**Biophysical Setting: 7616050**  Western North American Boreal Mesic Birch-Aspen Forest

<table>
<thead>
<tr>
<th>Contributors (also see the Comments field)</th>
<th>Date</th>
<th>Reviewer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modeler 1 Michelle Schuman</td>
<td>4/16/2008</td>
<td><a href="mailto:wputman@tananachiefs.org">wputman@tananachiefs.org</a></td>
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<td>Modeler 2 Mitch Michaud</td>
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<td>n-cents.rockies.gov</td>
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<tr>
<td>Modeler 3 Kori Blankenship</td>
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<td>s. appalachians.gov</td>
</tr>
</tbody>
</table>

**General Information**

- **Vegetation Type**: Forest and Woodland
- **Dominant Species**: BEPA, POTR5, POBA2, ROAC
- **Map Zone**: 76
- **Model Zone**: Alaska, California, Pacific Northwest, Great Basin, South Central, Great Lakes, Southeast, Northeast, Northern Plains, S. Appalachians, Southwest

**Geographic Range**

Found throughout boreal AK. In MZ76 this type is found in Nowacki ecoregions 8, 9 and 10.

**Biophysical Site Description**

This system occurs on rolling hills and mountain sideslopes on west, east, and south aspects up to 750 m (NatureServe 2008). Soils are well-drained and develop on residual material or retransported deposits including glacial till, loess, and colluvium (NatureServe 2008). Hardwood-dominated sites often persist on slopes that are warmer and drier than white spruce or mixed white spruce hardwood sites, with aspen dominating the driest, warmest sites (Viereck et al. 1992, Chapin et al. 2006).

**Vegetation Description**

Canopy cover is dominated by Betula papyrifera or Populus tremuloides and typically ranges from 25-90%. P. balsamifera may be a common associate. Stands are often closed-canopied with an open shrub or herbaceous understory. Common understory species include Alnus spp., Ledum spp., Vaccinium vitis-idaea, Betula nana, Rosa acicularis, Viburnum edule and Equisetum spp. (NatureServe 2008). Shepherdia canadensis is common on drier sites, especially well-drained riparian gravel bars. Feathermosses such as Hylocomium splendens and Pleurozium schreberi are common in the ground layer (Jorgenson et al. 1999; Boggs and Sturdy, 2005).

**Disturbance Description**

Little research exists on the fire ecology of this type. The system often acts as a fire break. It is estimated

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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.
that the MFRI is longer than that of white and black spruce sites and maybe comparable to Boreal White Spruce-Hardwood Forest system.

**Adjacency or Identification Concerns**
This system can be easily confused with seral stages of two other ecological systems in boreal AK: Western North American Boreal White Spruce-Hardwood Forest and Western North American Boreal White Spruce Forest. Adjacent systems include Boreal White Spruce-Hardwood, Boreal White Spruce Forest or Boreal Mesic Black Spruce Forest.

**Native Uncharacteristic Conditions**
Recent ongoing leaf miner activity has been observed in birch and aspen, but no long-term information on its impact is available.

**Scale Description**
Large patch

**Issues/Problems**
There is uncertainty about whether Boreal Mesic Birch-Aspen Forest is a separate BpS from Boreal White Spruce-Hardwood Forest and Boreal White Spruce Forest. This system may occur only where spruce seed sources are lacking.

**Comments**
This system was created for the AK Boreal region and did not receive review for other regions in the state.

This model was based on input from the experts who attended the LANDFIRE Fairbanks modeling meeting (Nov. 07) and refined by Michelle Schuman, Mitch Michaud and Kori Blankenship with input from Tina Boucher. Boreal Mesic Birch-Aspen Forest is treated as a separate BpS within the Boreal region because experts felt it could be distinguished as occupying different biophysical settings from the Boreal White Spruce Forest and Boreal White Spruce - Hardwood Forest systems. In contrast, the Boreal Mesic Birch-Aspen Forest system was lumped with the Sub-boreal White Spruce-Hardwood Forest system within the Sub-boreal region because experts there felt that they could not distinguish the biophysical settings that these types occur on.

**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.
Herbaceous species dominate, including Chamerion angustifolium ssp angustifolium, Calamagrostis canadensis, Equisetum sylvaticum, E. arvense, Mertensia paniculata and Geocaulon lividum. Shrubs are present but not dominant. Following fire, aspen resprouts and birch appears to invade by seed (Viereck and Schandelmeier 1980)

Succession to class B. Replacement MFRI = 200yrs.

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Class C  15%  Mid Development 1

**Upper Layer Lifeform**
- ❌ Herbaceous
- ❌ Shrub
- ✔️ Tree

**Indicator Species and Canopy Position**
- BEPA: Upper
- POTR5: Upper
- ROAC: Lower
- VIED: Lower

**Description**
15-49yrs

Hardwoods gain dominance over shrubs. This class is characterized by dense stands of sapling and pole sized trees. Betula papyrifera or Populus tremuloides typically dominate but P. balsamifera may be a common associate. Common understory species include Alnus spp., Ledum spp., Vaccinium vitis-idaea, Betula nana, Rosa acicularis, Shepherdia canadensis, and Viburnum edule. This stage tends to be more flammable than the others (personal communication, Joan Foote).

Succession to class D. Replacement MFRI = 150yrs.

Class D  15%  Mid Development 2

**Upper Layer Lifeform**
- ❌ Herbaceous
- ❌ Shrub
- ✔️ Tree

**Indicator Species and Canopy Position**
- BEPA: Upper
- POTR5: Upper
- ROAC: Lower
- VIED: Lower

**Description**
50-99yrs

This stand is characterized by mature hardwood trees with more dead and downed fuels. Betula papyrifera or Populus tremuloides typically dominate but P. balsamifera may be a common associate. Common understory species include Ledum spp., Vaccinium vitis-idaea, Betula nana, Rosa acicularis, Shepherdia canadensis, and Viburnum edule. Feathermosses such as Hylocomium splendens and Pleurozium schreberi are common in the ground layer (Boggs and Sturdy, 2005).

Succession to class E. Replacement MFRI = 200yrs.

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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
Late development I

**Class E**  60%  Late Development I

<table>
<thead>
<tr>
<th>Upper Layer Lifeform</th>
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<tbody>
<tr>
<td>□ Herbaceous</td>
<td></td>
</tr>
<tr>
<td>□ Shrub</td>
<td></td>
</tr>
<tr>
<td>✔ Tree</td>
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</table>

**Description**

100yrs+

Late seral stands are characterized by large hardwood trees. This class captures the old, open birch calamagrostis stands. A mixed-age stand can develop as aspen clones resprout when individual trees die. Betula papyrifera or Populus tremuloides typically dominate but P. balsamifera may be a common associate. Spruce may be present in the canopy, and in the absence of fire, could potentially occupy the site. Common understory species include Alnus spp., Ledum spp., Vaccinium vitis-idaea, Betula nana, Rosa acicularis, Shepherdia canadensis, and Viburnum edule. Feathermosses such as Hylocomium splendens and Pleurozium schreberi are common in the ground layer (Boggs and Sturdy 2005).

This class persists in the absence of disturbance. Replacement MFRI = 200yrs. Mixed fire (MFRI = 300yrs) maintains this class.

**Disturbances**

Fire Regime Group**: IV

<table>
<thead>
<tr>
<th>Historical Fire Size (acres)</th>
<th>Fire Intervals</th>
<th>Min FI</th>
<th>Max FI</th>
<th>Probability</th>
<th>Percent of All Fires</th>
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<tbody>
<tr>
<td>Avg 0</td>
<td>Replacement</td>
<td>190.7</td>
<td>0.00524</td>
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<tr>
<td>Min 0</td>
<td>Mixed</td>
<td>503.5</td>
<td>0.00199</td>
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<tr>
<td>Max 0</td>
<td>All Fires</td>
<td>138</td>
<td>0.00724</td>
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</table>

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**


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