

LANDFIRE Biophysical Setting Model

Biophysical Setting: 7616050

Western North American Boreal Mesic Birch-Aspen Forest

- This BPS is lumped with:
 This BPS is split into multiple models:

General Information

Contributors (also see the Comments field)

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Vegetation Type

Forest and Woodland

Dominant Species

BEPA
POTR5
POBA2
ROAC
VIED
SHCA
ALNUS
LEDUM

Map Zone

76

Model Zone

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

General Model

Sources

- Literature
 Local Data
 Expert Estimate

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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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.

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Class C 15 % Mid Development 1
Closed

Structure Data (for upper layer lifeform)

| | Min | Max |
|-----------------|-----------------------------|-----------------------------|
| Cover | Closed (60-100% tree cover) | Closed (60-100% tree cover) |
| Height | Dwarf Tree (< 3 m) | Tree (> 3 m) |
| Tree Size Class | Pole 5-9" (swd)/5-11" (hwd) | |

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Indicator Species and Canopy Position

BEPA Upper
POTR5 Upper
ROAC Lower
VIED Lower

- Upper layer lifeform differs from dominant lifeform.
- For mapping purposes if classes C and D can't be distinguished based on structural characteristics, split them based on height (C = trees <3m; D = trees >3m).

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
Closed

Structure Data (for upper layer lifeform)

| | Min | Max |
|-----------------|-------------------------------|-----------------------------|
| Cover | Closed (60-100% tree cover) | Closed (60-100% tree cover) |
| Height | Tree (> 3 m) | Tree (> 3m) |
| Tree Size Class | Med. 9-20" (swd)/11-20" (hwd) | |

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Indicator Species and Canopy Position

BEPA Upper
POTR5 Upper
ROAC Lower
VIED Lower

- Upper layer lifeform differs from dominant lifeform.

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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Class E 60 % Late Development 1

Structure Data (for upper layer lifeform)

Upper Layer Lifeform

Open

- Herbaceous
- Shrub
- Tree

| | Min | Max |
|-----------------|-------------------------------|--------------------------|
| Cover | Open (25-59% tree cover) | |
| Height | Tree (> 3 m) | |
| Tree Size Class | Med. 9-20" (swd)/11-20" (HWA) | Open (25-59% tree cover) |

Indicator Species and Canopy Position

BEPA Upper
 POTR5 Upper
 ALNUS Lower
 LEDUM Lower

Upper layer lifeform differs from dominant lifeform.

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 | Fire Intervals | | | | |
|-------------------------------------|-----------------------|--------|--------|-------------|----------------------|
| Historical Fire Size (acres) | Avg FI | Min FI | Max FI | Probability | Percent of All Fires |
| Avg 0 | Replacement | 190.7 | | 0.00524 | 72 |
| Min 0 | Mixed | 503.5 | | 0.00199 | 27 |
| Max 0 | Surface | | | | |
| | All Fires | 138 | | 0.00724 | |

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.

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)

References

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