11150

Inter-Mountain Basins Juniper Savanna

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Steppe/Savanna

Map Zones

28

Geographic Range

This widespread ecological system occupies dry foothills and sandsheets of western CO, northwestern NM, northern AZ, UT, west into the Great Basin of NV and southern ID.

Biophysical Site Description

This ecological system is typically found at lower elevations ranging from 1,500-2,300m. Occurrences are found on lower mountain slopes, hills, plateaus, basins and flats often where juniper is expanding into semi-desert grasslands and steppe.

Vegetation Description

The vegetation is typically open savanna, although there may be inclusions of more dense juniper woodlands. This savanna is typically dominated by *Juniperus osteosperma* trees with high cover of perennial bunch grasses and forbs, with *Bouteloua gracilis*, *Hesperostipa comata*, and *Pleuraphis jamesii* being most common. In the southern Colorado Plateau, *Juniperus monosperma* or juniper hybrids may dominate the tree layer. Pinyon trees are typically not present because sites are outside the ecological or geographic range of *Pinus edulis* and *Pinus monophylla*.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| JUOS | *Juniperus osteosperma* | Utah juniper |
| JUOC | *Juniperus occidentalis* | Western juniper |
| BOGR2 | *Bouteloua gracilis* | Blue grama |

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

Disturbance Description

Uncertainty exists about the fire frequencies of this ecological system. Fire occurrence was primarily determined by fire occurrence in the surrounding matrix vegetation. Lightning-ignited fires were common but typically did not affect more than a few individual trees. Replacement fires were uncommon to rare (average FRI of 100-500yrs) and occurred primarily during extreme fire behavior conditions. Mixed severity fire (average FRI of 100-500yrs) was characterized as a mosaic of replacement and surface fires distributed through the patch at a fine scale (<0.1ac). Surface fires could occur in stands where understory grass (FEID) cover is high and provides adequate fuel. Surface fire were primarily responsible for producing fire scars on juniper or pinyon trees (average FRI of 100yrs).

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 340 | 33 | 100 | 1000 |
| Moderate (Mixed) | 437 | 26 | 100 | 1000 |
| Low (Surface) | 278 | 41 |  |  |
| All Fires | 113 | 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

Juniper steppe was usually distributed across the landscape in patches that range from 10s-100s of acres in size. In areas with very broken topography and/or mesa landforms this type may have occurred in patches of several hundred acres. In UT and NV pinyon and juniper landscape patches tended to be 10-100s of acres in size.

Adjacency or Identification Concerns

This system is generally found at lower elevations and more xeric sites than Great Basin Pinyon-Juniper Woodland (CES304.773) or Colorado Plateau Pinyon-Juniper Woodland (CES304.767).

Fire regime primarily determined by adjacent vegetation and spread from the adjacent types into this community.

In modern days, surrounding matrix vegetation has changed to young-mid aged woodlands that burn more intensely than the former sagebrush matrix. Many lay-people confuse these younger pinyon and juniper woodlands with true woodlands dependent on naturally fire-protected features.

Issues or Problems

Native Uncharacteristic Conditions

Canopy cover of trees >40% can be considered uncharacteristic in this savanna BpS.

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 | B | B | B | B | B | B | B | B |
| Herb | 0.5-1.0 | A | A | B | B | B | B | B | B | B | B |
| Herb | >1.0 | A | A | B | B | B | B | B | B | B | B |
| Shrub | 0-0.5 | B | C | C | C | UN | UN | UN | UN | UN | UN |
| Shrub | 0.5-1.0 | B | C | C | C | UN | UN | UN | UN | UN | UN |
| Shrub | 1.0-3.0 | B | C | C | C | UN | UN | UN | UN | UN | UN |
| Shrub | >3.0 | B | C | C | C | UN | UN | UN | UN | UN | UN |
| Tree | 0-5 | C | C | C | C | UN | UN | UN | UN | UN | UN |
| Tree | 5-10 | C | D | E | E | UN | UN | UN | UN | UN | UN |
| Tree | 10-25 | C | D | E | E | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | C | D | E | E | UN | UN | UN | UN | UN | UN |
| Tree | >50 | C | D | E | E | UN | UN | UN | UN | UN | UN |

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 3 Early Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| BOGR2 | Bouteloua gracilis | Blue grama | Upper |
| HECO26 | Hesperostipa comata | Needle and thread | Upper |
| PLEUR12 | Pleuraphis | Galleta grass | Upper |

Description

Initial post-fire community dominated by annual forbs. Later stages of this class contain greater amounts of perennial grasses and forbs.

*Maximum Tree Size Class*  
None

Class B 5 Early Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| BOGR2 | Bouteloua gracilis | Blue grama | Upper |
| HECO26 | Hesperostipa comata | Needle and thread | Upper |
| ARTRV | Artemisia tridentata ssp. vaseyana | Mountain big sagebrush | Upper |

Description

Dominated by perennial forbs and grasses. Total cover remains low due to shallow unproductive soil.

*Maximum Tree Size Class*  
None

Class C 13 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ARTRV | Artemisia tridentata ssp. vaseyana | Mountain big sagebrush | Upper |
| BOGR2 | Bouteloua gracilis | Blue grama | Middle |
| JUOC | Juniperus occidentalis | Western juniper | Mid-Upper |
| JUOS | Juniperus osteosperma | Utah juniper | Mid-Upper |

Description

Shrub dominated community with young juniper seedlings emerging and becoming established.

*Maximum Tree Size Class*  
Seedling <4.5ft

Class D 36 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| JUOC | Juniperus occidentalis | Western juniper | Upper |
| BOGR2 | Bouteloua gracilis | Blue grama | Lower |
| ARTRV | Artemisia tridentata ssp. vaseyana | Mountain big sagebrush | Middle |
| JUOS | Juniperus osteosperma | Utah juniper | Upper |

Description

Community dominated by young juniper and pine of mixed age structure. Juniper and pinyon becoming competitive on site and beginning to affect understory composition.

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

Class E 43 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| JUOC | Juniperus occidentalis | Western juniper | Upper |
| BOGR2 | Bouteloua gracilis | Blue grama | Lower |
| JUOS | Juniperus osteosperma | Utah juniper | Upper |

Description

Site dominated by widely spaced old juniper. Grasses (e.g., *Bouteloua gracilis*, *Hesperostipa comata*) present on microsites sites with deeper soils (>20in) with restricting clay subsurface horizon. Potential maximum overstory coverage is greater in those stands with pinyon as compared to those with only juniper.

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

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:OPN | 0 | Early1:CLS | 9 |
| Early1:CLS | 10 | Mid1:OPN | 29 |
| Mid1:OPN | 30 | Late1:OPN | 99 |
| Late1:OPN | 100 | Late1:CLS | 399 |
| Late1:CLS | 400 | Late1:CLS | 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** |
| Mixed Fire | Early1:OPN | Early1:OPN | 0.003 | 333 | No | 0 |
| Replacement Fire | Early1:OPN | Early1:OPN | 0.01 | 100 | Yes | 0 |
| Mixed Fire | Early1:CLS | Mid1:OPN | 0.01 | 100 | Yes | 0 |
| Replacement Fire | Early1:CLS | Early1:OPN | 0.01 | 100 | Yes | 0 |
| Replacement Fire | Mid1:OPN | Early1:OPN | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Late1:OPN | Early1:OPN | 0.002 | 500 | Yes | 0 |
| Mixed Fire | Late1:OPN | Late1:OPN | 0.005 | 200 | No | 0 |
| Surface Fire | Late1:OPN | Late1:OPN | 0.01 | 100 | No | 0 |
| Replacement Fire | Late1:CLS | Early1:OPN | 0.002 | 500 | Yes | 0 |

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