16430

Alaskan Pacific Alpine-Subalpine Dwarf-shrubland and Heath

BpS Model/Description Version: Nov. 2024

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

Vegetation Type

Shrubland

Map Zones

73, 74, 75, 76, 77, 78

Geographic Range

This Biophysical Setting (BpS) occurs from the Alaska Range and Prince William Sound south and east through southeastern Alaska.

Biophysical Site Description

This system occurs on a variety of sites in the alpine and subalpine zones of southeastern, maritime Alaska, but it can also be found at lower elevations (e.g., Kenai Fjords and Prince William Sound). It occurs on sideslopes, shoulder slopes, low summits, exposed summits, windswept ridges, and fell-fields, and the terrain varies from flat to gently sloping to steep. Environmental conditions are often harsh, particularly on exposed summits and ridge tops where vegetation may be sparse with a high proportion of exposed rock or soil. Much of the alpine zone will be under snow for most of the year leading to a short growing season.

Vegetation Description

This BpS represents several existing vegetation types, so species composition is highly variable.

The vegetation can be a mosaic of herbaceous meadow and alpine heath (dwarf-shrublands) or herbaceous meadow with a heath understory; however, in some areas dwarf-shrub cover is continuous. In areas with harsh environmental conditions, vegetation cover is sparse, ranging from 10 to 25%. Dominant dwarf-shrub species include *Empetrum nigrum, Phyllodoce aleutica, Phyllodoce glanduliflora, Cassiope mertensiana, Cassiope tetragona, Harrimanella stelleriana*, and *Luetkea pectinata*. Other common species may include *Artemisia arctica, Sibbaldia procumbens, Vaccinium uliginosum, Vaccinium vitis-idaea*, and *Loiseleuria procumbens*. Ericaceous species typically dominate this type, but sites dominated by *Salix arctica,* *Salix reticulata*, and *Salix rotundifolia* are included in this system. Scattered tall shrubs and dwarf trees may be present. Common herbaceous species include *Aconitum delphiniifolium, Anemone narcissiflora, Astragalus alpinus, Athyrium filix-femina, Carex macrochaeta, Castilleja unalaschcensis, Chamerion angustifolium, Chamerion latifolium, Calamagrostis canadensis, Geranium erianthum, Lupinus nootkatensis, Minuartia arctica, Saxifraga bracteata, Saxifraga bronchialis, Silene acaulis, Sanguisorba canadensis, Senecio triangularis, Valeriana sitchensis, Veratrum viride* and *Viola* spp. On slopes on the outer coast and also in Kenai Fjords and Prince William Sound, *Nephrophyllidium crista-galli* is common. Lichens may be common.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| EMNI | *Empetrum nigrum* | Black crowberry |
| PHAL4 | *Phyllodoce aleutica* | Aleutian mountainheath |
| HAST3 | *Harrimanella stelleriana* | Alaska bellheather |
| ARAR9 | *Artemisia arctica* | Boreal sagebrush |
| CAMA11 | *Carex macrochaeta* | Longawn sedge |
| LUNO | *Lupinus nootkatensis* | Nootka lupine |
| VASI | *Valeriana sitchensis* | Sitka valerian |
| GEER2 | *Geranium erianthum* | Woolly geranium |

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

Disturbance Description

These communities tend to be quite stable over time. Soil disturbance, such as soil creep or freeze-thaw cycles, is likely the main disturbance factor although snow avalanche is possible in some areas. Wind plays a role in inhibiting vegetation growth on exposed summits and ridge tops. Reduced snow levels could allow invasion of other plants and lead to succession to another system. This type is unlikely to carry fire.

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

Small patch, Large patch

Adjacency or Identification Concerns

Issues or Problems

It is unclear whether there is a successional relationship between herbs and shrubs in some alpine types or whether soil differences result in the prevalence of different life forms on different sites. Because of the uncertainty, this system is represented by a single seral stage.

Native Uncharacteristic Conditions

Comments

In 2021 NatureServe merged Alaskan Pacific Maritime Alpine Dwarf-Shrubland (BpS 1643) and Alaskan Pacific Maritime Alpine Sparse Shrub and Fell-Field (BpS 1674) into one Ecological System: Alaskan Pacific Alpine-Subalpine Dwarf-shrubland and Heath. These BpS were previously lumped for modeling, but Kori Blankenship worked with NatureServe staff to update the description to reflect the new Ecological System concept.

During LANDFIRE National this model was based on the draft Maritime Ecological Systems description with input from Tom DeMeo.

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 | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 5-10 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 10-25 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | >50 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |

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 100 Mid Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| EMNI | *Empetrum nigrum* | Black crowberry | Upper |
| PHAL4 | *Phyllodoce aleutica* | Aleutian mountainheath | Upper |
| CAMA11 | *Carex macrochaeta* | Longawn sedge | Upper |
| LUNO | *Lupinus nootkatensis* | Nootka lupine | Upper |

Description

Alpine dwarf shrub and heath communities may include a diverse mix of species and species assemblages. The Class Indicator Species listed are not true indicators -- refer to the Vegetation Description for species information.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Mid1:ALL | 0 | Mid1: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** |

References

Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, M. Russo, K. Schulz, K. Snow, J. Teague, and R. White. 2003-present. Ecological systems of the United States: A working classification of U.S. terrestrial systems. NatureServe, Arlington, VA.