11610

Northern Rocky Mountain Conifer Swamp

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Woody Wetland

Map Zones

21

Geographic Range

Northern Rocky Mountains from western WY and eastern ID. Scattered areas within M331Aa, M331Ae, M331Db and M331Ab (Cleland et al. 2007).

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, toeslopes 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. Lodgepole pine areas are mainly found in Island Park area.

Vegetation Description

Composition will vary geographically, but is generally dominated by large, old *Picea engelmannii*. Large downed logs are often common (50 tons/acre possible). Lodgepole pine may be present in some areas. Large dead snags are present.

Understory associates will vary widely geographically, but include *Actaea rubra*, *Equisetum arvense*, *Senecio triangularis*, *Epilobium angustifoilium*, *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 (>300yrs+). 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 in 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 | 392 | 100 | 250 | 750 |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 392 | 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. 1-10s 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 so were highly variable over space and time. Variability was dependent on patch size, native burning and adjacent vegetation.

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 | A | B | B | B | B | B | B | B | B | B |
| Tree | 10-25 | A | C | C | C | C | C | C | C | C | C |
| Tree | 25-50 | A | C | C | C | C | C | C | C | C | C |
| Tree | >50 | A | 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 27 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIEN | Picea engelmannii | Engelmann spruce | Mid-Upper |
| PICO | Pinus contorta | Lodgepole pine | Mid-Upper |

Description

Engelmann spruce and some other conifers may be regenerating. Loss of large trees post-burn can alter the water table and reduce subsequent tree regeneration, causing this class to last many years. Riparian sprouting species may be considered trees or shrubs. Nurse crops of white pine, lodgepole, or cottonwood may comprise this class, in which case tree heights would be very tall (>30m).

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

Class B 50 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIEN | Picea engelmannii | Engelmann spruce | Upper |
| PICO | Pinus contorta | Lodgepole pine | Upper |

Description

Typically closed overstory of Engelmann spruce. Riparian deciduous species present but not dominant. Lodgepole pine communities in this class would be open, however, as the fluctuating water table is going to keep densities low.

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

Class C 23 Late Development 1 - Closed

Indicator Species

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

Description

Typically closed, old Engelmann spruce 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: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 | 0.0025 | 400 | Yes | 0 |
| Competition or Maintenance | Early1:ALL | Early1:ALL | 0.013 | 77 | No | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.0025 | 400 | Yes | 0 |
| Wind or Weather or Stress | Mid1:CLS | Mid1:CLS | 0.004 | 250 | No | 0 |
| Alternative Succession | Mid1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.0025 | 400 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Insects or Disease | Late1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |

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