16800

Alaskan Pacific Maritime Avalanche Slope Shrubland

BpS Model/Description Version: Nov. 2024

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

Vegetation Type

Shrubland

Map Zones

74, 75, 77, 78

Geographic Range

This Biophysical Setting (BpS) is found on steep mountain slopes from Kodiak Island, south through southeast AK, and into British Columbia.

Biophysical Site Description

Avalanche slopes occur from sea level to treeline where mountain slopes are steep enough to produce frequent snow slides and other large-scale mass wasting zones preventing forest development. Upper avalanche slopes typically have a slope angle of at least 70% but the lower slopes and run-out zones may be much less steep. Soils are shallow and skeletal and are underlain by colluvium and glacial till (NatureServe 2008a).

Vegetation Description

The following information was taken from the draft Maritime Ecological Systems description (NatureServe 2008b):

Sites are usually dominated by *Alnus viridis* ssp*. sinuata* and *Rubus spectabilis*. Other shrubs may include *Sambucus racemosa, Salix alaxensis, S. barclayi, and Oplopanax horridus*. Herbaceous patches are common and are dominated by *Calamagrostis canadensis* and *Chamerion angustifolium*. Other common herbs include *Athyrium filix-femina, Veratrum viride, Heracleum maximum, Streptopus amplexifolius,* and *Aruncus dioicus* (DeVelice et al. 1999; Viereck et al. 1992). Near tree line, forb-sedge meadows replace *Calamagrostis* spp. meadows. Tree seedlings and saplings may be abundant on some slopes but do not emerge as an overstory due to frequent disturbance.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| ALVIS | *Alnus viridis ssp. sinuata* | Sitka alder |
| RUSP | *Rubus spectabilis* | Salmonberry |
| SARA2 | *Sambucus racemosa* | Red elderberry |
| SALIX | *Salix spp.* | Willow |
| OPHO | *Oplopanax horridus* | Devilsclub |
| CACA4 | *Calamagrostis canadensis* | Bluejoint |
| CHAN9 | *Chamerion angustifolium* | Fireweed |
| ATFI | *Athyrium filix-femina* | Common ladyfern |

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

Disturbance Description

This system represents a topoedaphic climax maintained by frequent soil movement disturbance (Viereck et al. 1992). Snow avalanche is the dominant disturbance but mass wasting, including debris avalanches, rock fall, and soil creep, also contributes to the disturbance cycle. Severe slides, often with a debris component, may break branches, bury, or kill shrubs, but recolonization through resprouting is usually rapid. On sites with a less frequent avalanche cycle, trees may temporarily dominate the overstory. Herbaceous seres may be present on sites with very frequent avalanche cycles. Fire does not play an important role in the structure or function of this BpS.

Fire Frequency

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

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

Large patch

Adjacency or Identification Concerns

This system is similar in species composition to the Alaskan Pacific Maritime Subalpine Alder-Salmonberry Shrubland, but it occurs below the subalpine zone and tree growth is limited by avalanche frequency rather than elevation and temperature as in the subalpine system (NatureServe 2008).

Though avalanche slopes can occur from alpine to lower slopes, this model excludes the avalanche slopes above treeline—these would be included in other systems according to vegetation type: Alaskan Pacific Maritime Subalpine Alder-Salmonberry Shrubland, Alaskan Pacific Maritime Alpine Herbaceous Dwarf Shrubland, etc.

Issues or Problems

Native Uncharacteristic Conditions

Comments

This model was developed during LANDFIRE National by Tom DeMeo for the Maritime region of Alaska. Review comments resulted in minor descriptive changes.

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 | B | B | B | B | B | B | B | B | B | B |
| Shrub | 0.5-1.0 | B | B | B | B | B | B | B | B | B | B |
| Shrub | 1.0-3.0 | B | B | B | B | B | B | B | B | B | B |
| Shrub | >3.0 | B | B | B | B | B | B | B | B | B | B |
| Tree | 0-5 | B | B | B | B | B | B | B | B | B | B |
| 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 31 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| CACA4 | *Calamagrostis canadensis* | Bluejoint | Upper |
| CHAN9 | *Chamerion angustifolium* | Fireweed | Upper |
| ATFI | *Athyrium filix-femina* | Common ladyfern | Upper |
| VEVI | *Veratrum viride* | Green false hellebore | Upper |

Description

Forbs, shrubs, and deciduous trees resprout immediately following disturbance, but herbaceous vegetation dominates in early succession. Herbaceous patches are often dominated by *Calamagrostis canadensis* and *Chamerion angustifolium*; other common herbs include *Athyrium filix-femina, Veratrum viride, Heracleum maximum, Streptopus amplexifolius,* and *Aruncus dioicus* (DeVelice et al. 1999; Viereck et al. 1992).

*Maximum Tree Size Class*  
Seedling/Sapling <5"

Class B 69 Late Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ALVIS | *Alnus viridis* ssp*. sinuata* | Sitka alder | Upper |
| RUSP | *Rubus spectabilis* | Salmonberry | Upper |
| SARA2 | *Sambucus racemosa* | Red elderberry | Upper |
| SALIX | *Salix* spp. | Willow | Upper |

Description

Shrubs can become established at the edges or the bottom of the chutes. The dominant shrubs species are typically *Alnus viridis* ssp*. Sinuata* and *Rubus spectabilis*; but other shrubs including *Sambucus racemosa, Salix alaxensis, S. barclayi,* and *Oplopanax horridus* may be common. Tree seedlings and saplings may be common on some slopes but typically do not emerge as an overstory due to frequent avalanches. On sites where avalanche activity is less frequent, trees can occasionally emerge temporarily in the overstory.

*Maximum Tree Size Class*  
Seedling/Sapling <5"

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Late1:ALL | 9 |
| Late1:ALL | 10 | 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** |
| Optional 1 | Early1:ALL | Early1:ALL | 0.04 | 25 | Yes | 0 |
| Optional 1 | Late1:ALL | Early1:ALL | 0.04 | 25 | Yes | 0 |

Optional Disturbances

Optional 1: Avalanche/Mass movement

References

DeVelice, R., C. Hubbard, K. Boggs, S. Boudreau, M. Potkin, T. Boucher, and C. Wertheim. 1999. Plant community types of the Chugach National Forest: Southcentral Alaska. U.S.D.A., Forest Service: Chugach National Forest, Alaska Region, Anchorage, Alaska. Tech. Pub. R10-TP-76. 375 p.

NatureServe. 2008a. International Ecological Classification Standard: Terrestrial Ecological Classifications. Draft Ecological Systems Description for Alaska Boreal and Sub-boreal Regions.

NatureServe. 2008b. International Ecological Classification Standard: Terrestrial Ecological Classifications. Draft Ecological Systems Description for the Alaska Maritime Region.

Viereck et al. 1992. The Alaska vegetation classification. Pacific Northwest Research Station, USDA Forest Service, Portland, OR. Gen. Tech. Rep. PNW-GTR286. 278 p.