10472

Northern Rocky Mountain Mesic Montane Mixed Conifer Forest - Cedar Groves

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
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| None | None | None | None |
| None | None | None | None |

Vegetation Type

Forest and Woodland

Map Zones

10, 19

Model Splits or Lumps

This Biophysical Setting (BpS) is split into multiple models: nearly pure cedar groves, with much longer fire return intervals, have been split from the more common cedar-hemlock type (BpS 10471).

Geographic Range

Occurs in the maritime-influenced zone of northern Idaho and northwestern Montana.

Biophysical Site Description

Wet canyon bottoms and toe slopes <5,000ft elevation; generally small to moderate-size "stringer" groves dominated by *Thuja plicata* that often escape burning during fires on adjacent slopes.

Vegetation Description

Sheltered groves of nearly pure uneven aged *Thuja plicata*, with occasional minor associates *Abies grandis*, *Tsuga heterophylla*, and *Larix occidentalis*. Understories are usually dominated by low-growing forbs and ferns such as *Asarum caudatum*, *Viola orbiculata*, *Clintonia uniflora*, *Tiarella trifoliata*, *Coptis occidentalis*, *Oplopanax horridum*, *Athyrium filix-femina*, and *Adiantum pedatum*.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| THPL | *Thuja plicata* | Western red cedar |
| ABGR | *Abies grandis* | Grand fir |
| LAOC | *Larix occidentalis* | Western larch |

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

Disturbance Description

Long-interval stand-replacement fire regime (200-500yrs) with occasional mixed-severity fires (i.e., burn margin effect from fires on adjacent drier slopes).

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 382 | 84 | 75 | 1000 |
| Moderate (Mixed) | 2027 | 16 |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 321 | 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

Stand-replacing disturbances tended to be extensive in the surrounding landscape, but smaller patches of mixed-severity fire can occur during less-severe fire weather. This vegetation type represents relatively small imbedded "fire refugia," where *Thuja plicata* groves can persist for 500-1,000yrs between stand-replacement fires.

Adjacency or Identification Concerns

Type transitions to cedar/hemlock types (10471) with increasing slope steepness and elevation. This type is distinguished by the more mesic conditions (i.e., riparian areas, draws, and canyon bottoms) and composition of pure or nearly pure western red cedar.

Issues or Problems

Should seek reviewer advice about the roles of diseases; root rots and other fungi were important in stand successional patterns and pathways but mostly for producing local gap-phase openings rather than stand replacement.

Native Uncharacteristic Conditions

Comments

Map zones 10 and 19 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 | 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 | B | B | B | B | B | B |
| Tree | 10-25 | C | C | C | C | B | B | B | B | B | B |
| Tree | 25-50 | D | D | D | D | E | E | E | E | E | E |
| Tree | >50 | D | D | D | D | E | 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 7 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| CLUN | Clarkia unguiculata | Elegant clarkia | Lower |
| ADPE | Adiantum pedatum | Northern maidenhair | Lower |
| ATFI | Athyrium filix-femina | Common ladyfern | Lower |
| THPL | Thuja plicata | Western red cedar | Upper |

Description

Post-burn sites dominated by forbs, ferns, and shrubs; tree regeneration generally consists of western red cedar and grand fir seedlings to saplings. Herbaceous layer will be up to 100% cover and may dominate prior to the development of cedar and hemlock saplings.

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

Class B 41 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| THPL | Thuja plicata | Western red cedar | Upper |

Description

Moderate to heavy regeneration of pole-size western red cedar. Occasional grand fir, western larch, and other species may be present.

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

Class C 7 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| THPL | Thuja plicata | Western red cedar | Upper |

Description

Uncommon mid-open successional class resulting after mixed-severity fire and blowdowns; dominated by western red cedar with occasional grand fir and western larch. The scale of open classes would be primarily local rather than landscape (i.e., gap-phase openings within stands).

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

Class D 4 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| THPL | Thuja plicata | Western red cedar | Upper |

Description

Uncommon mid-late open successional class resulting after mixed-severity fire, blowdowns, and disease; dominated by western red cedar with occasional grand fir and western larch. The scale of open classes would be primarily local rather than landscape (i.e., gap-phase openings within stands).

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

Class E 41 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| THPL | Thuja plicata | Western red cedar | Upper |
| ABGR | Abies grandis | Grand fir | None |

Description

Moderately dense to densely stocked old growth groves dominated by western red cedar; generally depauperate understories as a result of heavy shading.

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

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 19 |
| Mid1:OPN | 20 | Mid1:CLS | 39 |
| Mid1:CLS | 20 | Late1:CLS | 99 |
| Late1:OPN | 100 | Late1:CLS | 119 |
| Late1:CLS | 100 | 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 | 0.002 | 500 | Yes | 0 |
| Mixed Fire | Mid1:OPN | Mid1:OPN | 0.0008 | 1250 | No | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.0017 | 588 | Yes | 0 |
| Mixed Fire | Mid1:CLS | Mid1:OPN | 0.0005 | 2000 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.0028 | 357 | Yes | 0 |
| Insects or Disease | Mid1:CLS | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Insects or Disease | Mid1:CLS | Mid1:OPN | 0.0033 | 303 | Yes | 0 |
| Mixed Fire | Late1:OPN | Late1:OPN | 0.001 | 1000 | No | 0 |
| Replacement Fire | Late1:OPN | Early1:ALL | 0.0028 | 357 | Yes | 0 |
| Mixed Fire | Late1:CLS | Late1:OPN | 0.0005 | 2000 | Yes | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.0028 | 357 | Yes | 0 |
| Insects or Disease | Late1:CLS | Mid1:OPN | 0.005 | 200 | Yes | 0 |
| Insects or Disease | Late1:CLS | Late1:OPN | 0.005 | 200 | Yes | 0 |

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