16351

Western North American Boreal Alpine Dwarf-shrubland

Model Date: 04/16/08 Report Date: 9/11/15

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| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
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| Tina Boucher | antvb@uaa.alaska.edu | None | None |
| None | None | None | None |

Reviewer: Robin Innes

Vegetation Type

Upland Shrubland

Map Zones

69, 70, 71, 72, 73, 74, 75

Geographic Range

This system is found in the alpine and subalpine areas of the boreal and sub-boreal regions of AK. To the southwest, the range includes the Ahklun Mts and to the west it extends to the Nulato hills (Ecoregions 9 and 7, Nowacki et al. 2001).

Biophysical Site Description

This BpS includes a mosaic of different vegetation types that are commonly found on alpine and subalpine sites. It occurs on exposed, windswept summits and ridges as well as valleys and on sideslopes. Soils are thin, stony, and well drained to excessively well-drained.

Vegetation Description

This type eoncompasses a wide range of species and plant communities. Common shrubs include Dryas spp. (e.g. Dryas integrifolia and/or Dryas octopetala), Vaccinium uliginosum, Empetrum nigrum, Vaccinium vitis-idaea, V. uliginosum, Diapensia lapponica, Loiseuria procumbens, dwarf Salix spp. (e.g. Salix arctica, S. rotundifolia and S. reticulata), Arctostaphylos spp., Cassiope tetragona (more common north of the Alaska Range), and Harrimanella stellariana (more common south of the Alaska Range). Other shrubs that may be common include Betula nana, Ledum palustre ssp. decumbens, and Oxytropis nigrescens.

Common herbaceous species include Hierochloe alpine, Arnica lessingii, Carex bigelowii, C. microchaeta, Senecio lugens, Minuartia arctica, Anemone parviflora, Ligusticum mutellinoides ssp. alpinum, Castilleja elegans, Poa arctica, Trisetum spicatum, Silene acaulis, Saxifraga spp., Campanula lasiocarpa, Anemone parviflora, Senecio lugens, Polygonum bistorta, Festuca spp. and Luzula spp.

Common lichens include Cetraria, Cladonia rangiferina, C. cucullata, C. stellaris, Stereocaulon spp., Alectoria nigricans, and Thamnolia vermiculata. Mosses such as Aulacomnium palustre, Hylocomium splendens, Pleurozium schreberi, and Polytrichum and Rhacomitrium spp. may be common.

Canopy cover can be sparse due to extreme exposure, and exposed rock and lichens can be abundant.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| CATE11 | Cassiope tetragona | White arctic mountain heather |
| EMNI | Empetrum nigrum | Black crowberry |
| VAUL | Vaccinium uliginosum | Bog blueberry |
| HAST3 | Harrimanella stelleriana | Alaska bellheather |
| ARCTO3 | Arctostaphylos | Manzanita |
| DRIN4 | Dryas integrifolia | Entireleaf mountain-avens |
| DROC | Dryas octopetala | Eightpetal mountain-avens |
| LEPAD | Ledum palustre ssp. decumbens | Marsh labrador tea |
| LOPR | Loiseleuria procumbens | Alpine azalea |

Disturbance Description

Alpine shrub systems likely represent a relatively stable topopoedaphic climax, but little is known about their successional dynamics (Viereck et al. 1992). Vegetation in these areas is controlled by the alpine environment, wind desiccation, and short growing season.

In 2013 an extensive search was done by FEIS staff to locate information for a synthesis on Fire regimes of Alaskan tundra communities (Innes 2013). It is possible that fires caused by lightning strikes could affect small patches of vegetation, but little is known about the frequency, severity or seasonality of fires in this BpS. Lightning strikes in subalpine forest could spread to adjacent alpine tundra communities (Innes 2013). Fire spread was likely limited due to the sparse cover of fine fuels and barren areas acting as fire breaks.

Fire Frequency

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

Scale Description

Vegetation can be found in small or large patches. Fires are typically quite small, and their spread is inhibited by lack of fuel continuity.

Non-Fire Disturbances

Wind/Weather/Stress

Adjacency or Identification Concerns

Adjacent systems include Western North American Boreal Alpine Mesic Herbaceous Meadow, Alaska Sub-boreal and Maritime Alpine Mesic Herbaceous Meadow, or barren alpine classes (including talus or bedrock).

Issues or Problems

Native Uncharacteristic Conditions

Comments

In 2021 NatureServe merged Western North American Boreal Alpine Dwarf-Shrub Summit (BpS 16310), Western North American Boreal Alpine Dryas Dwarf-Shrubland (BpS 16340), Western North American Boreal Alpine Ericaceous Dwarf-Shrubland (16350), Western North American Boreal Alpine Dwarf-Shrub-Lichen Shrubland (16360) into one system called Western North American Boreal Alpine Dwarf-shrubland. Kori Blankenship revised this description accordingly.

For LANDFIRE National this model was created by Kori Blankenship in consultation with Tina Boucher for the boreal region of AK and did not receive review for other parts of the state.

**Model Parameters**

*Using Track Changes in Word you may suggest changes to any of the parameters indicated in the following tables. If you wish to see how those changes impact model results, go to the “Simulation Model Review Instructions” section on* <http://www.landfirereview.org/models.html>*. If you do not wish to edit and run the actual model, the TNC LANDFIRE will do so and if requested provide the reviewer with the results.*

**Deterministic Transitions**

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Early1: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** |
| Wind/Weather/Stress | Early1:ALL | Early1:ALL | 1.0000 | 1 | No | 0 |

Succession Classes

Class A 100 Early Development 1 - All Structures

Structural Information

Tree Size Class: None

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| CATE11 | Cassiope tetragona | White arctic mountain heather | Upper |
| EMNI | Empetrum nigrum | Black crowberry | Upper |
| VAUL | Vaccinium uliginosum | Bog blueberry | Upper |
| DRIN4 | Dryas integrifolia | Entireleaf mountain-avens | Upper |

Description

Sparse, open or closed dwarf shrubs dominate. Exposed rock and lichens can be abundant.

This BpS is relatively stable over time. Continual wind disturbance maintains this BpS.

References

Boggs, K., A. Garibaldi, J. Stevens, J. Grunblatt, and T. Helt. 2001. Denali National Park and Preserve Landcover mapping project. Volume 2: Landcover classes and plant associations. Alaska Natural Heritage Program, Environment and Natural Resources Institute, University of Alaska Anchorage, 707 A Street, Anchorage, AK. 164 p.

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