11170

Southern Rocky Mountain Ponderosa Pine Savanna

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Steppe/Savanna

Map Zones

13, 15, 28

Geographic Range

Central and northern New Mexico and Arizona, southern Colorado, possibly southern Utah.

Biophysical Site Description

1,970-2,575m in elevation on a variety of topographic features, including mountains, mesas, and canyons. Mean annual precipitation ranges from ~16-25in. Biophysical Setting (BpS) is best described as a savanna that has widely spaced (>150yrs old) *Pinus ponderosa*.

Vegetation Description

Overstory canopy of ponderosa pine with a grassy understory, predominantly the bunchgrasses Arizona fescue and mountain muhly. May include sites with minor cover of Gambel oak (<15% cover).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PIPO | *Pinus ponderosa* | Ponderosa pine |
| FEAR2 | *Festuca arizonica* | Arizona fescue |
| MUMO | *Muhlenbergia montana* | Mountain muhly |

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

Disturbance Description

Mean composite surface fire intervals have been found to be 5-15yrs (Swetnam and Baisan 1996). Infrequent stand-replacement fire on the order of a few hundred years possible (300-500yrs?). Drought and other weather events (e.g., blowdown), parasites, and disease may play a minor role and have very long rotations. Insects may be a significant but infrequent occurrence.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 367 | 3 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) | 11 | 97 |  |  |
| All Fires | 11 | 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

Landscape scale (1,000s to tens of 1,000s of acres) (Swetnam and Baisan 1996).

Adjacency or Identification Concerns

Issues or Problems

Replacement fire rotation uncertain, and this affects the amount of forest in each class.

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 | C | C | C | C | C | B | B | B | B | B |
| Tree | 10-25 | D | D | D | D | D | E | E | E | E | E |
| Tree | 25-50 | D | D | D | D | D | E | E | E | E | E |
| Tree | >50 | D | D | D | D | D | E | E | E | E | E |

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 10 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| FEAR2 | Festuca arizonica | Arizona fescue | Lower |
| MUMO | Muhlenbergia montana | Mountain muhly | Lower |
| PIPO | Pinus ponderosa | Ponderosa pine | All |

Description

Bunchgrass-dominated (<90% canopy cover and any height). Some ponderosa pine individuals also becoming established.

*Maximum Tree Size Class*  
Seedling <4.5ft

Class B 2 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPO | Pinus ponderosa | Ponderosa pine | Lower |
| FEAR2 | Festuca arizonica | Arizona fescue | Lower |
| MUMO | Muhlenbergia montana | Mountain muhly | Lower |

Description

Small and medium-sized ponderosa pine, still with high bunchgrass cover. Closed canopy defined as >50%.

*Maximum Tree Size Class*  
Pole 5-9" DBH

Class C 23 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPO | Pinus ponderosa | Ponderosa pine | Upper |
| FEAR2 | Festuca arizonica | Arizona fescue | Lower |
| MUMO | Muhlenbergia montana | Mountain muhly | Lower |

Description

Small and medium-sized ponderosa pine, with moderate bunchgrass cover. Open canopy defined as 10-49%.

*Maximum Tree Size Class*  
Pole 5-9" DBH

Class D 61 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPO | Pinus ponderosa | Ponderosa pine | Upper |
| FEAR2 | Festuca arizonica | Arizona fescue | Lower |
| MUMO | Muhlenbergia montana | Mountain muhly | Lower |

Description

Large and very large old growth ponderosa pine, with medium to high cover of bunchgrasses. Old growth attributes prominent, including down wood, snags, and diseased trees.

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

Class E 4 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPO | Pinus ponderosa | Ponderosa pine | Upper |
| FEAR2 | Festuca arizonica | Arizona fescue | Lower |
| MUMO | Muhlenbergia montana | Mountain muhly | Lower |

Description

Large and very large old growth ponderosa pine, with medium cover of bunchgrasses. Old growth attributes prominent, including down wood, snags, and diseased trees.

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

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:OPN | 49 |
| Mid1:OPN | 50 | Late1:OPN | 149 |
| Mid1:CLS | 50 | Late1:CLS | 149 |
| Late1:OPN | 150 | Late1:OPN | 999 |
| Late1:CLS | 150 | 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** |
| Alternative Succession | Early1:ALL | Mid1:CLS | 0.01 | 100 | Yes | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Surface Fire | Mid1:OPN | Mid1:OPN | 0.1 | 10 | No | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Surface Fire | Mid1:CLS | Mid1:OPN | 0.05 | 20 | Yes | 0 |
| Surface Fire | Mid1:CLS | Mid1:CLS | 0.05 | 20 | No | 0 |
| Alternative Succession | Late1:OPN | Late1:CLS | 0.003 | 333 | Yes | 0 |
| Replacement Fire | Late1:OPN | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Surface Fire | Late1:OPN | Late1:OPN | 0.1 | 10 | No | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Surface Fire | Late1:CLS | Late1:OPN | 0.05 | 20 | Yes | 0 |
| Surface Fire | Late1:CLS | Late1:CLS | 0.05 | 20 | No | 0 |

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