

## Fire Regime Condition Class (FRCC) Interagency Handbook Reference Conditions

**Modeler:** KellyAnn Gorman, Randy Swaty    **Date:** 29 November 2007    **PNVG Code:** CBPN

**Potential Natural Vegetation Group:** Conifer Bog, embedded in fire-resistant system

**Geographic Area:** Northern parts of Michigan, Minnesota, and Wisconsin; also common in New York and New England in small bogs.

**Description:** Dense to open, low to medium-tall forests of needle-leaf evergreen and deciduous trees on peatland soils occurring as discontinuous pockets or stringers within upland vegetation communities having long-return-interval fire regimes, such as hardwood mixes. The canopy may be sparse and/or stunted, especially in acid (pH < 5.5) peatlands. Low hummocks and water-filled depressions may be present. Forested rich peatlands (pH > 5.5) occur in closed wet depressions, especially in small watersheds or catchment areas, and drains and toe slopes adjacent to streams; acid peatlands (pH < 5.5) occur in large, flat, poorly drained landscapes, especially peatlands on glacial lake plains, often forming adjacent to fen water tracks or forming in stagnant areas between heads of peatland streams and drains. Soils are very poorly drained, saturated throughout the growing season in normal years, and may be deep organic peat (acid and rich peatlands) or less than 12" of organic peat over sand (mineral soil bog).

The canopy is dominated by any combination of:

- black spruce (*Picea mariana*)
- larch or tamarack (*Larix laricina*)
- balsam fir (*Abies balsamea*)
- white cedar (*Thuja occidentalis*)

White pine (*Pinus strobus*) often occurs on drier hummocks, particularly in mineral soil bogs.

Broadleaf tree species may be present, especially:

- red maple (*Acer rubrum*)
- birch (*Betula* spp.)
- quaking aspen (*Populus tremuoides*)

The surface layer is dominated by mosses:

- primarily *Sphagnum*
- brown mosses dominate pools
- *Pleurozium schreberii* may also be abundant

Additional indicators for rich peatland:

- speckled alder (*Alnus incana*)
- three-leaved Solomon's seal (*Smilacina trifolia*)
- twinflower (*Linnaea borealis*)
- tufted loosestrife (*Lysimachia thrysiflora*)

Additional indicators for acid peatland:

- bog rosemary (*Andromeda glaucophylla*)
- Indian pipe (*Monotropa uniflora*)
- tussock cottongrass (*Eriophorum vaginatum*)

Additional indicators for mineral soil bogs:

- snowberry (*Symphoricarpos* spp.)
- Labrador tea (*Ledum groenlandicum*)
- raspberry (*Rubus* spp.)
- wintergreen (*Gaultheria procumbens*)
- alder (*Alnus* spp.)
- currant (*Ribes* spp.)

Mineral soil bogs may have a significant herb layer characterized by:

- bunchberry (*Cornus canadensis*)
- bracken fern (*Pteridium aquilinum*)
- goldthread (*Coptis* ?)
- lily-of-the-valley (*Maianthemum canadense*)
- sedge (*Carex* spp.)
- cinnamon fern (*Osmunda cinnamomea*)
- starflower (*Tridentalis borealis*)

**Fire Regime Description:** Fire Regime Group V. Conifer bogs generally occur as pockets in lowland areas surrounded by upland vegetation, and the fire regime is generally driven by the return interval of these upland vegetation types. Fires may occur following drought cycles and may be severe, but sites are typically very wet and fires are infrequent. Windthrow as a result of shallow rooting, including single-tree and small and large patches, and changes in hydrology, such as flooding or draining as a result of the construction or destruction of beaver dams, are the important disturbances in this system. Although severe fire can occur in spruce bogs, it is not common, with a rotation ranging from 220 to over 1,000 years with a mean of 540 years. Severe, catastrophic fires may convert the community to an open bog, rich swamp, or poor fen. Windthrow as a result of shallow rooting, including single-tree and small and large patches, and changes in hydrology, such as flooding or draining as a result of the construction or destruction of beaver dams, are the important disturbances in this system. Catastrophic windthrow may have occurred on a 400- to over 1,000-year rotation, with a median of 700 years. Light windthrow (small patches) occurred on a rotation of 40 to 380 years, with a median of 85 years.

**Vegetation Type and Structure**

Class*	Percent of Landscape	Description
<b>A:</b> post replacement	10	Young stands of mixed tamarack, black spruce, cedar and balsam fir; a shrub layer including leatherleaf, small cranberry, and blueberry; may include red maple; less than 55 yrs old
<b>B:</b> mid-seral closed	25	Mature stands dominated by cedar with some black spruce, balsam fir, and tamarack; may include red maple; some shrub layer; > 75% canopy closure; 55-115 yrs old
<b>E:</b> late- seral closed	65	Old forests returning to a more mixed tree composition and more shrub layer as the cedar canopy breaks up; > 50% canopy closure; over 115+ yrs old
Total	100	

\*Formal codes for classes A-E are: AESP, BMSC, CMSO, DLSO, and ELSC, respectively.

**Fire Frequency and Severity**

Fire Severity	Fire Frequency (yrs)	Probability	Percent, All Fires	Description
Replacement Fire	770	0.0013	100	Whether a shrub layer is present or not, trees have crown ratios nearing 1.0 so low-, moderate-, and high-severity fires all spread through the canopy.
Non-Replacement Fire	None	0	0	Because most species have thin bark and rarely reproduce vegetatively, non-replacement fires are effectively non-existent.
All Fire Frequency*	770	0.0013	100	

\*All Fire Probability = sum of replacement fire and non-replacement fire probabilities. All Fire Fire Frequency = inverse of all fire probability (previous calculation).

## References

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PERSONAL COMMUNICATION (if applicable):

Peer Review by Dave Cleland and Greg Nowacki, UFSF Northeast Region 9 Forest Ecologists, at Milwaukee, WI: 21 July, 2004.

## VDDT File Documentation

Assumptions:

- Native American fire was considered but was not determined to be a significant factor.
- The disturbance called Optional 1 is a placeholder representing changes in hydrology; it did not receive a probability because it happens infrequently on the scale of individual bogs and because it would be an open pathway, sending stands out of the model rather than resetting succession to A.



