

PROPERTY PLANNING COMMON ELEMENTS

COMPONENTS OF MASTER PLANS

HABITATS AND THEIR MANAGEMENT

Muskeg and Open Bog

Description

This page describes management of muskeg and open bog, the two communities at the most open end of the spectrum of acid peatland communities that also includes black spruce and tamarack. Both muskeg and open bog often occur in complexes with other peatland communities and often intergrade.

“Muskeg” is a term of Algonquin origin, roughly translating to “grassy bog” or “moss bog”. Muskeg is a very weakly minerotrophic acid peatland community characterized by a substrate of moss hummocks and thin scattering of stunted swamp conifers. It is floristically similar to open bog but differs in the greater presence and higher cover of conifers. Extensive openings devoid of trees are absent. Muskeg occurs across much of northern Wisconsin and reaches its southernmost range limit in central Wisconsin. Stands can vary in size from a few acres to extensive complexes of thousands of acres, and are most often associated with landforms such as glacial outwash or lakebeds and sometimes ground moraine. While plant diversity typically is low, this community is important to a number of boreal birds and butterflies, several of which are highly specialized. The ground layer is a continuous, often hummocky carpet of mosses. Sedges and herbs can include boreal bog sedge, few-seeded sedge, narrow-leaved cotton-grass, three-leaved gold-thread, moccasin-flower, northern blue flag, purple pitcher-plant, and swamp false Solomon’s-seal. Characteristic shrubs are all in the heath family and include leatherleaf, bog laurel, small cranberry, and creeping-snowberry. Black spruce is the most common tree, with tamarack and, less frequently, jack pine.

Open bog is similar to muskeg but is nearly treeless, with deep layers of *Sphagnum* mosses that accumulate over time as peat. A key characteristic of open bog is that the accumulation of peat isolates the plant community from contact with nutrient-enriched groundwater, resulting in conditions growing more anaerobic and acidic over time, with fewer key plant nutrients available. Open bogs in northern Wisconsin typically are found in kettle depressions of pitted outwash and morainal landforms or on the borders of lakes having very low nutrient inputs. As with muskeg, plant diversity is low but includes specialized species adapted to the extreme conditions. Tree cover is absent or very sparse, usually dominated by black spruce. Tamarack or jack pine may also be present. The shrub layer is important and is dominated by species in heath family, including leatherleaf, bog laurel, bog-rosemary, Labrador-tea, and small cranberry. Sedges and herbs include few-seeded sedge and few-flowered sedge, cotton-grasses, moccasin-flower, round-leaved sundew, and swamp false Solomon’s-seal. The bog surface is hummocky and uneven.

Ecological Landscape Opportunities

Ecological Landscape	Opportunity*	
	Muskeg	Open Bog
Central Lake Michigan Coastal		P
Central Sand Hills		I
Central Sand Plains		M



Ecological Landscape	Opportunity*	
	Muskeg	Open Bog
Forest Transition	I	I
North Central Forest	M	M
Northeast Sands	P	I
Northern Highland	M	M
Northern Lake Michigan Coastal		P
Northwest Lowlands	I	M
Northwest Sands	I	M
Superior Coastal Plain	I	M

M = Major; major opportunity exists in this Landscape; many significant occurrences are recorded, or restorations likely to be successful.

I = Important; several occurrences important to maintaining the community in the state occur in this Landscape.

P = Present; community is present in the Landscape but better opportunity exists elsewhere.

Rare Species

Many Species of Greatest Conservation Need (SGCN) are associated with muskeg and open bog based on the findings in [Wisconsin's 2015 Wildlife Action Plan](#). To learn more, visit the [Wetland communities page](#) and click on "Muskeg" and "Open Bog" under "Explore non-forested wetlands".

Threats

- Disrupted hydrology is a primary threat to muskeg and open bog. Alterations that change water levels beyond the range of natural variability, such as ditching, diking, irrigation, residential development, or road and right-of-way construction can impact the vegetation or lead to conversion of the community to a more forested type (conifer swamp) if conditions are drier or to sedge meadow, marsh, or open water if water levels increase. Mining runoff can alter surface or groundwater chemistry. Waters carrying excess sediments, nutrients, or contaminants can change plant community composition and structure when introduced into an acid peatland system. Drained sites may be invaded by non-native invasive plants.
- Muskegs and open bogs are threatened by commercial cranberry and wild rice cultivation and harvesting of mosses.
- Motorized vehicles can create ruts which alter hydrology, facilitate entry of sediments and pollutants, and serve as entry points for invasive plants.
- While non-native invasive plants are not yet a major problem in the interiors of muskegs and open bogs, species such as broad-leaved cat-tail, hybrid cat-tail, common reed, purple loosestrife, and reed canary grass have gained a foothold in areas flooded by human or beaver activity. Drained sites are susceptible to invasion by glossy buckthorn.
- Insect pests such as spruce budworm and parasites such as eastern dwarf mistletoe are a threat to the conifer component of muskegs.
- Muskeg and open bog are considered to be moderately to highly vulnerable to changes in temperature and precipitation associated with climate change. Both communities are sensitive to water budgets. Warmer temperatures may increase water losses, and drying could occur unless precipitation also increases. Drying could result in peat decomposition, leading to changes in plant species composition, increased risk of invasion



by non-native invasive plants, and increased risk of wildfires. Black spruce is likely to significantly decrease, and tamarack may also decline.

Management Techniques

- [Passive management](#)

Management Prescriptions

- Wherever possible, manage muskeg and open bog as part of a complex of related and interconnected upland and wetland habitats.
- Protect and maintain large and/or high-quality examples of muskeg and open bog, particularly when adjacent to other intact habitats. Maintain or increase habitat blocks and connectivity with surrounding native habitats, and soften sharp transitions between habitat types.
- Maintain site hydrology; restore whenever feasible.
- Use primarily passive management for muskeg and open bog. Invasive species control may occur. No forest management activities will be conducted within bogs or wetlands with small, slow-growing, non-merchantable trees.
- If access is needed across these areas, use of temporary roads will be limited to frozen-ground conditions only.
- Consider impacts to peatlands when conducting management in adjacent habitats, including potential effects on watershed and site hydrology, soils, and vegetation.
- Design and site roads, trails, rights-of-way, and culverts to avoid fragmenting and isolating peatland habitats and disrupting hydrology.

