11650

Northern Rocky Mountain Foothill Conifer Wooded Steppe

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
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Vegetation Type

Steppe/Savanna

Map Zone

9

Geographic Range

Primarily found east of the Continental Divide in northern Montana (west of Billings), eastern Idaho, and Wyoming.

Biophysical Site Description

These savannas occur at the lower treeline/ecotone between grassland or shrubland and more mesic coniferous forests typically in warm, dry, exposed sites. Elevations range from <500m in British Columbia to 1,600m in mountains in central Idaho. Occurrences are found on all slopes and aspects; however, moderately steep to very steep slopes or ridgetops are most common. This ecological system generally occurs on glacial till, glacio-fluvial sand and gravel, dune, basaltic rubble, colluvium, and deep loess or volcanic ash-derived soils, with characteristic features of good aeration and drainage, coarse textures, circumneutral to slightly acid pH, an abundance of mineral material, rockiness, and periods of drought during the growing season. These savannas in the eastern Cascades, Okanogan, and northern Rockies regions receive winter and spring rains and thus have a greater spring "green-up" than the drier woodlands and savannas in the central Rockies.

Vegetation Description

Generally dominated by Douglas-fir with incidental ponderosa pine and/or limber pine. Understory of bunchgrasses and sparse shrubs. Stands are typically open and dominated by moderate- to large-diameter Douglas-fir.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PSME | *Pseudotsuga menziesii* | Douglas-fir |
| PIPO | *Pinus ponderosa* | Ponderosa pine |
| PIFL | *Pieris floribunda* | Mountain fetterbush |
| ARTRV | *Artemisia tridentata ssp. vaseyana* | Mountain big sagebrush |
| JUCO | *Juncus compressus* | Roundfruit rush |
| JUSC | *Juncus scirpoides* | Needlepod rush |
| PSSP6 | *Pseudoroegneria spicata* | Bluebunch wheatgrass |
| FEID | *Festuca idahoensis* | Idaho fescue |

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

Disturbance Description

Fire regime is predominantly (70%) frequent, low-severity fires with a mean fire return interval (MFRI) of ~30yrs. Mixed-severity fires occur with a typical frequency of 30-50yrs primarily in dense stands (Class B and Class E). Native American burning may have occurred in many of these low-elevation forests.

Limber pine may be affected by blister rust.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 208 | 9 | 100 | 300 |
| Moderate (Mixed) | 152 | 12 |  |  |
| Low (Surface) | 23 | 79 | 15 | 40 |
| All Fires | 18 | 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

Since this type is dominated by surface fires and because this type represents an ecotone, patches tended to be smaller in size. Consequently, fire sizes were also relatively small. Analysis areas of several thousand acres would probably be adequate.

Adjacency or Identification Concerns

This BpS corresponds with cool, dry Douglas-fir and limber pine habitat types (Pfister et al. 1977), including PSME/ARUV, PSME/AGSP, PIFL/AGSP, PIFL/FEID/FESC, PIFL/AGSP, and PIFL/FEID. Ecotone with mountain grasslands/sagebrush.

Issues or Problems

Native Uncharacteristic Conditions

Comments

Additional reviewers were John DiBari (jndibari@yahoo.com), Steve Barrett (sbarrett@mtdig.net), and Lee Clark (lwclark@fs.fed.us).

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 | B | B | B | B | B | B | B |
| Tree | 5-10 | C | C | C | B | B | B | B | B | B | B |
| Tree | 10-25 | D | D | D | B | B | B | B | B | B | B |
| Tree | 25-50 | D | D | D | B | B | B | B | B | B | B |
| Tree | >50 | D | D | D | B | B | B | B | B | B | B |

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 9 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PSME | Pseudotsuga menziesii | Douglas-fir | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Lower |
| ARTRV | Artemisia tridentata ssp. vaseyana | Mountain big sagebrush | Lower |
| PIFL | Pieris floribunda | Mountain fetterbush | Upper |

Description

Dominated by bunchgrasses, mountain sagebrush, and seed/sapling-sized Douglas-fir. Limber pine and ponderosa pine may be present in varying amounts.

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

Class B 2 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PSME | Pseudotsuga menziesii | Douglas-fir | Upper |
| PIFL | Pieris floribunda | Mountain fetterbush | Upper |

Description

Relatively dense pole- and/or large-sized Douglas-fir. Limber pine and ponderosa pine may be present in varying amounts. Sagebrush has largely dropped out of the stand. Mixed-severity fire may open up the canopy.

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

Class C 6 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PSME | Pseudotsuga menziesii | Douglas-fir | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Lower |
| ARTRV | Artemisia tridentata ssp. vaseyana | Mountain big sagebrush | Lower |
| PIFL | Pieris floribunda | Mountain fetterbush | Upper |

Description

Open poles of Douglas-fir with bunchgrass and sagebrush understory. Limber pine and ponderosa pine may be present in varying amounts. Surface fires maintain the open condition.

*Maximum Tree Size Class*  
None

Class D 83 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PSME | Pseudotsuga menziesii | Douglas-fir | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Lower |
| ARTRV | Artemisia tridentata ssp. vaseyana | Mountain big sagebrush | Lower |
| PIFL | Pieris floribunda | Mountain fetterbush | Upper |

Description

Widely spaced, open canopy of medium- to large-diameter Douglas-fir with bunchgrass and sagebrush understory. Canopy fuels are discontinuous. Limber pine and ponderosa pine may be present in varying amounts. Surface fires maintain the open condition.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:OPN | 29 |
| Mid1:OPN | 30 | Late1:OPN | 89 |
| Mid1:CLS | 30 | Mid1:CLS | 999 |
| Late1:OPN | 90 | Late1:OPN | 989 |

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 | 1 | 1 | Yes | 28 |
| Wind or Weather or Stress | Early1:ALL | Early1:ALL | 0.033 | 30 | Yes | 0 |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.05 | 20 | Yes | 0 |
| Mixed Fire | Early1:ALL | Early1:ALL | 0.05 | 20 | No | 0 |
| Alternative Succession | Mid1:OPN | Mid1:CLS | 1 | 1 | Yes | 45 |
| Insects or Disease | Mid1:OPN | Mid1:OPN | 0.001 | 1000 | No | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.001 | 1000 | Yes | 0 |
| Mixed Fire | Mid1:OPN | Mid1:OPN | 0.01 | 100 | No | 0 |
| Wind or Weather or Stress | Mid1:OPN | Mid1:OPN | 0.033 | 30 | No | 0 |
| Surface Fire | Mid1:OPN | Mid1:OPN | 0.05 | 20 | No | 0 |
| Insects or Disease | Mid1:CLS | Mid1:OPN | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Mixed Fire | Mid1:CLS | Mid1:OPN | 0.025 | 40 | Yes | 0 |
| Wind or Weather or Stress | Mid1:CLS | Mid1:OPN | 0.033 | 30 | Yes | 0 |
| Insects or Disease | Late1:OPN | Late1:OPN | 0.001 | 1000 | No | 0 |
| Mixed Fire | Late1:OPN | Early1:ALL | 0.001 | 1000 | Yes | 0 |
| Wind or Weather or Stress | Late1:OPN | Late1:OPN | 0.03 | 33 | No | 0 |
| Surface Fire | Late1:OPN | Late1:OPN | 0.05 | 20 | No | 0 |

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