



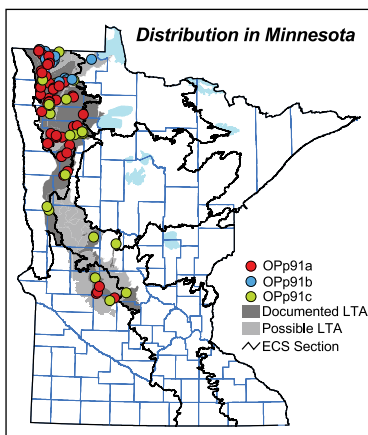
Prairie Rich Fen

Open graminoid-dominated peatlands in glacial lake plains and broad glacial drainageways in the prairie region. Dominated by fine-leaved sedges and grasses, with low shrubs absent to common.

Vegetation Structure & Composition

Description is based on summary of vegetation data from 128 plots (relevés).

- **Moss** cover is absent or sparse (< 25%) and composed of brown mosses, with *Sphagnum* absent.
- **Graminoid** cover is interrupted to continuous (75–100%). Fen wiregrass sedge (*Carex lasiocarpa*) is usually dominant, with stiff reedgrass (*Calamagrostis stricta*) and Buxbaum's sedge (*Carex buxbaumii*) subdominant. Other major components are clustered muhly grass (*Muhlenbergia glomerata*), lead-colored sedge (*Carex livida*), and tall cottongrass (*Eriophorum polystachion*). Aquatic sedge (*C. aquatilis*) is occasionally dominant where peat is less consolidated. Common reed grass (*Phragmites australis*) is sometimes present as scattered canes to denser clumps. Twig rush (*Cladium mariscoides*), an uncommon species in Minnesota, is a major component in a few areas.
- **Forb** cover is usually sparse (5–25%). Common species include marsh bellflower (*Campanula aparinoides*), bog aster (*Aster borealis*), grass-leaved goldenrod (*Euthamia graminifolia*), tufted loosestrife (*Lysimachia thyrsiflora*), and eastern panicled aster (*Aster lanceolatus*). Characteristic frequent but minor components are marsh St. John's wort (*Triadenum fraseri*) and Kalm's lobelia (*Lobelia kalmii*).
- **Shrub layer** is absent to patchy (0–55% cover), generally < 6ft (2m) tall, and often dominated by willows, with slender willow (*Salix petiolaris*) most frequent and sage-leaved willow (*S. candida*) slightly less common. Shrubby cinquefoil (*Potentilla fruticosa*) is common on many sites, with bog birch (*Betula pumila*) sometimes common.



Landscape Setting & Soils

OPp91 occurs in nearly level expanses of glaciolacustrine deposits in the LAP and in broad glacial drainageways farther south. A slight drainage gradient is characteristic. Substrates vary from mineral and muck to sapric or hemic peat derived from sedges and grasses and to a lesser extent brown mosses. Peat depth is variable, commonly 12–36in (30–90cm), but can be up to 50in (130cm). Peat is typically in contact with the underlying mineral material but may float on subsurface water layer. Surface water pH measurements in the LAP are mostly 7.0–8.0 and occasionally higher. Water table is at the surface much of the year, but shallow flooding usually occurs after snowmelt and heavy rains, and late season recession to several inches below the surface probably occurs in most years. The peat surface may dry out during periodic drought episodes.

Natural History

Mineral-rich groundwater maintains the substrate pH above neutrality and most mineral nutrients at high levels, but nitrogen and phosphorus are in short supply. Lateral down-slope movement of groundwater through the peat is a feature of OPp91, along with relatively subdued fluctuations in water-table level and brief periods of deep inundation. Peat accumulation in OPp91 is slower than in peatlands farther east, where average precipitation is greater and droughts are less severe; the potential depth of peat accumulation in OPp91 is limited by the increased susceptibility of the community to



surface drying. High fire frequency in the prairie landscape results in peat fires during dry periods that set back peat accumulation.

Similar Native Plant Community Classes

• OPn91 Northern Rich Fen (Water Track)

OPn91 and OPp91 are both dominated by fine-leaved sedges, but ericaceous shrubs are very rare in OPp91 while typically common in OPn91. In addition, insectivorous plants are common in OPn91 and absent from OPp91. Water flow in OPp91 is rarely sufficient to create the ribbed pattern often present in OPn91.

OPp91 Indicator Species	(freq%)	
	OPp91	OPn91
Grass-leaved goldenrod (<i>Euthamia graminifolia</i>)	51	-
Cut-leaved bugleweed (<i>Lycopus americanus</i>)	41	-
Rough bugleweed (<i>Lycopus asper</i>)	30	-
Hardstem and Slender bulrush*	30	-
Common mint (<i>Mentha arvensis</i>)	29	-
Eastern panicled aster (<i>Aster lanceolatus</i>)	45	2
Swamp milkweed (<i>Asclepias incarnata</i>)	39	2
Buxbaum's sedge (<i>Carex buxbaumii</i>)	74	6

*Hardstem and Slender bulrush (*Scirpus acutus* and *S. heterochaetus*)

OPn91 Indicator Species	(freq%)	
	OPp91	OPn91
Pitcher plant (<i>Sarracenia purpurea</i>)	-	65
White beak rush (<i>Rhynchospora alba</i>)	-	52
Small cranberry (<i>Vaccinium oxycoccos</i>)	-	44
Scheuchzeria (<i>Scheuchzeria palustris</i>)	-	43
Round-leaved sundew (<i>Drosera rotundifolia</i>)	-	35
Bog rosemary (<i>Andromeda glaucophylla</i>)	1	68
Candle-lantern sedge (<i>Carex limosa</i>)	1	67
Creeping sedge (<i>Carex chordorrhiza</i>)	2	70

• OPp93 Prairie Extremely Rich Fen

OPp93, like OPp91, is a graminoid-dominated community on saturated peat substrates but is characterized by constantly upwelling groundwater. OPp91, in comparison, lacks artesian pressure, although there may be lateral flow of water. Shallow flooding is a regular event in OPp91; the dominant species in the community have adaptations to conduct oxygen to roots from emergent leaves. Fen wiregrass sedge (*Carex lasiocarpa*) is almost always dominant in OPp91 and only occasionally common in OPp93.

OPp91 Indicator Species	(freq%)	
	OPp91	OPp93
Marsh St. John's wort (<i>Triadenum fraseri</i>)	31	-
Common mint (<i>Mentha arvensis</i>)	29	-
Marsh cinquefoil (<i>Potentilla palustris</i>)	27	-
Bog willow (<i>Salix pedicellaris</i>)	23	-
Northern blue flag (<i>Iris versicolor</i>)	19	-
Silverweed (<i>Potentilla anserina</i>)	19	-
Tufted loosestrife (<i>Lysimachia thyrsiflora</i>)	48	1
Water smartweed (<i>Polygonum amphibium</i>)	35	1

OPp93 Indicator Species	(freq%)	
	OPp91	OPp93
Sterile sedge (<i>Carex sterilis</i>)	-	76
Hair-like beak rush (<i>Rhynchospora capillacea</i>)	-	28
American grass-of-Parnassus (<i>Parnassia glauca</i>)	2	58
Big bluestem (<i>Andropogon gerardii</i>)	2	49
Mat muhly grass (<i>Muhlenbergia richardsonis</i>)	3	69
Riddell's goldenrod (<i>Solidago riddellii</i>)	2	45
Marsh arrowgrass (<i>Triglochin palustris</i>)	2	38
Prairie sedge (<i>Carex prairiea</i>)	3	45

• OPn92 Northern Rich Fen (Basin)

OPn92 appears similar to OPp91 but occurs in peatland basins without significant flow of groundwater, whereas OPp91 forms where water moves slowly through peat down a slight gradient. Both classes are dominated by fine-leaved sedges but differ sharply in subdominant graminoids. Ericaceous shrubs and speckled alder are often present in OPn92 but very rare in OPp91.

OPp91 Indicator Species	(freq%)	
	OPp91	OPn92
Grass-leaved goldenrod (<i>Euthamia graminifolia</i>)	51	-
Lead-colored sedge (<i>Carex livida</i>)	39	-
Kalm's lobelia (<i>Lobelia kalmii</i>)	30	-
Shrubby cinquefoil (<i>Potentilla fruticosa</i>)	29	-
Cut-leaved bugleweed (<i>Lycopus americanus</i>)	41	1
Buxbaum's sedge (<i>Carex buxbaumii</i>)	74	4
Eastern panicled aster (<i>Aster lanceolatus</i>)	45	3
Narrow reedgrass (<i>Calamagrostis stricta</i>)	92	9

OPn92 Indicator Species	(freq%)	
	OPp91	OPn92
Round-leaved sundew (<i>Drosera rotundifolia</i>)	-	39
Beaked sedge (<i>Carex utriculata</i>)	-	30
Leatherleaf (<i>Chamaedaphne calyculata</i>)	-	27
Broad-leaved arrowhead (<i>Sagittaria latifolia</i>)	-	26
Speckled alder (<i>Alnus incana</i>)	-	22
Large cranberry (<i>Vaccinium macrocarpon</i>)	-	17
Slender cottongrass (<i>Eriophorum gracile</i>)	1	23
Creeping sedge (<i>Carex chordorrhiza</i>)	2	44

• WMn82 Northern Wet Meadow/Carr

WMn82 is somewhat similar to OPp91 but is dominated by broad-leaved graminoids, including hummock-forming species, rather than the fine-leaved, non-hummock-forming species dominant in OPp91. WMn82 is often present on mineral soil and typically not on actively forming peat; OPp91 is always present on peat, which typically is actively forming.



OPp91 Indicator Species	(freq%) OPp91 WMn82
Lead-colored sedge (<i>Carex livida</i>)	39 -
Kalm's lobelia (<i>Lobelia kalmii</i>)	30 -
Shrubby cinquefoil (<i>Potentilla fruticosa</i>)	29 -
Seaside arrowgrass (<i>Triglochin maritima</i>)	26 -
Flattened spikerush (<i>Eleocharis compressa</i>)	41 1
Grass-leaved goldenrod (<i>Euthamia graminifolia</i>)	51 2
Buxbaum's sedge (<i>Carex buxbaumii</i>)	74 3
Stiff reed grass (<i>Calamagrostis stricta</i>)	92 5

*Small or Three-cleft bedstraw (*Galium tinctorium* or *G. trifidum*)

WMn82 Indicator Species	(freq%) OPp91 WMn82
Beaked sedge (<i>Carex utriculata</i>)	- 32
Arrow-leaved tearthumb (<i>Polygonum sagittatum</i>)	- 29
Speckled alder (<i>Alnus incana</i>)	- 22
Small or Three-cleft bedstraw*	1 47
Touch-me-not (<i>Impatiens</i> spp.)	2 39
Great water dock (<i>Rumex orbiculatus</i>)	4 55
Lake sedge (<i>Carex lacustris</i>)	8 73
Tussock sedge (<i>Carex stricta</i>)	5 43

• WMs83 Southern Seepage Meadow/Carr

WMs83 appears similar to OPp91 but is typically dominated by hummock-forming sedges, with the non-hummock-forming sedges that dominate OPp91 uncommon to rare. Forb diversity in WMs83 is much greater than in OPp91. Typical wet meadow forbs such as common boneset (*Eupatorium perfoliatum*) and touch-me-not (*Impatiens* spp.) are usually common in WMs83 while uncommon to rare in OPp91.

OPp91 Indicator Species	(freq%) OPp91 WMs83
Lead-colored sedge (<i>Carex livida</i>)	39 -
Marsh St. John's wort (<i>Triadenum fraseri</i>)	31 -
Kalm's lobelia (<i>Lobelia kalmii</i>)	30 -
Marsh cinquefoil (<i>Potentilla palustris</i>)	27 -
Bog willow (<i>Salix pedicularis</i>)	23 -
Flattened spikerush (<i>Eleocharis compressa</i>)	41 2
Fen wiregrass sedge (<i>Carex lasiocarpa</i>)	90 6
Shrubby cinquefoil (<i>Potentilla fruticosa</i>)	29 2

WMs83 Indicator Species	(freq%) OPp91 WMs83
White turtlehead (<i>Chelone glabra</i>)	- 18
Virginia mountain mint (<i>Pycnanthemum virginianum</i>)	1 29
Common boneset (<i>Eupatorium perfoliatum</i>)	2 49
Touch-me-not (<i>Impatiens</i> spp.)	2 43
Great water dock (<i>Rumex orbiculatus</i>)	4 58
Dwarf raspberry (<i>Rubus pubescens</i>)	2 26
Tussock sedge (<i>Carex stricta</i>)	5 57
Tall meadow-rue (<i>Thalictrum dasycarpum</i>)	3 34

• WMp73 Prairie Wet Meadow/Carr

WMp73 is similar to OPp91 but always occurs on mineral soil. WMp73 is dominated by broad- and fine-leaved sedges and grasses, most of which are uncommon to rare in OPp91, notably prairie cordgrass (*Spartina pectinata*). Conversely, the dominant fine-leaved sedges of OPp91 are rare in WMp73. The diversity of forbs is higher in WMp73 than in OPp91 and includes several wet-prairie species rarely encountered in the latter, such as prairie loosestrife (*Lysimachia quadriflora*) and golden alexanders (*Zizia aurea*). The western Minnesota distribution of WMp73 overlaps that of OPp91 primarily in the LAP, but WMp73 is also possible in the north end of the MIM.

OPp91 Indicator Species	(freq%) OPp91 WMp73
Lead-colored sedge (<i>Carex livida</i>)	39 -
Autumn willow (<i>Salix serissima</i>)	33 -
Marsh St. John's wort (<i>Triadenum fraseri</i>)	31 -
Marsh cinquefoil (<i>Potentilla palustris</i>)	27 -
Labrador bedstraw (<i>Galium labradoricum</i>)	26 -
Fen wiregrass sedge (<i>Carex lasiocarpa</i>)	90 4
Sage-leaved willow (<i>Salix candida</i>)	46 4
Tall cottongrass (<i>Eriophorum polystachion</i>)	44 4

WMp73 Indicator Species	(freq%) OPp91 WMp73
Dark green or Pale bulrush*	- 38
Golden alexanders (<i>Zizia aurea</i>)	- 17
Prairie loosestrife (<i>Lysimachia quadriflora</i>)	2 42
Prairie cordgrass (<i>Spartina pectinata</i>)	7 83
Golden or False golden ragwort**	2 17
Woolly sedge (<i>Carex pellita</i>)	10 71
Tall meadow-rue (<i>Thalictrum dasycarpum</i>)	3 21
Marsh vetchling (<i>Lathyrus palustris</i>)	9 42

*Dark green or Pale bulrush (*Scirpus atrovirens* or *S. pallidus*) **Golden or False golden ragwort (*Senecio aureus* or *S. pseud aureus*)

Native Plant Community Types in Class

• OPp91a Rich Fen (Mineral Soil)

Open peatlands dominated by wet meadow species and probably subject to frequent fire and drought. The environmental conditions of OPp91a are poorly understood. Substrates often have at least some well-decomposed peat overlying mineral soil. Species that are useful in distinguishing OPp91a from the other types in the class are water smartweed (*Polygonum amphibium*), Sartwell's sedge (*Carex sartwellii*), common mint (*Mentha arvensis*), woolly sedge (*Carex pellita*), woundwort (*Stachys palustris*), and spotted water hemlock (*Cicuta maculata*). Description is based on summary of vegetation data from 62 plots.

• OPp91b Rich Fen (Peatland)

Open peatlands on shallow to deep peat with vegetation that is often shorter, has sparser cover, and is less shrubby than the vegetation of the other types in this class. Patches of high concentrations of mineral salts can form at the peat surface during dry periods. Characteristic species include poor gerardia (*Agalinis purpurea*), silverweed (*Potentilla*



anserina), twig rush (*Cladium mariscoides*), hairy panic grass (*Panicum lanuginosum*), few-flowered spikerush (*Eleocharis pauciflora*), green sedge (*Carex viridula*), and Kalm's lobelia. Description is based on summary of vegetation data from 34 plots.

● **OPp91c Rich Fen (Prairie Seepage)**

Open peatlands on deep peat in seepage zones, on floating mats, and in peatlands with a constant water supply. OPp91c is more protected from fire and drought than the other types in the class and therefore has greater shrub cover. At least some species typical of northern peatlands are usually present, including tamarack, ericaceous shrubs, and buckbean (*Menyanthes trifoliata*). Other useful indicators are bog birch, common marsh marigold (*Caltha palustris*), prairie sedge (*Carex prairea*), and flat-topped aster (*Aster umbellatus*). Description is based on summary of vegetation data from 32 plots.

photo by R. P. Dana, MN DNR



Kittson County, MN



OPp91 Prairie Rich Fen — Species Frequency & Cover

Forbs, Ferns & Fern Allies			freq%		cover	
Marsh bellflower (<i>Campanula aparinoides</i>)	55	•	Clasping dogbane (<i>Apocynum sibiricum</i>)	9	•	
Bog aster (<i>Aster borealis</i>)	54	••	Marsh vetchling (<i>Lathyrus palustris</i>)	9	•	
Grass-leaved goldenrod (<i>Euthamia graminifolia</i>)	51	••	Lesser fringed gentian (<i>Gentianopsis procera</i>)	9	•	
Tufted loosestrife (<i>Lysimachia thyrsiflora</i>)	48	••	Poor gerardia (<i>Agalinis purpurea</i>)	9	••	
Eastern panicled aster (<i>Aster lanceolatus</i>)	45	••	Grasses & Sedges			
Cut-leaved bugleweed (<i>Lycopus americanus</i>)	41	•	Stiff reed grass (<i>Calamagrostis stricta</i>)	92	•••	
Swamp milkweed (<i>Asclepias incarnata</i>)	39	•	Fen wiregrass sedge (<i>Carex lasiocarpa</i>)	90	•••	
Northern bugleweed (<i>Lycopus uniflorus</i>)	37	•	Buxbaum's sedge (<i>Carex buxbaumii</i>)	74	•••	
Water smartweed (<i>Polygonum amphibium</i>)	35	••	Tall cottongrass (<i>Eriophorum polystachion</i>)	44	••	
Marsh St. John's wort (<i>Triadenum fraseri</i>)	31	•	Flattened spikerush (<i>Eleocharis compressa</i>)	41	••	
Kalm's lobelia (<i>Lobelia kalmii</i>)	30	•	Clustered muhly grass (<i>Muhlenbergia glomerata</i>)	41	•••	
Rough bugleweed (<i>Lycopus asper</i>)	30	•	Lead-colored sedge (<i>Carex livida</i>)	39	•••	
Common mint (<i>Mentha arvensis</i>)	29	•	Hardstem and Slender bulrush**	30	•	
Marsh cinquefoil (<i>Potentilla palustris</i>)	27	•	Sarwell's sedge (<i>Carex sarwellii</i>)	27	•••	
Labrador bedstraw (<i>Galium labradoricum</i>)	26	•	Tufted hair grass (<i>Deschampsia cespitosa</i>)	21	••	
Seaside arrowgrass (<i>Triglochin maritima</i>)	26	•	Aquatic sedge (<i>Carex aquatilis</i>)	19	•••	
Canada goldenrod (<i>Solidago canadensis</i>)	24	•	Baltic rush (<i>Juncus arcticus</i>)	17	•••	
Silverweed (<i>Potentilla anserina</i>)	19	••	Common reed grass (<i>Phragmites australis</i>)	16	••	
Marsh skullcap (<i>Scutellaria galericulata</i>)	19	•	Bluejoint (<i>Calamagrostis canadensis</i>)	13	•	
Northern blue flag (<i>Iris versicolor</i>)	19	•	Hairy panic grass (<i>Panicum lanuginosum</i>)	12	••	
Germander (<i>Teucrium canadense</i>)	17	•	Twig rush (<i>Cladium mariscoides</i>)	10	•••	
Spotted Joe pye weed (<i>Eupatorium maculatum</i>)	17	•	Woolly sedge (<i>Carex pellita</i>)	10	•••	
Swamp lousewort (<i>Pedicularis lanceolata</i>)	17	•	Lake sedge (<i>Carex lacustris</i>)	8	••	
Linear-leaved, Marsh, or Downy willow-herb*	16	•	Shrubs			
Giant, Sawtooth, or Nuttall's sunflower**	15	•	Slender willow (<i>Salix petiolaris</i>)	59	••	
Woundwort (<i>Stachys palustris</i>)	14	••	Sage-leaved willow (<i>Salix candida</i>)	46	••	
Common marsh marigold (<i>Caltha palustris</i>)	14	•	Autumn willow (<i>Salix serissima</i>)	33	•	
Giant goldenrod (<i>Solidago gigantea</i>)	14	•	Shrubby cinquefoil (<i>Potentilla fruticosa</i>)	29	•••	
Northern bog violet (<i>Viola nephrophylla</i>)	13	•	Pussy willow (<i>Salix discolor</i>)	23	•	
Northern marsh fern (<i>Thelypteris palustris</i>)	13	•	Bog willow (<i>Salix pedicellaris</i>)	23	•	
Spotted water hemlock (<i>Cicuta maculata</i>)	12	••	Bog birch (<i>Betula pumila</i>)	21	••	
Swamp thistle (<i>Cirsium muticum</i>)	11	•	Bebb's willow (<i>Salix bebbiana</i>)	18	•	
Broad-leaf cattail (<i>Typha latifolia</i>)	10	•	Hoary-fruited willow (<i>Salix macacalliana</i>)	13	•	
	9	••	Heart-leaved willow (<i>Salix eriocephala</i>)	10	•	

*Linear-leaved, Marsh, or Downy willow-herb (*Epilobium leptophyllum*; *E. palustre*, or *E. strictum*) **Giant, Sawtooth, or Nuttall's sunflower (*Helianthus giganteus*, *H. grosseserratus*, or *H. nuttallii*) ***Hardstem and Slender bulrush (*Scirpus acutus* and *S. heterochaetus*)