

# LANDFIRE Biophysical Setting Model

**Biophysical Setting 7216980**

**Alaska Arctic Wet Sedge Meadow**

☐ This BPS is lumped with:

☐ This BPS is split into multiple models:

## General Information

**Contributors** (also see the Comments field) **Date** 10/9/2008

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**Modeler 2** Keith Boggs Ankwb@uaa.alaska.edu **Reviewer**

**Modeler 3** **Reviewer**

### Vegetation Type

Wetlands/Riparian

### Map Zone

72

### Model Zone

- |                                            |                                            |
|--------------------------------------------|--------------------------------------------|
| <input checked="" type="checkbox"/> Alaska | <input type="checkbox"/> N-Cent.Rockies    |
| <input type="checkbox"/> California        | <input type="checkbox"/> Pacific Northwest |
| <input type="checkbox"/> Great Basin       | <input type="checkbox"/> South Central     |
| <input type="checkbox"/> Great Lakes       | <input type="checkbox"/> Southeast         |
| <input type="checkbox"/> Northeast         | <input type="checkbox"/> S. Appalachians   |
| <input type="checkbox"/> Northern Plains   | <input type="checkbox"/> Southwest         |

### Dominant Species\*

CAAQ CARA5  
ERAN6 CACH5  
CAGL4 ERSC2  
CARO7 ERRU2

### General Model Sources

- ☐ Literature  
☐ Local Data  
☒ Expert Estimate

## Geographic Range

This BpS occurs throughout arctic AK, from the Bristol Bay lowlands in southwestern AK to the North Slope on the Arctic Ocean. It is common in arctic lowlands and may be found as small patches in alpine areas (Viereck et al. 1992, III.A.3.a).

## Biophysical Site Description

This system occurs on wet sites (typically with 0-19% visible surface water) with >25% cover of sedge species (Boggs et al. 2008). Sites are flat to sloping in valley bottoms, basins, water tracks and adjacent to streams (Boggs et al. 2008). This system also includes patterned wetlands such as ribbed fens. Soils range from acidic to non-acidic, are saturated during the summer and have an organic horizon over silt with permafrost (Boggs et al. 2008).

## Vegetation Description

The following information was taken from the draft Arctic Ecological Systems description with slight modifications (Boggs et al. 2008):

This system has >25% cover of sedge species. Species diversity is much higher than in the freshwater marsh systems. Sites are typically dominated by *Carex aquatilis* and *Eriophorum angustifolium*, but may also be dominated or co-dominated by *Carex glareosa*, *C. rotundata*, *C. rariflora*, *C. chordorrhiza*, *C. rostrata*, *C. saxatilis*, *C. utriculata*, *Eriophorum russeolum*, *E. scheuchzeri* and *Dupontia fisheri*. Dwarf shrubs such as *Salix fuscescens*, *S. pulchra*, *Andromeda polifolia*, *Betula nana*, *Empetrum nigrum*, *Ledum palustre* ssp. *decumbens* and *Vaccinium uliginosum* may be common, but make up <25% cover. Moss species include *Drepanocladus* spp. and *Sphagnum* spp.

## Disturbance Description

This system occurs within a variety of successional processes, including thaw lakes, strangmoors, ice-

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\*\*Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100-year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement severity

wedge polygons, oriented lakes, water tracks and adjacent to streams (Boggs et al. 2008). The successional processes of this system are likely too slow (i.e. on the scale of 1000s of years) to be captured using the LANDFIRE methodology and the seral stages are unclear (personal communication Arctic modeling meeting April 2008); however, a study by Racine et al. (2004) on the Seward Peninsula found that cover of *Carex aquatilis* recovered to near pre-burn levels within three years after a 1977 fire.

The following information was taken from the draft Arctic Ecological Systems description with minor modifications (Boggs et al. 2008):

This can be an early-seral stage in the thaw pond cycle which starts with the collapse of a permafrost plateau resulting in a wet depression often with open water. This is colonized by marsh species or Sphagnum species or a combination of both. Sedges eventually invade, and the wet sedge-Sphagnum system develops. If organic matter buildup or permafrost uplift the surface, then this system may be seral to the dwarf-shrub-Sphagnum system. This system, in turn, may be seral to the permafrost plateau-dwarf-shrub-lichen system. The seral sequence may not be unidirectional, and the timeframe is unclear, possibly taking hundreds of years.

## Adjacency or Identification Concerns

## Native Uncharacteristic Conditions

## Scale Description

Patch size is small to moderate, and may be linear.

## Issues/Problems

## Comments

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).

## Vegetation Classes

### Class A 100 %

Mid Development 1 All Structures

#### Upper Layer Lifeform

- ☒ Herbaceous  
☐ Shrub  
☐ Tree

#### Indicator Species\* and Canopy Position

CAAQ Upper  
 ERAN6 Upper  
 CAREX Upper

#### Structure Data (for upper layer lifeform)

|                 | Min        | Max        |
|-----------------|------------|------------|
| Cover           | Herbaceous | Herbaceous |
| Height          | Herbaceous | Herbaceous |
| Tree Size Class | None       |            |

☐ Upper layer lifeform differs from dominant lifeform.

#### Description

Zero plus years

This class represents the Wet Sedge Meadow system. Refer to the vegetation description for common species.

No disturbances modeled.

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**Class B 0 %**

[Not Used] [Not Used]

**Upper Layer Lifeform**

- ☐ Herbaceous  
☐ Shrub  
☐ Tree

**Indicator Species\* and Canopy Position****Structure Data (for upper layer lifeform)**

|                 | Min | Max |
|-----------------|-----|-----|
| Cover           |     |     |
| Height          |     |     |
| Tree Size Class |     |     |

☐ Upper layer lifeform differs from dominant lifeform.**Description****Class C 0 %**

[Not Used] [Not Used]

**Upper Layer Lifeform**

- ☐ Herbaceous  
☐ Shrub  
☐ Tree

**Indicator Species\* and Canopy Position****Structure Data (for upper layer lifeform)**

|                 | Min | Max |
|-----------------|-----|-----|
| Cover           |     |     |
| Height          |     |     |
| Tree Size Class |     |     |

☐ Upper layer lifeform differs from dominant lifeform.**Description****Class D 0 %**

[Not Used] [Not Used]

**Upper Layer Lifeform**

- ☐ Herbaceous  
☐ Shrub  
☐ Tree

**Indicator Species\* and Canopy Position****Structure Data (for upper layer lifeform)**

|                 | Min | Max |
|-----------------|-----|-----|
| Cover           |     |     |
| Height          |     |     |
| Tree Size Class |     |     |

☐ Upper layer lifeform differs from dominant lifeform.**Description****Class E 0 %**

[Not Used] [Not Used]

**Upper Layer Lifeform**

- ☐ Herbaceous  
☐ Shrub  
☐ Tree

**Indicator Species\* and Canopy Position****Structure Data (for upper layer lifeform)**

|                 | Min | Max |
|-----------------|-----|-----|
| Cover           |     |     |
| Height          |     |     |
| Tree Size Class |     |     |

☐ Upper layer lifeform differs from dominant lifeform.**Description****Disturbances**

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**Fire Regime Group\*\*:** NA

**Historical Fire Size (acres)**

Avg 0

Min 0

Max 0

**Sources of Fire Regime Data**

- ☐ Literature  
☐ Local Data  
☒ Expert Estimate

**Additional Disturbances Modeled**

- ☐ Insects/Disease    ☐ Native Grazing    ☐ Other (optional 1)  
☐ Wind/Weather/Stress    ☐ Competition    ☐ Other (optional 2)

**Fire Intervals**

|             | Avg FI | Min FI | Max FI | Probability | Percent of All Fires |
|-------------|--------|--------|--------|-------------|----------------------|
| Replacement |        |        |        |             |                      |
| Mixed       |        |        |        |             |                      |
| Surface     |        |        |        |             |                      |
| All Fires   |        |        |        |             |                      |

**Fire Intervals (FI):**

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inverse of fire interval in years and is used in reference condition modeling. Percent of all fires is the percent of all fires in that severity class.

**References**

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

Racine, C., R. Jandt, C. Meyers and J. Dennis. 2004. Tundra fire and vegetation change along a hillslope on the Seward Peninsula, Alaska, U.S.A. Arctic, Antarctic, and Alpine Research. 36(1): 1-10.

Viereck, L.A., C.T. Dyrness, A.R. Batten and K.J. Wenzlick. 1992. The Alaska vegetation classification. Pacific Northwest Research Station, USDA Forest Service, Portland, OR. Gen. Tech. Rep. PNW-GTR286. 278 p.

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