11730

North Pacific Wooded Volcanic Flowage

BpS Model/Description Version: Aug. 2020

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

Reviewers: Kathleen S. Roche, Kori Blankenship

Vegetation Type

Forest and Woodland

Map Zones

1, 7

Geographic Range

This uncommon system is found in the east and west Cascades of Washington and Oregon, and may occur in northern California around Mounts Lassen and Shasta.

Biophysical Site Description

This biophysical (BpS) system is found from foothill to subalpine elevations and includes woodland to sparsely vegetated landscapes (generally >10% plant cover) on recent lava flows. Examples of recent lava flows occur on the north side of Mount Adams (andesite) and the big lava beds (basalt) south of Indian Heaven, west of Mount Adams in Washington. Oregon examples include the lahars at Old Maid Flat west of Mount Hood and areas in central Oregon from McKenzie Pass south around the Three Sisters, Broken Top, Mount Bachelor, and Paulina Peak, and the Newberry Crater. In central Oregon, this BpS is found on Mazama pumice deposits.

Vegetation Description

These areas support an open to sparse tree cover; characteristic species include *Pseudotsuga menziesii*, *Pinus contorta*, *Pinus monticola*,and *Abies lasiocarpa*. In the Lava Case Forest area of central Oregon, an *Abies concolor-Abies grandis* hybrid is found on forest isolates (Arabas et al. 2006; Pohl 2006). Tree cover can range from 10-70%. There may be scattered to dense shrubs present, such as *Acer circinatum*, *Vaccinium membranaceum*, *Arctostaphylos uva-ursi*, *Mahonia nervosa*, *Amelanchier alnifolia*,and *Xerophyllum tenax*. *Ribes cereum*, *Ceanothus velutinus*, *Purshia tridentata*, *Arctostaphylos patula*, *Lupinus argenteus*, *Pyrola picta*,and *Chrysothamnus viscidiflorus* are common understory species in central Oregon (Arabas et al. 2006). Soil development is limited, and mosses and lichens often cover the lava surface.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PSME | *Pseudotsuga menziesii* | Douglas-fir |
| PICO | *Pinus contorta* | Lodgepole pine |
| PIMO3 | *Pinus monticola* | Western white pine |
| ABLA | *Abies lasiocarpa* | Subalpine fir |
| ACCI | *Acer circinatum* | Vine maple |
| VAME | *Vaccinium membranaceum* | Thinleaf huckleberry |
| ARUV | *Arctostaphylos uva-ursi* | Kinnikinnick |
| MANE2 | *Mahonia nervosa* | Cascade barberry |

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

Disturbance Description

These sites are restricted by soil and do not generate a lot of fuel between trees. Mature stands can be park-like, with moss on the forest floor between sizeable stems or, as reported in central Oregon, may have a variety of shrubs (Arabas et al. 2006). These stands can act as fire breaks to all but the fiercest wind-driven events in some areas, but this probably varies across the range of this BpS (described later).

Arabas et al. (2006) found a pre-settlement mean fire return interval of 7yrs on forest isolates in the Lava Cast Forest area in Central Oregon. They also found that forest isolates experienced a greater number of fires and a higher fire frequency than surrounding matrix forests, and that fires were asynchronous between forest isolates and surrounding forest matrix, indicating that lava was an effective -- but not total -- barrier to fire spread.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 490 | 100 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 490 | 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

Patch size is variable. There are extensive patches of PICO-dominated stands along the Oregon Cascades crest near recent (1,000+yrs) volcanic flows. In the Lava Cast Forest of central Oregon, forest isolates (kipukas) range in size from 0.3-113 ha (Pohl 2006).

Adjacency or Identification Concerns

Issues or Problems

Modeler is not familiar with this type.

Native Uncharacteristic Conditions

Comments

Kathleen Roche and Kori Blankenship reviewed this BpS during the 2016 BpS Review. Blankenship noted the current modeled fire frequency (i.e., 500yrs) does not align with the reported frequency for central Oregon (Arabas et al. 2006). However, Blankenship did not recommend changes to the model because there was very little of this BpS mapped in central Oregon and because she did not find any additional literature on fire frequency for this BpS other than the paper by Arabas et al. (2006). The fire frequency of this model, across its range, needs to be reconsidered in future review. It is possible that a distinct model is needed for central Oregon.

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 | 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 13 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PICO | Pinus contorta | Lodgepole pine | Mid-Upper |
| PSME | Pseudotsuga menziesii | Douglas-fir | Upper |
| ACCI | Acer circinatum | Vine maple | Middle |
| VAME | Vaccinium membranaceum | Thinleaf huckleberry | Lower |

Description

For many years after severe fire, these sites are relatively free of vegetation. Conifer and deciduous species may appear stunted.

*Maximum Tree Size Class*  
None

Class B 87 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PSME | Pseudotsuga menziesii | Douglas-fir | Upper |
| PICO | Pinus contorta | Lodgepole pine | Middle |
| PIMO3 | Pinus monticola | Western white pine | Mid-Upper |
| ABLA | Abies lasiocarpa | Subalpine fir | Mid-Upper |

Description

Mature sites may be quite sparse to relatively densely occupied.

*Maximum Tree Size Class*  
Large 21-33" DBH

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Late1:CLS | 70 |
| Late1:CLS | 71 | 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 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.002 | 500 | Yes | 0 |

References

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