LANDFIRE Biophysical Setting Model

Biophysical Setting 7016300 Western North American Boreal Wet Black Spruce-Tussock Woodland

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

General Information

Contributors (also see the Comments field **Date** 3/11/2008

Modeler 1	Kori Blankenship	kblankenship@tnc.org	**Reviewer**	Lisa Saperstein	Lisa_Saperstein@fws.gov
Modeler 2	Robert Lambrecht	Robert_Lambrecht@fws.gov	**Reviewer**	Stuart Chapin	fffsc@uaf.edu
Modeler 3			**Reviewer**		

Vegetation Type
Wetlands/Riparian

Map Zone
70

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

Dominant Species*

PIMA	VAVI
BENA	ERVA4
LEPAD	CABI5
VAUL	RUCH

General Model Sources
☑ Literature
☐ Local Data
☑ Expert Estimate

Geographic Range
Boreal Wet Black Spruce-Tussock Woodland is found throughout interior AK from the southern slopes of the Brooks Range to southcentral AK (not including the sub-boreal region) and west to the limit of tree growth (NatureServe 2008).

Biophysical Site Description
This type is found on north-facing slopes, gentle hills, and inactive alluvial surfaces underlain by permafrost (NatureServe 2008). Soils are poorly drained and consist of tussocks over peat or mineral soil (Jorgenson et al. 2001, Boggs and Sturdy 2005).

Vegetation Description
Picea mariana is the dominant tree species and occurs in open stands. Tussock-forming sedges contribute at least 25% of the vegetation cover (NatureServe 2008). Common understory shrubs include Betula nana (including B. glandulosa), Ledum palustre ssp. Decumbens., Vaccinium uliginosum and V. vitis-idaea. Herbaceous species include Eriophorum vaginatum, Carex bigelowii and Rubus chaememorus (NatureServe 2008). Mosses may be abundant and include Sphagnum spp. and Hylocomium splendens (Jorgenson et al. 2001, Boggs and Sturdy 2005).

Disturbance Description
Fire is the primary disturbance in this system. Fire severity is generally sufficient to kill the overstory. Mean fire return interval estimates in boreal AK range from 25-130yrs (Rowe et al.1974, Yarie 1983, Heinselman 1978, Heinselman 1981, Viereck 1983, Viereck 1986).

*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

Under appropriate conditions, this system can originate from a very late seral stage of the Boreal Black Spruce Dwarf-tree Peatland system.

Adjacency or Identification Concerns

This system tends to occur on a continuum between the Boreal Black Spruce Dwarf-tree Peatland system and the Boreal Low Shrub-Tussock Tundra system. Boreal Wet Black Spruce-Tussock Woodland occurs on sites that are slightly higher and drier than tussock-shrub sites and slightly lower and wetter than wet black spruce sites.

The herb and shrub classes of this system are similar in structure and composition to the herb and shrub classes of the Boreal Low Shrub-Tussock Tundra system, but the Boreal Low Shrub-Tussock Tundra system occurs where site conditions prevent trees from invading.

Native Uncharacteristic Conditions

Scale Description

Large patch (Small patch)

Issues/Problems

Comments

This model was based on input from the experts who attended the LANDFIRE Fairbanks (Nov. 07) modeling meeting and refined by Robert Lambrecht. Torre Jorgenson provided some information on the relationships between this system and adjacent systems.

Vegetation Classes

Class A 5%

Early Development 1 All Structures

Upper Layer Lifeform

- ☑ Herbaceous
- ☐ Shrub
- ☐ Tree

Indicator Species* and Canopy Position

ERVA4	Upper
CABI5	Upper
RUCH	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

0-9yrs

This class is characterized by tussock forming sedges. Common species include Eriophorum vaginatum, Carex bigelowii and Rubus chaememorus.

Succession to class B. Replacement MFRI = 150yrs.

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Class B 20 %

Mid Development 1 All Structures

Upper Layer Lifeform

- ☐ Herbaceous
- ☑ Shrub
- ☐ Tree

Indicator Species* and Canopy Position

BENA	Upper
LEPAD	Upper
VAUL	Upper
VAVI	Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	Open Shrub (25-74% shrub cover)	Open Shrub (25-74% shrub cover)
Height	Dwarf Shrub (< 20 cm)	Low Shrub (20 cm to 1.5 m)
Tree Size Class	Seedling/Sapling <5"	

☐ Upper layer lifeform differs from dominant lifeform.

Description

10-49yrs

Shrubs resprout quickly after fire, becoming the dominant, upper-level canopy layer in 10-15yrs. Common species include Betula nana, Ledum palustre ssp. decumbens., Vaccinium uliginosum and V. vitis-idaea.

Succession to class C. Replacement MFRI = 150 yrs.

Class C 75 %

Late Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Indicator Species* and Canopy Position

PIMA	Upper
BENA	Lower
LEPAD	Lower
VAUL	Lower

Structure Data (for upper layer lifeform)

	Min	Max
Cover	Woodland (10-24% tree cover)	Open (25-59% tree cover)
Height	Dwarf Tree (< 3 m)	Tree (> 3m)
Tree Size Class	Pole 5–9" (swd)/5–11" (hwd)	

☐ Upper layer lifeform differs from dominant lifeform.

Description

50yrs+

This class is characterized by mature black spruce tussock forest (spruce cover generally 10-25%; tussock cover >25%). Overstory is dominated by Picea mariana. It is during this class when organic material begins to accumulate and a distinctive “active layer” appears, affecting fire behavior depending upon how dry it gets.

This class can persist in the absence of disturbance. Replacement MFRI = 150yrs. Mixed fire (MFRI = 500yrs) will maintain this class.

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

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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

Fire Regime Group:** **IV**

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	152			0.00658	81
Mixed	667			0.0015	19
Surface					
All Fires	124			0.00809	

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)

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