16380

Alaska Arctic Mesic Alder Shrubland

BpS Model/Description Version: Nov. 2024

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Vegetation Type

Shrubland

Map Zones

67, 68, 69, 70, 71, 72, 73, 76

Geographic Range

This Biophysical Setting (BpS) occurs throughout arctic AK, from the Bristol Bay lowlands in southwestern AK to the North Slope on the Arctic Ocean. It is more common in western AK than on the North Slope. In MZ76 this type is found in Nowacki ecoregions 8, 9 and 10.

Biophysical Site Description

This system is widespread but uncommon, found on mountain and hill slopes and small steep streams (but not floodplains) throughout arctic AK (Boggs et al. 2008). Soils are mesic but sometimes wet if found adjacent to a small stream (Boggs et al. 2008).

Vegetation Description

*Alnus viridis* ssp*. crispa* is the dominant shrub species but may codominate with *Salix glauca* and *Salix pulchra*. Additional species include *Vaccinium uliginosum, Vaccinium vitis-idaea, Betula nana, Ledum palustre* ssp. *decumbens, Empetrum nigrum, Equisetum* spp., *Spiraea stevenii*, *Dryas* spp., and *Cassiope tetragona*. Mosses include *Hylocomium splendens* and *Dicranum* spp. Low-shrub tundra and dwarf-shrubs are common in the gaps between alder patches.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| ALVIC | *Alnus viridis ssp. crispa* | Mountain alder |
| SAGL | *Salix glauca* | Grayleaf willow |
| SAPU15 | *Salix pulchra* | Tealeaf willow |
| VAUL | *Vaccinium uliginosum* | Bog blueberry |
| VAVI | *Vaccinium vitis-idaea* | Lingonberry |
| BENA | *Betula nana* | Dwarf birch |
| LEPAD | *Ledum palustre ssp. decumbens* | Marsh labrador tea |
| EMNI | *Empetrum nigrum* | Black crowberry |

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

Disturbance Description

This system may or may not be controlled by avalanche activity and unstable slopes.

There are few published studies about fire regimes in this BpS (Innes 2015). Alders and willows are generally top-killed by fire but may resprout following fire (Viereck and Schandelmeier 1980). Alder and willow stands can act as a firebreak but are known to burn under severe fire weather. The fire-return interval is likely long. Burns are more common on the Seward Peninsula and other parts of western AK near the spruce forest boundary where fire likely comes into alder from adjacent vegetation types. Early-season fire prior to green-up would be more likely to carry than late-season fire. Insect defoliators and cankers also affect alder.

Alder invades disturbed sites and also spreads into undisturbed sites adjacent to existing patches. After establishing in the uplands, it may be stable for long periods.

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

Adjacency or Identification Concerns

Issues or Problems

Native Uncharacteristic Conditions

Alder appears to be moving upwards on stable toe-slopes and increasing in cover in the Arctic. For further discussion on contemporary changes in this BpS see Innes 2015.

Comments

In 2015 an extensive search was done by Fire Effects Information System staff to locate information for a synthesis on [fire regimes of Alaskan alder and willow shrublands (Innes 2015).](https://www.fs.fed.us/database/feis/fire_regimes/AK_alder_shrub/all.html) At that time, the scientific literature about fire regimes in Alaskan alder and willow shrublands was scarce. Descriptions of fire ignition, season, pattern, and size specific to alder and willow shrublands were not found in the literature.

During LANDFIRE National this system was created for the AK Arctic region and did not receive review for other regions in the state. This model was created by Kori Blankenship and Keith Boggs based input from experts who attended the LANDFIRE Arctic Modeling Meeting (April 2008) and the draft Arctic Ecological Systems description (Boggs et al. 2008).

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** |
| ALVIC | *Alnus viridis* ssp*. crispa* | Mountain alder | Upper |
| SAGL | *Salix glauca* | Grayleaf willow | Upper |
| SAPU15 | *Salix pulchra* | Tealeaf willow | Upper |

Description

This class represents the Mesic Alder Shrubland BpS. See Vegetation Description for more information on species composition.

*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

Boggs et al. 2008. International Ecological Classification Standard: Terrestrial Ecological Classifications. Draft Ecological Systems Description for the Alaska Arctic Region.

Innes, Robin J. 2015. Fire regimes of Alaskan alder and willow shrublands. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Missoula Fire Sciences Laboratory (Producer). Available: https://www.fs.fed.us/database/feis/fire\_regimes/AK\_alder\_shrub/all.html [ 2021, May 13].

Viereck, Leslie A.; Schandelmeier, Linda A. 1980. Effects of fire in Alaska and adjacent Canada: a literature review. BLM-Alaska Tech. Rep. 6, BLM/AK/TR-80/06. Anchorage, AK: U.S. Department of the Interior, Bureau of Land Management, Alaska State Office. 124 p