBH

Class E 76 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIED | Pinus edulis | Twoneedle pinyon | Upper |
| JUMO | Juniperus monosperma | Oneseed juniper | Upper |
| JUSC2 | Juniperus scopulorum | Rocky mountain juniper | Upper |
| BOGR2 | Bouteloua gracilis | Blue grama | Lower |

Description

Late-development, open juniper-pinyon stand with savannah-like appearance; mixed grass/shrub/herbaceous community.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:OPN | 69 |
| Mid1:CLS | 50 | Late1:CLS | 149 |
| Mid1:OPN | 70 | Late1:OPN | 239 |
| Late1:CLS | 195 | Late1:CLS | 259 |
| Late1:OPN | 240 | Late1:OPN | 999 |

Probabilistic Transitions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Disturbance Type** | **Disturbance occurs In** | **Moves vegetation to** | **Disturbance Probability** | **Return Interval (yrs)** | **Reset Age to New Class Start Age After Disturbance?** | **Years Since Last Disturbance** |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.0025 | 400 | Yes | 0 |
| Competition or Maintenance | Early1:ALL | Early1:ALL | 0.01 | 100 | No | 0 |
| Alternative Succession | Early1:ALL | Mid1:CLS | 0.015 | 67 | Yes | 0 |
| Alternative Succession | Mid1:OPN | Late1:CLS | 0.002 | 500 | Yes | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.002 | 500 | Yes | 0 |
| Mixed Fire | Mid1:OPN | Mid1:OPN | 0.003 | 333 | No | 0 |
| Competition or Maintenance | Mid1:OPN | Mid1:OPN | 0.007 | 143 | No | 0 |
| Surface Fire | Mid1:OPN | Late1:OPN | 0.04 | 25 | Yes | 0 |
| Surface Fire | Mid1:CLS | Mid1:CLS | 0.001 | 1000 | No | 0 |
| Mixed Fire | Mid1:CLS | Mid1:CLS | 0.001 | 1000 | No | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.002 | 500 | Yes | 0 |
| Mixed Fire | Mid1:CLS | Mid1:OPN | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Late1:OPN | Early1:ALL | 0.002 | 500 | Yes | 0 |
| Mixed Fire | Late1:OPN | Late1:OPN | 0.005 | 200 | No | 0 |
| Insects or Disease | Late1:OPN | Late1:OPN | 0.005 | 200 | No | 0 |
| Surface Fire | Late1:OPN | Late1:OPN | 0.04 | 25 | No | 0 |
| Surface Fire | Late1:CLS | Late1:CLS | 0.0005 | 2000 | No | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.0015 | 667 | Yes | 0 |
| Mixed Fire | Late1:CLS | Late1:OPN | 0.005 | 200 | Yes | 0 |
| Insects or Disease | Late1:CLS | Late1:OPN | 0.005 | 200 | Yes | 0 |

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