16330

Western North American Boreal Alpine Mesic Herbaceous Meadow

Model Date: 04/24/08 Report Date: 9/11/15

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| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
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| None | None | None | None |

Reviewer: Robin Innes

Vegetation Type

Upland Grassland/Herbaceous

Map Zones

69, 70, 71, 73, 74

Geographic Range

This system occurs on gentle slopes in subalpine and lower alpine environments throughout boreal AK (NatureServe 2008).

Biophysical Site Description

This system occurs on alpine and subalpine slopes. It tends to occur in small patches in a matrix with dwarf or low shrub systems. Soils are moist to mesic.

Vegetation Description

Carex bigelowii is the dominant species. Other common species may include Luzula confusa and lichens. Dwarf shrubs such as Arctostaphylos alpina, Empetrum nigrum, Salix pulchra, and Betula nana are usually present, but contribute less than 25% to the canopy cover (NatureServe 2008, Boggs and Sturdy 2005).. Wetter sites may include more sedges and Salix spp. This system may form a mosaic with dwarf and low shrub systems.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| CABI5 | Carex bigelowii | Bigelow's sedge |
| BENA | Betula nana | Dwarf birch |
| ARAL2 | Arctostaphylos alpina | Alpine bearberry |
| EMNI | Empetrum nigrum | Black crowberry |

Disturbance Description

Little is known about the disturbance regime of this system. It tends to occur adjacent to low shrub and alpine tundra systems, and even in a patchy mosaic with dwarf and low shrub systems. Because these adjacent systems burn, it is likely that some fire will carry through the Alpine Mesic Herbaceous Meadow system, especially in drier periods. Fire frequency is likely to depend on the adjacent vegetation. For this model, the fire return interval was estimated at twice that of the adjacent Western North American Boreal Mesic Scrub Birch-Willow Shrubland - Boreal BpS (16101).

Little is known about post-fire dynamics, but Carex bigelowii is expected to maintain its dominance. Dwarf shrubs are likely to resprout or establish gradually over time, but will remain a minor component of the system.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Min FI** | **Max FI** | **Percent of All Fires** |
| Replacement | 400 |  |  | 100 |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| **All Fires** | **400** |  |  | **100** |

Scale Description

Small to large patch

Non-Fire Disturbances

Adjacency or Identification Concerns

There is no species overlap between boreal and Sub-boreal herbaceous alpine meadow types. Slope position may also be different: Carex macrochaeta types usually occur just above subalpine alder on straight or concave slopes.

This system often occurs in a patchy mosaic with low and dwarf shrub types (Betula nana and ericaceous dwarf shrub types).

Issues or Problems

Native Uncharacteristic Conditions

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 wet and mesic herbaceous systems (Innes 2015). No published information was found on mesic herbaceous meadows in the boreal alpine and subalpine zones.

During LANDFIRE National this model was created for the boreal region of AK and did not receive review for other parts of the state. Because no data are available about the dynamics of this fairly minor system, this model was based on best estimates, considering vegetation and site characteristics and the dynamics of adjacent vegetation types.

Page Spencer is a suggested reviewer for this system.

**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** |
| ReplacementFire | Early1:ALL | Early1:ALL | 0.0025 | 400 | 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** |
| CABI5 | Carex bigelowii | Bigelow's sedge | Upper |
| BENA | Betula nana | Dwarf birch | Upper |
| ARAL2 | Arctostaphylos alpina | Alpine bearberry | Upper |
| EMNI | Empetrum nigrum | Black crowberry | Upper |

Description

Mesic herbaceous.

In interior Alaska, Carex bigelowii is the dominant species. Other herbaceous species, including Luzula confusa, are frequently present, along with a well-developed lichen layer. Dwarf shrubs such as Arctostaphylos alpina, Empetrum nigrum, and Betula nana are present, but contribute less than 25% to the canopy cover (Boggs and Sturdy 2005).

Although this system tends to be fairly moist, litter accumulation will provide enough fuel to carry a fire during dry periods.

This BpS is relatively stable over time.

References

Boggs, K. and Sturdy, M. 2005. Plant associations and post-fire vegetation succession in Yukon-Charley Rivers National Preserve. Alaska Natural Heritage Program, Environment and Natural Resources Institute, University of Alaska Anchorage. Prepared For: National Park Service, Landcover Mapping Program, National Park Service-Alaska Support Office, Anchorage, Alaska 99501.

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 pp.

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].

NatureServe. 2008. International Ecological Classification Standard: Terrestrial Ecological Classifications. Draft Ecological Systems Description for Alaska Boreal and Sub-boreal Regions.