16013

Western North American Boreal Treeline White Spruce-Hardwood Woodland - Hardwood

Model Date: 03/27/08 Report Date: 9/11/15

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| --- | --- | --- | --- |
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| None | None | None | None |

Vegetation Type

Forest and Woodland

Map Zones

68, 69, 70, 72, 73, 74, 75, 76, 77

Geographic Range

This system occurs commonly throughout the mountain ranges of southcentral AK and also near the northern and western limit of the boreal region (NatureServe 2008). It occurs beyond the coniferous treeline in Western and northern AK (NatureServe 2008). In MZ76 this type is found in Nowacki ecoregions 8, 9 and 10.

Biophysical Site Description

The following information was taken from the draft Boreal Ecological Systems description (NatureServe 2008):

Western North American Boreal Subalpine Balsam Poplar-Aspen Woodland occurs on well-drained upland terrain on southerly aspects on upper slopes to treeline. In the upper elevation range of this system, it can occur in the subalpine zone above the coniferous treeline. Soils are generally well-drained, shallow, and develop on colluvial deposits, glacial till, or bedrock.

Vegetation Description

Populus balsamifera ssp. balsamifera and/or P. tremuloides are the dominant overstory species. Trees are often stunted on exposed sties (Jorgenson et al. 2003). Plots from Denali National Park showed an average tree height of 2.4 meters for Dwarf Poplar Aspen Forest (Clark and Duffy 2006). Common understory shrubs include Viburnum edule, Rosa acicularis, Arctostaphylos spp., and Salix spp. A wide variety of herbaceous species may occur including Calamagrostis canadensis, Pyrola spp., and Aconitum delphinifolium (Viereck 1979, Jorgenson et al. 2003).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| POBA2 | Populus balsamifera | Balsam poplar |
| POTR5 | Populus tremuloides | Quaking aspen |
| VIED | Viburnum edule | Squashberry |
| ROAC | Rosa acicularis | Prickly rose |
| ARCTO3 | Arctostaphylos | Manzanita |
| SALIX | Salix | Willow |
| CACA4 | Calamagrostis canadensis | Bluejoint |

Disturbance Description

The disturbance dynamics of these high elevation forests are unclear but Wind/exposure and fire could be driving disturbance process. Balsam poplar and quaking aspen are fire adapted. Balsam poplar may be top killed by moderate intensity fires but can root sprout within several weeks following fire (Harris 1990). Aspen is also easily top killed by fire but fire stimulates vigorous root sprouting (Howard 1996).

The probability of fire in the state-and-transition simulation model is a best guess based on the assumption that this type would have a fire return interval similar to that of tundra types.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Min FI** | **Max FI** | **Percent of All Fires** |
| Replacement | 715 |  |  | 22 |
| Moderate (Mixed) | 205 |  |  | 78 |
| Low (Surface) |  |  |  |  |
| **All Fires** | **159** |  |  | **100** |

Scale Description

Large patch or small patch

Non-Fire Disturbances

Wind/Weather/Stress

Adjacency or Identification Concerns

Issues or Problems

This model was defined at the Fairbanks workshop as having an additional early seral stage dominated by alpine tundra shrubs, herbaceous vegetation or bare ground. This class was described as a persistent state occurring on sites frequently disturbed by avalanches or other weather events (snow, ice, wind, etc). It was later determined that this stage could not be adequately modeled with the two tree dominated stages (class A and B in the current model) and that it was probably best to represent the non-forested sites as a different BpS.

Native Uncharacteristic Conditions

Comments

REVIEW NEEDED:

-Is this BpS a component or seral stage of Western North American Boreal Treeline White Spruce-Hardwood Woodland? In 2021 NatureServe merged Western North American Boreal Subalpine Balsam Poplar-Aspen Woodland (BpS 1607) and Western North American Boreal Treeline White Spruce Woodland (BpS 16011-Boreal and 16012-Sub-boreal) into a single Ecological System called Western North American Boreal Treeline White Spruce-Hardwood Woodland. BpS 16011 and 16012 state: “The typical succession sequence for this type does not include a hardwood sere.”

This system was created during LANDFIRE National 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 (Nov. 07) and Anchorage modeling meetings (Dec. 08) and refined by Mitch Michaud and Michelle Schuman.

Succession Classes

Class A 25 Early Development 1 - All Structures

Structural Information

Tree Size Class: Seedling/Sapling <5"

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POBA2 | Populus balsamifera | Balsam poplar | Upper |
| POTR5 | Populus tremuloides | Quaking aspen | Upper |
| VIED | Viburnum edule | Squashberry | Lower |
| ROAC | Rosa acicularis | Prickly rose | Lower |

Description

This class is characterized by young stands of balsam poplar and/or aspen. Trees come in immediately via suckering in the post-disturbance stand along with the shrubs and herbaceous species. Wind desiccation can delay the development of trees.

Class B 75 Late Development 1 - All Structures

Structural Information

Tree Size Class: Pole 5–9" (swd)/5–11" (hwd)

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POBA2 | Populus balsamifera | Balsam poplar | Upper |
| POTR5 | Populus tremuloides | Quaking aspen | Upper |
| VIED | Viburnum edule | Squashberry | Lower |
| ROAC | Rosa acicularis | Prickly rose | Lower |

Description

This class is characterized by mature balsam poplar and/or aspen. Mature stands can be more open than early seral stands (class A) but not always. Hardwoods begin to senesce after about 150yrs and a mixed age stand develops.

References

Clark, M.H. and M.S. Duffy. 2006.Soil Survey of Denali National Park, Alaska. USDA NRCS. Available online at: http://soildatamart.nrcs.usda.gov/Manuscripts/AK651/0/DenaliPark.pdf.

Harris, Holly T. 1990. Populus balsamifera subsp. balsamifera. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2008, March 27].

Howard, Janet L. 1996. Populus tremuloides. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2008, March 27].

Jorgenson, M.T. et al. 2003. An ecological land survey for Fort Richardson, Alaska. Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire, ERDC/CRREL TR-03019.

NatureServe. 2008. International Ecological Classification Standard: Terrestrial Ecological Classifications. Draft Ecological Systems Description for Alaska Boreal and Sub-boreal Regions.

Viereck, L.A. 1979. Characteristics of treeline plant communities in Alaska. Holarctic Ecology. 2: 228-238.