10630

North Pacific Broadleaf Landslide Forest and Shrubland

BpS Model/Description Version: Aug. 2020/20/06 14

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| --- | --- | --- | --- |
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| None | None | None | None |

Vegetation Type

Forest and Woodland

Map Zones

1

Geographic Range

These forests and shrublands occur throughout the northern Pacific Mountains, becoming less prominent in the northern half of this region.

Biophysical Site Description

These forests and shrublands occur as dynamic successional patches (large patch in character), on relatively moist sites, many of which have seasonally fluctuating water tables. These systems also occur on steep slopes and bluffs that are susceptible to mass movements, where they are found in patches of differing age associated with different landslide events.

Vegetation Description

The vegetation is deciduous broadleaf forest, sometimes with varying components of conifers. *Alnus rubra* and *Acer macrophyllum* are the major species.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| ALRU2 | *Alnus rubra* | Red alder |
| ACMA3 | *Acer macrophyllum* | Bigleaf maple |

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

Disturbance Description

Primary disturbance is landslide, which results in poor soil quality; therefore, succession reverts to species that can provide some of their own nitrogen. After decades of this vegetation type, soil nitrogen and carbon have increased notably. Fires tend to be stand-replacing due to the continuity of fuels. These stands, however, are fire resistant, so they serve to impede the fires that come from outside the type. These fires are also commonly associated with synoptic weather events.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 453 | 67 |  |  |
| Moderate (Mixed) | 905 | 33 |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 302 | 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

These patches tend to occur in broad swaths associated with mass movements. Patches are commonly in the 10s to 100s of acres.

Adjacency or Identification Concerns

Adjacent forests would be the variety of upland forest types. These species occur from the lowlands to the subalpine zone, though, with higher elevation and steeper gradients, the type may lean toward avalanche chute vegetation.

Issues or Problems

The modelers were not familiar with this type.

Native Uncharacteristic Conditions

Comments

Jan Henderson, Jimmy Kagan, and Rex Crawford provided input on the fire return interval for this type.

**Model Parameters**

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Late1:ALL | 30 |
| Late1:ALL | 31 | Late1:ALL | 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** |
| Mixed Fire | Early1:ALL | Early1:ALL | 0.0011 | 909 | No | 0 |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.0022 | 455 | Yes | 0 |
| Optional 1 | Early1:ALL | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Mixed Fire | Late1:ALL | Early1:ALL | 0.0011 | 909 | Yes | 0 |
| Replacement Fire | Late1:ALL | Early1:ALL | 0.0022 | 455 | Yes | 0 |
| Optional 1 | Late1:ALL | Early1:ALL | 0.005 | 200 | Yes | 0 |

**SUCCESSION PATHWAYS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **BpS** | **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| 0110630 | Early1:ALL | 0 | Late1:ALL | 30 |
| 0110630 | Late1:ALL | 31 | Late1:ALL | 999 |

**DISTURBANCE PATHWAYS**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **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** |
| MixedFire | Early1:ALL | Early1:ALL | 0.0011 | 909 | No |  |
| Optional1 | Early1:ALL | Early1:ALL | 0.0050 | 200 | No |  |
| ReplacementFire | Early1:ALL | Early1:ALL | 0.0022 | 455 | No |  |
| MixedFire | Late1:ALL | Early1:ALL | 0.0011 | 909 | Yes |  |
| Optional1 | Late1:ALL | Early1:ALL | 0.0050 | 200 | Yes |  |
| ReplacementFire | Late1:ALL | Early1:ALL | 0.0022 | 455 | Yes |  |

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 | A | A | A | A | A | A | A | A | A |
| Tree | 10-25 | B | B | B | B | B | B | B | B | B | B |
| Tree | 25-50 | B | B | B | B | B | B | B | B | B | B |
| Tree | >50 | B | B | B | 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 22 Early Development 1 - All Structures

Upper Layer Lifeform: Tree

Upper Layer Canopy Cover: 0 - 100%

Upper Layer Canopy Height: Tree 0m - Tree 10m

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ALRU2 | Alnus rubra | Red alder | Upper |

Description

Alder is the primary responder immediately after a major disturbance. Eventually, bigleaf maple may get established, but in this stage, it is no more than a rare codominant. Succession to Class B. Replacement fire could occur. Landslides may occur, but are rarer than the fires. Mixed severity fires would be minimal, though possible.

*Maximum Tree Size Class*  
None

Class B 78 Late Development 1 - All Structures

Upper Layer Lifeform: Tree

Upper Layer Canopy Cover: 0 - 100%

Upper Layer Canopy Height: Tree 10.1m - Tree 50m

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ACMA3 | Acer macrophyllum | Bigleaf maple | Upper |
| ALRU2 | Alnus rubra | Red alder | Mid-Upper |

Description

These mature patches are starting to be dominated by bigleaf maple. Although the alder may hang around in the stand for a few more decades, it is on the decline. Replacement fire occurs. Though landslides may occur, they are rarer than the fires. Mixed-severity fires would be minimal, though possible.

*Maximum Tree Size Class*  
None

Model Parameters

Optional Disturbances

Optional 1: Landslide

References

Agee, James K. 1993. Fire Ecology of Pacific Northwest Forests. Washington, DC: Island Press. 493 pp.

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NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. Data current as of 10 February 2007.