



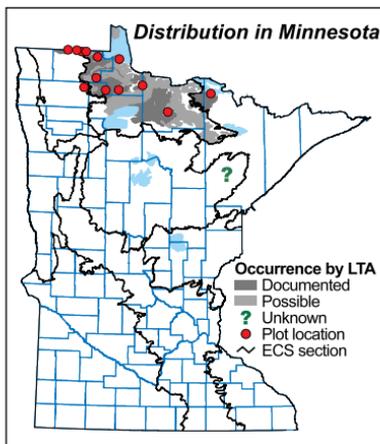
Northern Rich Spruce Swamp (Water Track)

Black spruce-dominated swamps on deep peat in large peatland complexes on the Glacial Lake Agassiz Plain. Typically occurs in settings influenced by lateral flow of mineral-rich groundwater, such as water tracks or spring fen seepage areas.

Vegetation Structure & Composition

Description is based on summary of vegetation data from 13 plots (relevés).

- **Moss layer** usually with >75% cover, characterized by hummocks and often by water-filled hollows. Typically dominated by *Sphagnum* in association with feathermosses (predominantly *Pleurozium schreberi*).
- **Forb layer** has variable cover, with gold-thread (*Coptis trifolia*), three-leaved false Solomon's seal (*Smilacina trifolia*), sweet-scented bedstraw (*Galium triflorum*) usually present.
- **Low-shrub layer** is dominated by Labrador tea (*Ledum groenlandicum*), with other ericaceous species such as small cranberry (*Vaccinium oxycoccos*) and lingonberry (*Vaccinium vitis-idaea*) usually also present.
- **Tall-shrub layer** is patchy to interrupted (25-75% cover), with dwarf alder (*Rhamnus alnifolia*) and red-osier dogwood (*Cornus sericea*) usually present.
- **Understory trees** include black spruce, tamarack, and white cedar.
- **Canopy** cover is typically 50-75%. Canopy is dominated by black spruce, with tamarack and white cedar frequently present, although sparse.



Landscape Setting & Soils

FPn71 occurs in large peatland complexes on the Glacial Lake Agassiz Plain in northwestern Minnesota, usually in settings influenced by lateral flow of mineral-rich groundwater associated with water tracks, or rarely, spring fen seepage areas. Soils are deep peat (>15 in [40cm]) underlain by calcareous lake clays with occasional sandy lenses. Surface water pH ranges from 5.6 to 7.2, with the most alkaline sites adjacent to spring fen seepage areas. Along water tracks, FPn71 typically occurs on slightly drier zones, with Northern Rich Fens (Water Track) (OPn91) in the lowest and wettest areas, and Northern Rich Tamarack Swamps (Water Track) (FPn81) in areas intermediate in water regime. In spring fen areas, FPn71 often borders the upwelling seepage zone, adjacent to Northern Extremely Rich Fens (OPn93).

Natural History

In FPn71, accumulation and build up of peat isolates the plant rooting zone from nutrient sources in the underlying mineral soil. FPn71 is influenced by lateral flow of mineral-rich groundwater (pH >5.5) emanating from lenses of sand or coarse-textured material in the underlying, predominantly clayey lake sediments. The flow of mineral-rich water prevents development of acidic and extremely nutrient poor conditions. The water table in FPn71 is subject to oscillations throughout the year but is typically high in spring and drops over the summer. Hummocks that rise above the water table provide habitats that are sufficiently aerated for growth of woody plants.

Catastrophic disturbances are relatively uncommon in FPn71. The community occurs in large poorly drained landscapes, where fires are rare except during periods of extreme drought. An analysis of Public Land Survey records indicates that in the past, the rotation of catastrophic fires in FPn71 was about 430 years. Although trees in the



community are somewhat susceptible to windthrow because of structurally weak peaty soils and shallow root systems, the historic rotation of catastrophic windthrow was actually longer than that of catastrophic fire, at about 700 years. On the other hand, smaller disturbances resulting in partial mortality of the canopy were somewhat common, with a rotation of about 80 years, and are presumed to have involved both patchy windthrow and surface fires.

Similar Native Plant Community Classes

● **FPn62 Northern Rich Spruce Swamp (Basin)**

FPn62, like FPn71, occurs on peat and has a tree canopy dominated by black spruce; FPn62, however, is present mainly in small isolated peatland basins in scoured bedrock terrain or on glacial drift in the northeastern part of the state. The distinction between the two classes may become blurred in northcentral Minnesota where glacial lake plain and bedrock topography overlap.

► **FPn62**—Lacks significant lateral groundwater flow. More likely to have bluebead lily (*Clintonia borealis*), woodland horsetail (*Equisetum sylvaticum*), bristly clubmoss (*Lycopodium annotinum*), bluejoint (*Calamagrostis canadensis*), and cinnamon fern (*Osmunda cinnamomea*).

► **FPn71**—Affected by lateral groundwater flow, which results in the formation of water tracks (usually visible on aerial photographs). More likely to have dwarf alder (*Rhamnus alnifolia*), lingonberry (*Vaccinium vitis-idaea*), northern marsh fern (*Thelypteris palustris*), pitcher plant (*Sarracenia purpurea*), and bog aster (*Aster borealis*).

● **FPn81 Northern Rich Tamarack Swamp (Water Track)**

When significant amounts of black spruce are present in the canopy of FPn81, it can be similar to FPn71, and the two classes often occur in the same peatland complexes. FPn81, however, is present in wetter settings, usually adjacent to rich fen water tracks.

► **FPn81**—More likely to have species characteristic of wetter and more open habitats, especially graminoids such as soft-leaved sedge (*Carex disperma*), sparse-fruited sedge (*C. tenuiflora*), creeping sedge (*C. chordorrhiza*), and cyperus sedge (*C. pseudocyperus*), as well as black chokeberry (*Aronia melanocarpa*) and willows (*Salix* spp.).

► **FPn71**—More likely to have understory species characteristic of slightly drier and shadier sites, including lingonberry, sweet-scented bedstraw, touch-me-nots (*Impatiens* spp.), and naked miterwort (*Mitella nuda*), as well as round-leaved orchis (*Amerorchis rotundifolia*), and Canada mayflower (*Maianthemum canadense*).

Native Plant Community Types in Class

● **FPn71a Rich Black Spruce Swamp (Water Track)**

FPn71a is the only community type recognized in this class at present.



photo by N.E. Aaseng, MN DNR

Roseau County, MN