11610

Northern Rocky Mountain Conifer Swamp

BpS Model/Description Version: Aug. 2020

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

Woody Wetland

Map Zones

9, 10, 19

Geographic Range

Northern Rocky Mountains from northwestern WY north into the Canadian Rockies and west into eastern OR and WA. Most common where the inland Pacific maritime influence is strongest. The biggest expanse of late-successional status currently is from Upper Priest Lake, ID to the Canadian border.

Biophysical Site Description

Poorly drained soils that are saturated a significant portion of the growing season may have seasonal flooding in the spring. Soils conditions may include exposed rock and gravel at the surface or, more rarely, organic matter. Stands generally occupy sites on benches, toe slopes or valley bottoms along mountain streams. May occupy upland sites (especially on northerly aspects) where high water table allows saturation part of the growing season.

Vegetation Description

Composition will vary geographically, but is generally dominated by large, old *Picea engelmannii*. *Thuja plicata* may be present on warm-wet lowland sites as well. Large downed logs are often common (50 tons/acre possible). Large old cedars tend to have heartrot.

Understory associates will vary widely geographically, but include *Oplopanax horridum* (devil's club), *Athyrium filix-femina*, *Dryopteris* spp, *Lysichiton americanus*, *Gymnocarpium dryopteris*, *Equisetum arvense*, *Senecio triangularis*, *Mitella breweri* (colder and wetter end of the range), *Mitella pentandra*, *Streptopus amplexifolius*, and *Calamagrostis canadensis* (colder and wetter end of the range).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PIEN | *Picea engelmannii* | Engelmann spruce |
| THPL | *Thuja plicata* | Western red cedar |

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

Disturbance Description

Fire regime group V with rare stand replacement fires (>200yrs+). Fire frequency is highly dependent on adjacent vegetation and relative patch size compared to the surrounding matrix. In the subalpine zone, these systems act as fuel breaks. However, frequency of fire is increased where drainage is oriented with prevailing wind. Fuel loading in adjacent vegetation may sometimes be important. Small patch fire events (individual lightning strikes) may occur within patches, but do not meet the threshold of mixed severity fire.

Openings the overstory canopy often results in windthrow (Williams et al. 1995).

Spruce beetle outbreaks may occur and be linked to subsequent fire events.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 377 | 100 | 250 | 750 |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 377 | 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

Linear features and smaller patches. 10s-1,000s of acres in size.

Adjacency or Identification Concerns

The wetland types are generally distinguishable from other upland forests and woodlands by shallow water tables and mesic or hydric undergrowth vegetation.

Issues or Problems

This is typically a small patch system and may be difficult to map.

This is a relatively stable ecosystem dominated by positive feedback mechanisms and so they were highly variable over space and time. Variability was dependent on patch size, native burning and adjacent vegetation.

Native Uncharacteristic Conditions

Comments

MZs 9, 10 and 19 were combined during 2015 BpS Review.

Art Zack (azack@fs.fed.us) and Craig Glazier (cglazier@fs.fed.us) provided input to an earlier version of this model.

In general, modelers and reviewers had trouble with the NatureServe description of this type, as it combines two very different systems-- upland redcedar groves and lowland, seasonally flooded conifer (spruce) bogs. The upland redcedar type was split into a separate model for MZs 10 and 19 (10472), and this "conifer swamp" type was modeled differently than the NatureServe description.

As a result of peer review, mixed severity fire was removed from the model. Peer review resulted in general concern that this system is too small in concept compared to other BpS and should not be included in LANDFIRE.

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 | B | B | B | B | B | B |
| Tree | 10-25 | B | B | B | B | B | B | B | B | B | B |
| Tree | 25-50 | C | C | C | C | C | C | C | C | C | C |
| Tree | >50 | C | C | 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 9 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIEN | Picea engelmannii | Engelmann spruce | Mid-Upper |

Description

Sprouting riparian shrubs and deciduous trees, such as black cottonwood, Douglas maple, willow and birch. Engelmann spruce and some other conifers may be regenerating. Nurse crops of white pine, lodgepole, or cottonwood may comprise this class, in which case tree heights would be very tall (>30m).

The probability of fire is highest in this class and fires will often creep in from adjacent vegetation types.

Loss of large trees post-burn can alter the water table and reduce subsequent tree regeneration, causing this class to last many years.

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

Class B 23 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIEN | Picea engelmannii | Engelmann spruce | Upper |

Description

Typically closed overstory of Engelmann spruce. Riparian deciduous species present but not dominant.

*Maximum Tree Size Class*  
None

Class C 68 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIEN | Picea engelmannii | Engelmann spruce | Upper |

Description

Typically closed canopy, old Engelmann spruce trees. Canopy closure tends to be >60%.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 39 |
| Mid1:CLS | 40 | Late1:CLS | 149 |
| 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** |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.0025 | 400 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Early1:ALL | 0.0001 | 10000 | Yes | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.0025 | 400 | Yes | 0 |

References

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