

LANDFIRE Biophysical Setting Model

Biophysical Setting 7716800

Alaskan Pacific Maritime Avalanche Slope Shrubland

- ☐ This BPS is lumped with:
☐ This BPS is split into multiple models:

General Information

Contributors (also see the Comments field)

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Vegetation Type

Upland Shrubland

Map Zone

77

Model Zone

- | | |
|--|--|
| ☒ Alaska | ☐ N-Cent.Rockies |
| ☐ California | ☐ Pacific Northwest |
| ☐ Great Basin | ☐ South Central |
| ☐ Great Lakes | ☐ Southeast |
| ☐ Northeast | ☐ S. Appalachians |
| ☐ Northern Plains | ☐ Southwest |

Dominant Species*

ALVIS OPHO
RUSP CACA4
SARA2 CHAN9
SALIX ATFI

General Model Sources

- ☒ Literature
☐ Local Data
☒ Expert Estimate

Geographic Range

This system 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, 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*, and *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* meadows. Tree seedlings and saplings may be abundant on some slopes but do not emerge as an overstory due to frequent disturbance.

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,

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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.

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.

Native Uncharacteristic Conditions

Scale Description

Large patch

Issues/Problems

Comments

This model was developed by Tom DeMeo for the maritime region of AK. Review comments resulted in minor descriptive changes.

Vegetation Classes

Class A 30 %

Early Development 1 All Structures

Upper Layer Lifeform

- ☒ Herbaceous
☐ Shrub
☐ Tree

Indicator Species* and

Canopy Position

CACA4 Upper
 CHAN9 Upper
 ATFI Upper
 VEVI Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	Herbaceous	Herbaceous
Height	Herbaceous	Herbaceous
Tree Size Class	Seedling/Sapling <5"	

☐ Upper layer lifeform differs from dominant lifeform.

Description

0-9yrs

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).

Succession to class B. Avalanche (probability = 0.04; represented as Option 1 in the model) resets the age of this class.

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Class B 70 %

Late Development 1 All Structures

Upper Layer Lifeform

- ☐ Herbaceous
☒ Shrub
☐ Tree

Indicator Species* and Canopy Position

ALVIS Upper
RUSP Upper
SARA2 Upper
SALIX Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	Open Shrub (25-74% shrub cover)	Closed Shrub (> 75% shrub cover)
Height	Dwarf Shrub (< 20 cm)	Tall Shrub (>1.5 m)
Tree Size Class	Seedling/Sapling <5"	

☐ Upper layer lifeform differs from dominant lifeform.

Description

10yrs+

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.

This class persists in the absence of disturbance. Avalanche (probability = 0.04; represented as Option 1 in the model) causes a transition to class A.

Class C 0 %

[Not Used] [Not Used]

Upper Layer Lifeform

- ☐ Herbaceous
☐ Shrub
☐ Tree

Indicator Species* and Canopy Position**Structure Data (for upper layer lifeform)**

	Min	Max
Cover		
Height		
Tree Size Class		

☐ Upper layer lifeform differs from dominant lifeform.

Description**Class D 0 %**

[Not Used] [Not Used]

Upper Layer Lifeform

- ☐ Herbaceous
☐ Shrub
☐ Tree

Indicator Species* and Canopy Position**Structure Data (for upper layer lifeform)**

	Min	Max
Cover		
Height		
Tree Size Class		

☐ Upper layer lifeform differs from dominant lifeform.

Description

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Class E **0%**

[Not Used] [Not Used]

Upper Layer Lifeform

- ☐ Herbaceous
☐ Shrub
☐ Tree

**Indicator Species* and
Canopy Position**

Structure Data (for upper layer lifeform)

	Min	Max
Cover		
Height		
Tree Size Class		

- ☐ Upper layer lifeform differs from dominant lifeform.

Description

Disturbances

Fire Regime Group:** **NA**

Historical Fire Size (acres)

Avg 0
Min 0
Max 0

Sources of Fire Regime Data

- ☐ Literature
☐ Local Data
☒ Expert Estimate

Fire Intervals

Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement				
Mixed				
Surface				
All Fires				

Fire Intervals (FI):

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inverse of fire interval in years and is used in reference condition modeling. Percent of all fires is the percent of all fires in that severity class.

Additional Disturbances Modeled

- ☐ Insects/Disease ☐ Native Grazing ☒ Other (optional 1) Avalanche/Mass movement
☐ Wind/Weather/Stress ☐ Competition ☐ Other (optional 2)

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.

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