16990

North American Arctic Mesic Herbaceous Meadow

BpS Model/Description Version: Nov. 2024

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| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
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Vegetation Type

Herbaceous

Map Zones

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

Geographic Range

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

Biophysical Site Description

Mesic herbaceous systems are found on hill and mountain slopes, upper drainages and lowlands including drained lake basins.

Vegetation Description

Species include *Carex microchaeta* ssp. *nesophila* (dominant sedge in higher elevations), *Alopecurus alpinus, Artemisia arctica, Polygonum bistorta, Valeriana capitata, Pedicularis* spp., *Polemonium acutiflorum, Salix rotundifolia,* and *Salix reticulata* (Boggs et al. 2008). Collapsed acidic lowland snowbeds that support *Phippsia algida* and *Alopecurus alpinus*, and drained lake basins dominated by *Calamagrostis canadensis* (western AK) are also included in this system (Boggs et al. 2008).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| CAMIN | *Carex microchaeta ssp. nesophila* | Bering sea sedge |
| ALAL2 | *Alopecurus alpinus* | Boreal alopecurus |
| ARAR9 | *Artemisia arctica* | Boreal sagebrush |
| POBI5 | *Polygonum bistorta* | Meadow bistort |
| VACA3 | *Valeriana capitata* | Captiate valerian |
| PEDIC | *Pedicularis spp.* | Lousewort |
| POAC | *Polemonium acutiflorum* | Tall jacob's-ladder |

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

Disturbance Description

Expert input at the Arctic Modeling meeting (April 08) indicated that this system is quite stable and rarely burns.

In 2015, an extensive literature search was done by Fire Effects Information System staff to locate information for a synthesis on fire regimes of Alaskan wet and mesic herbaceous systems (Innes 2015). This synthesis noted that mesic herbaceous communities can support fire spread during severe weather, and fire usually burns into mesic herbaceous communities from adjacent, more fire-prone ecosystems. Information on fire in wet and mesic meadow types, including Alaska Arctic Mesic Herbaceous Meadows, was sparse to lacking as of 2015.

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

This BpS may occur adjacent to most other BpS in arctic AK.

Issues or Problems

Fire history studies in Alaskan wet and mesic herbaceous systems are limited (Innes 2015).

Native Uncharacteristic Conditions

Innes 2015 includes a discussion of contemporary changes in Alaskan wet and mesic herbaceous systems.

Comments

For 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 | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | 0.5-1.0 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | 1.0-3.0 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | >3.0 | A | A | UN | UN | UN | UN | UN | UN | UN | UN |
| 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** |
| CAMIN | *Carex microchaeta* ssp*. nesophila* | Bering sea sedge | Upper |
| ALAL2 | *Alopecurus alpinus* | Boreal alopecurus | Upper |
| ARAR9 | *Artemisia arctica* | Boreal sagebrush | Upper |
| POBI5 | *Polygonum bistorta* | Meadow bistort | Upper |

Description

This class represents the relatively stable Mesic Herbaceous Meadow community.

*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 wet and mesic herbaceous systems. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Missoula Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/fire\_regimes/AK\_wet\_herbaceous/all.html [2016, August 2].