



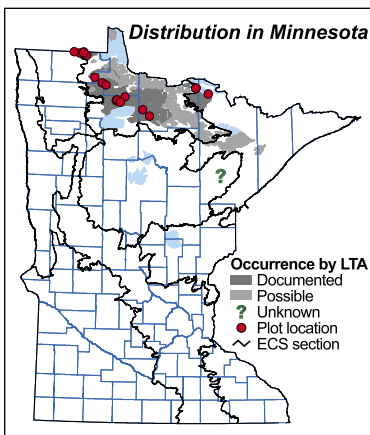
Northern Rich Tamarack Swamp (Water Track)

Tamarack-dominated swamps on deep peat in large peatland complexes on glacial lake plains or large peat-filled basins. Typically occurs in settings influenced by lateral flow of mineral-rich groundwater, such as water tracks.

Vegetation Structure & Composition

Description is based on summary of vegetation data from 20 plots (relevés).

- **Moss layer** usually has >50% cover and is characterized by hummocks and water-filled hollows. Typically dominated by *Sphagnum* with feathermosses common.
- **Forb layer** is sparse. Characteristic species are marsh cinquefoil (*Potentilla palustris*), tufted loosestrife (*Lysimachia thyrsiflora*), three-leaved false Solomon's seal (*Smilacina trifolia*), and pitcher plant (*Sarracenia purpurea*).
- **Graminoid layer** is sparse but diverse, typically including poor sedge (*Carex paupercula*), soft-leaved sedge (*C. disperma*), and bristle-stalked sedge (*C. leptalea*).
- **Low-shrub layer** has variable cover and is dominated by ericaceous species, especially Labrador tea (*Ledum groenlandicum*), with small cranberry (*Vaccinium oxycoccos*) and bog rosemary (*Andromeda glaucophylla*) common.
- **Tall-shrub layer** has variable cover, and is usually dominated by bog birch (*Betula pumila*), mountain fly honeysuckle (*Lonicera villosa*), and willows (*Salix* spp.).
- **Understory trees** include tamarack, black spruce, and, occasionally, white cedar.
- **Canopy** is patchy to interrupted (25-75% cover) and dominated by tamarack, typically with some black spruce.



Landscape Setting & Soils

FPn81 occurs in large peatland complexes on the Glacial Lake Agassiz plain and peat-filled basins in scoured bedrock terrain. It is present in settings influenced by lateral flow of mineral-rich groundwater that has passed through underlying calcareous sediments. FPn81 can form on slightly elevated teardrop-shaped islands within rich fen water tracks, in areas peripheral to water tracks, or as incipient water tracks identifiable on aerial photos as linear areas of sparse tamarack. Along water tracks, FPn81 typically occurs in areas intermediate between Northern Rich Fen (Water Track)(OPn91), which occupy the lowest and wettest zones, and Northern Rich Spruce Swamp (Water Track)(FPn71), which occur on elevated, slightly drier peat. Soils are deep peat (>15in [40cm]). Surface water pH ranges from 5.5 to 7.2. Water table is near the peat surface; hollows in the peat surface usually are water filled.

Natural History

In FPn81, accumulation and buildup of peat isolates the plant rooting zone from nutrient sources in the underlying mineral soil. Although accumulation of peat can lead to development of acidic, nutrient-poor conditions at peat surfaces, FPn81 is influenced by lateral flow of mineral-rich groundwater (pH >5.5) that maintains circumneutral pH and moderately rich conditions. The groundwater typically emanates from areas of calcareous glacial till—often outside of the peatlands in which FPn81 occurs—and flows beneath dense clayey sediments underlying the peatlands until it reaches lenses of sand or coarse-textured material and percolates to the surface. Hummocks that rise above the water table provide habitats that are sufficiently aerated for growth of woody plants. Because of influence from alkaline ground water, succession of FPn81 to poorer and



more acidic communities such as Northern Poor Conifer Swamp (APn81) or Northern Spruce Bog (APn80) is restricted to areas away from major groundwater flow.

In the past, catastrophic disturbances were uncommon in FPn81. Although present in large, poorly drained landscapes, FPn81 did burn on rare occasions during periods of extreme drought. An analysis of Public Land Survey records indicates the historic rotation of catastrophic fires in FPn81 was about 390 years. Because of structurally weak peaty soils and shallow root systems, trees in the community are somewhat susceptible to windthrow, with a historic rotation of catastrophic windthrow of about 590 years. 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

● FPn82 Northern Rich Tamarack Swamp (Western Basin)

FPn82 is similar to FPn81 but is generally confined to basins and the periphery of large glacial lake-plain peatlands, rather than along water tracks in the interior.

► **FPn82**—More likely to have red maple, paper birch, spinulose shield fern (*Dryopteris carthusiana*), three-cleft bedstraw (*Galium trifidum*), meadow horsetail (*Equisetum pratense*), and common strawberry (*Fragaria virginiana*). More likely to have at least 5% cover of speckled alder (*Alnus incana*) or bluejoint (*Calamagrostis canadensis*).

► **FPn81**—More likely to have round-leaved sundew (*Drosera rotundifolia*), sweet gale (*Myrica gale*), autumn willow (*Salix serissima*), cyperus sedge (*Carex pseudocyperus*), common reed grass (*Phragmites australis*), fringed brome (*Bromus ciliatus*), Labrador bedstraw (*Galium labradoricum*), and Arctic raspberry (*Rubus acaulis*). Speckled alder and bluejoint are rare and have <5% cover.

● OPn91 Northern Rich Fen (Water Track)

OPn91 can have scattered stunted tamaracks and appear similar to FPn81 with sparse canopies.

► **OPn91**—Tree cover is sparse (<25%), and trees are usually stunted (<16ft [5m] tall). More likely to have shade-intolerant species such as fen wiregrass sedge (*Carex lasiocarpa*), typically with >5% cover, lead-colored sedge (*C. livida*), white beak rush (*Rhynchospora alba*), scheuchzeria (*Scheuchzeria palustris*), and marsh cinquefoil (*Potentilla palustris*).

► **FPn81**—Tree cover is patchy to interrupted (25-75%). More likely to have willows and red-osier dogwood (*Cornus sericea*), and shade-tolerant species such as creeping snowberry (*Gaultheria hispidula*), blueberries (*Vaccinium myrtilloides/angustifolium*), one-sided pyrola (*Pyrola secunda*), dwarf raspberry (*Rubus pubescens*), crested fern (*Dryopteris cristata*), and soft-leaved sedge (*Carex disperma*).

Native Plant Community Types in Class

At present, data are insufficient to define types within FPn81, but in analyses of available data, three general groups separate geographically.

● **In northwestern Minnesota**, FPn81 is characterized by a mixed canopy of tamarack and black spruce or a pure canopy of tamarack. Indicator species include fowl manna grass (*Glyceria striata*), bog aster (*Aster borealis*), and prairie sedge (*Carex prairea*).

● **In northcentral Minnesota**, FPn81 is dominated by tamarack, usually with black spruce, and occurs on teardrop-shaped islands in water tracks in large peatlands. Indicator species include cyperus sedge (*Carex pseudocyperus*), black chokeberry (*Aronia melanocarpa*), wild calla (*Calla palustris*), and common reed grass.

● **In the Voyageurs National Park area**, FPn81 is characterized by a mixed canopy of tamarack and black spruce, often with white cedar. Indicator species include white cedar in the understory, showy lady's slipper (*Cypripedium reginae*), speckled alder, and sweet gale.