11650

Northern Rocky Mountain Foothill Conifer Wooded Steppe

BpS Model/Description Version: Aug. 2020

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| None | None | None | None |

Vegetation Type

Steppe/Savanna

Map Zones

1, 7, 8

Geographic Range

This system is found along the periphery of the Columbia Basin along the lower foothills of the eastern Cascades, the southern foothills of the Blues and Wallowas, and in northern California along the southern Cascades.

Biophysical Site Description

These savannas occur at the lower tree line/ecotone between grassland or shrubland; more mesic coniferous forests are seen typically in warm, dry, exposed or shallow-soil sites. Elevations range from <500m in British Columbia to 1,600m in the central Idaho mountains. 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, glacial-fluvial sand and gravel, dune, basaltic rubble, and colluvium to deep loess or volcanic ash-derived soils, with characteristic features of good aeration and drainage, coarse texture, circumneutral to slightly acidic pH, an abundance of mineral material, rockiness, and periods of drought during the growing season. These savannas in the eastern Cascades, Okanagan, 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. In Oregon, in the foothills of the Blue Mountains, this type may occur as outlier groves of pines in sagebrush steppes at low elevations, especially on cool, moist sites.

Vegetation Description

*Pinus ponderosa* (primarily *var. ponderosa*) is the primary conifer in the Pacific states, occasionally occurring with *Juniperus occidentalis*. Understory vegetation in the true savanna occurrences is predominantly fire-resistant shrubs (and sometimes grasses and forbs) that resprout following surface fires; understory trees and downed logs are uncommon. Important species include *Artemisia tridentata* ssp. *vaseyana*, *Purshia tridentata*, *Chrysothanmus viscidiflorus*, and Ribes cerum. Grasses, when present, include *Pseudoroegneria spicata*, *Leucopoa kingii*, *Hesperostipa* spp., *Achnatherum* spp., *Festuca idahoensis*, or *Festuca campestris*.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PIPO | *Pinus ponderosa* | Ponderosa pine |
| FEID | *Festuca idahoensis* | Idaho fescue |
| ARTRV | *Artemisia tridentata ssp. vaseyana* | Mountain big sagebrush |

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

Disturbance Description

This type usually has so little surface fuel that replacement fire would be a function of high winds. However, surface fuels are dense enough to carry relatively frequent fires.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 125 | 43 |  |  |
| Moderate (Mixed) | 400 | 14 |  |  |
| Low (Surface) | 127 | 43 |  |  |
| All Fires | 54 | 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

Occasionally, this type is in patches as small as a few acres on rimrock and exposed sites or in places where snowmelt may accumulate. However, the type also occurs in large patches on edaphic sites.

Adjacency or Identification Concerns

A century of anthropogenic disturbance and fire suppression has resulted in a greater density of *Juniperus occidentalis* or *Pinus ponderosa*, altering the fire regime and species composition. Currently, many stands contain understories of more shade-tolerant species.

Issues or Problems

Very little data on this type. There are pines, but scar studies have not focused on this type, and (anecdotally) there are few scars on these pines. The current model attempts to describe the limited area that could be trees, leaving the surrounding shrub (mountain big sagebrush or canyon grassland) and grass modeled in other Biophysical Settings (BpSs).

Native Uncharacteristic Conditions

Comments

MZs 1, 7, and 8 were combined during 2015 BpS review.

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

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 25 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPO | Pinus ponderosa | Ponderosa pine | Upper |
| ARTRV | Artemisia tridentata ssp. vaseyana | Mountain big sagebrush | Low-Mid |

Description

These young patches following replacement fire recover quickly in grasses and shrubs. Fires that kill the overstory occasionally reset the stand, but most fires allow quite a few of the trees to survive. Some areas of this type only transition to grassland (Snake River canyon, etc.; modeled as AltSucc).

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

Class B 16 Late Development 1 - Open

Upper Layer Lifeform Is Not the Dominant Lifeform

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPO | Pinus ponderosa | Ponderosa pine | Upper |
| FEID | Festuca idahoensis | Idaho fescue | Lower |
| PSSP6 | Pseudoroegneria spicata | Bluebunch wheatgrass | Lower |

Description

This class is a savanna with grass understory of nearly 100% cover. The upper layer of trees may have a canopy cover of 0-40%, but was defined as 0-20% to keep it distinguishable. For mapping, if surrounding pixels are grass, tree canopy closure in this class could range from 0-40%.

These established stands are maintained in savanna by surface fires. Replacement fire resets.

*Maximum Tree Size Class*  
Very Large >33" DBH

Class C 59 Late Development 2 - Closed

Upper Layer Lifeform Is Not the Dominant Lifeform

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPO | Pinus ponderosa | Ponderosa pine | Upper |
| ARTRV | Artemisia tridentata ssp. vaseyana | Mountain big sagebrush | Low-Mid |

Description

This class is a savanna with shrub understory of 50-60% closure. The upper layer of trees may have a canopy cover of 0-40%, but was defined as 21-40% to keep it distinguishable. For mapping, if surrounding pixels are shrub, tree canopy closure in this class could range from 0-40%.

These savanna-shrublands may be surrounded by mountain big sagebrush systems. Replacement fire resets. Surface fire maintains.

*Maximum Tree Size Class*  
Very Large >33" DBH

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Late2:CLS | 40 |
| Late1:OPN | 41 | Late1:OPN | 999 |
| Late2:CLS | 41 | Late2: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 | Late1:OPN | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.008 | 125 | Yes | 0 |
| Mixed Fire | Early1:ALL | Early1:ALL | 0.01 | 100 | No | 0 |
| Replacement Fire | Late1:OPN | Early1:ALL | 0.008 | 125 | Yes | 0 |
| Surface Fire | Late1:OPN | Late1:OPN | 0.013 | 77 | No | 0 |
| Replacement Fire | Late2:CLS | Early1:ALL | 0.008 | 125 | Yes | 0 |
| Surface Fire | Late2:CLS | Late2:CLS | 0.01 | 100 | No | 0 |

References

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