LANDFIRE Biophysical Setting Model

Biophysical Setting 6817060 Alaska Arctic Polygonal Ground Wet Sedge Tundra

☐ *This BPS is lumped with:*
☐ *This BPS is split into multiple models:*

General Information

Contributors (also see the Comments field) **Date** 10/17/2008

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Vegetation Type
Wetlands/Riparian

Map Zone
68

Model Zone
☑ Alaska ☐ N-Cent.Rockies
☐ California ☐ Pacific Northwest
☐ Great Basin ☐ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*

CAAQ	SAPU15
ERAN6	LEPAD
CABI5	VAVI
BENA	VAUL

General Model Sources
☐ Literature
☐ Local Data
☑ Expert Estimate

Geographic Range
This BpS is typically found in the lowland regions of arctic AK, particularly on the Beaufort Coastal Plain ecoregion (Nowacki et al. 2001) in northern AK, and the Kotzebue Sound lowlands of west-central AK, but it also occurs in other scattered locations of arctic AK where ice-wedge processes occur.

Biophysical Site Description
The following information was taken from the draft Arctic Ecological Systems description (Boggs et al. 2008):
Ice-wedge polygons and the thaw lake cycle dominate the Beaufort Coastal Plain ecoregion (Nowacki et al. 2001). The ice-wedge polygons generally occur on level surfaces (0-2 degree slopes), the ice wedges may be 2 m wide at the top, and polygon diameter ranges from several to more than 30 meters. In addition to the Beaufort Coastal Plain, ice-wedge polygons are a common feature on level ground within foothills and mountains, on glacial drift, lacustrine and floodplain terrace surficial deposits. The Polygonal Ground Wet Sedge Tundra system typically occurs on low-center polygons.

Vegetation Description
The following information was taken from the draft Arctic Ecological Systems description (Boggs et al. 2008):
The polygon centers have standing water, marsh and wet sedge vegetation, primarily Carex aquatilis and Eriophorum angustifolium. The polygon perimeters typically support wet sedge vegetation also dominated by Carex aquatilis and Eriophorum angustifolium. More elevated perimeters support low shrubs and tussocks. Common shrubs include Betula nana, Salix pulchra, Ledum palustre ssp. decumbens, Vaccinium vitis-idaea, Vaccinium uliginosum and Empetrum nigrum. Eriophorum vaginatum is the

*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**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 seve

primary tussock-former in most sites, but Carex bigelowii may dominate some sites. Common mosses include Sphagnum spp., Polytrichum strictum and Hylocomium splendens. Carex aquatilis and Eriophorum angustifolium are the dominant and indicator species for this type; other species make up lass than 10% of the sites.

Disturbance Description

The following paragraph was taken from the draft Arctic Ecological Systems description (Boggs et al. 2008):
Ice wedge polygons are formed by large ice wedges which grow in thermal contraction cracks in permafrost. Low center polygons indicate that ice wedges are actually growing and that sediments are being actively upturned. High center polygons indicate that erosion, deposition, or thawing is more prevalent than the up-pushing of the sediments along the sides of the wedge. Ice-wedge polygons are typically part of a spatially coarser thaw lake cycle.

Peterson and Billings (1978) found that low center polygons evolve into high center polygons on the edge of the Meade River Sand Bluffs (100 km south of Barrow, Alaska).

The time scale on successional processes for this BpS is long and probably beyond the scope of this modeling effort. Therefore, this system is modeled as a stable, 1-class system.

Adjacency or Identification Concerns

Native Uncharacteristic Conditions

Scale Description

Large patch.

Issues/Problems

Comments

This model was created by Kori Blankenship and Keith Boggs based on 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

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.

Dwarf or low shrubs may be present but will not dominate.

Description

Zero plus years

This class represents the Polygonal Ground Wet Sedge Tundra system. Refer to the vegetation description for common species.

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No disturbances modeled.

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

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 fir combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inver 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.

Additional Disturbances Modeled

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

References

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

Nowacki, G., P. Spencer, M. Fleming, T. Brock and T. Jorgenson. 2001. Unified ecoregions of Alaska. U.S. Department of the Interior, U.S. Geological Survey. Open file-report 02-297. 2 page map.

Peterson, K.M. and W.D. Billings. 1978. Geomorphic processes and vegetational change along the Meade River sand bluffs in northern Alaska. Arctic. 31(1): 7-23.

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