

Vascular Flora of Momence Wetlands, Kankakee County, Illinois

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ABSTRACT

The vascular flora of Momence Wetlands, Kankakee County, Illinois, was studied during the 1998 - 1999 growing seasons. A total of 385 taxa were found: 6 ferns and fern-allies, 89 monocots, and 290 dicots. Families with the largest number of taxa included the aster family (Asteraceae) with 59 taxa, grass family (Poaceae) 44 taxa, and sedge family (Cyperaceae) 26 taxa, of which 17 were members of the sedge genus (*Carex*). This is the northern-most location in Illinois for four taxa generally associated with swamps in southern Illinois: swamp cottonwood (*Populus heterophylla*), pumpkin ash (*Fraxinus profunda*), climbing hempweed (*Mikania scandens*), and the state threatened American storax (*Styrax americana*). Three forest communities (wet floodplain, wet-mesic floodplain, dry-mesic upland) were surveyed, and density (stems/ha), basal area (m²/ha), importance value, and average diameter were determined for each overstory species. Wet floodplain forest was dominated by silver maple (*Acer saccharinum*); wet-mesic floodplain forest by swamp white oak (*Quercus bicolor*), pin oak (*Quercus palustris*), American elm (*Ulmus americana*), and red/green ash (*Fraxinus pennsylvanica*); and dry-mesic upland forest by black oak (*Quercus velutina*) and white oak (*Quercus alba*). A wet-mesic prairie remnant dominated by northern dewberry (*Rubus flagellaris*), downy sunflower (*Helianthus mollis*), big bluestem (*Andropogon gerardii*), and tall goldenrod (*Solidago canadensis*) was also surveyed.

INTRODUCTION

The Momence Wetlands (MW) study area consists of two sites, Momence Wetlands Nature Preserve (MWNP) and Momence Wetlands Land and Water Reserve (MWLWR). MW is located in eastern Kankakee County, Illinois, in and along the Kankakee River within three miles of the Illinois/Indiana border. MWNP and MWLWR are owned by the Illinois Department of Natural Resources. The MWNP is located 5 miles east of Momence, Illinois, in a bend of the Kankakee River channel (T 31N, R 14E, SE1/4 Section 13 and NE1/4 Section 24). This preserve, 29.2 ha (72 acres) in size, contains the best remaining example of wet-mesic floodplain forest in the Kankakee River drainage region. MWLWR, 210.2 ha (519 acres) in size, is located in and along the Kankakee River about 1.5 mile west of MWNP (T 31N, R 14E, S1/2 Section 15, S1/2 Section 16, NE1/4 Sec-

tion 16, NE1/4 Section 21 and N1/2 Section 22). No previous studies have been published on the vascular flora of these areas.

MWNP was dedicated as a nature preserve in 1988, and MWLWR was registered as a Land and Water Reserve in 1998 (Horn 1998). Although subjected to some disturbances, particularly logging (some within the past 15 years), both areas have a relatively high diversity of plant and animal life. This study was undertaken to document the vascular flora of MWNP and MWLWR and to determine composition and structure of the natural plant communities.

MATERIALS AND METHODS

At various times throughout the growing seasons, from mid-summer of 1998 through late fall of 1999, field trips were made to the MW. During each trip voucher specimens were collected, habitat data for each taxon determined, and plant communities delineated. The material collected was identified and deposited in the herbarium of the Illinois Natural History Survey (ILLS), Champaign, Illinois. Categorizing native versus non-native taxa followed Fernald (1950), Steyermark (1963), Mohlenbrock (1986), and Gleason and Cronquist (1991) publications.

During the summer of 1998, a 3.125 ha (125 m x 250 m) section was located within the wet-mesic floodplain forest community at the MWNP, and a 1 ha (100 m x 100 m) section was located in each of the three forest communities at the MWLWR (wet floodplain forest, wet-mesic floodplain forest, and dry-mesic upland forest). Each section was divided into 25 m x 25 m quadrats for ease in sampling the woody overstory. In each quadrat, all living and dead-standing woody individuals of 10 cm dbh (diameter at breast height, 1.4 meter above the ground) and above were identified and their diameters recorded. From these data, density (stems/ha), basal area (m²/ha), relative density, relative dominance, importance value (IV), and average diameter (cm) were calculated for each species. Determination of the IV follows the procedure used by McIntosh (1957), and is the sum of the relative density and relative dominance of a given species. Density (stems/ha) of woody understory species was determined using 10 to 20 nested circular plots (0.0001, 0.001, and 0.01 ha) per section, randomly located along transects through the study areas. Four additional 0.0001 ha circular plots were located 6 m from each center along the cardinal compass directions. In 0.0001 ha circular plots, tree seedlings (\leq 50 cm tall) and all shrubs were counted. In 0.001 ha circular plots, small saplings ($>$ 50 cm tall and $<$ 2.5 cm dbh) were counted, and in 0.01 ha circular plots large saplings (2.5-9.9 cm dbh) were counted. Nomenclature follows Mohlenbrock (1986) and/or Gleason and Cronquist (1991).

Ground layer species (including woody species $<$ 0.5 m tall) of the small wet-mesic prairie remnant were scrutinized using 0.5 m x 0.5 m quadrats located at each meter mark along an east/west 50 m transect. Quadrats were located right (odd-numbered meters) or left (even-numbered meters) from the transect; distance was determined using a random numbers table (single digit). The cover of each species rooted in a quadrat was determined using Daubenmire (1959) cover classes as modified by Bailey and Poulton (1968) (class 1 = 0 to 1%, class 2 = $>$ 1 to 5%, class 3 = $>$ 5 to 25%, class 4 = $>$ 25 to 50%, class 5 = $>$ 50 to 75%, class 6 = $>$ 75 to 95%, class 7 = $>$ 95 to 100%). From these data, cover (%),

relative cover, frequency (%), relative frequency, and importance value of each species were calculated.

The Floristic Quality Index (FQI) was determined for the nature preserve (MWNP) and each natural community using the Coefficient of Conservation (C) assigned to each species according to Taft et al. (1997). The Index provides a measure of the floristic integrity or level of disturbance of a site. As used here, the FQI is a weighted index of species richness (N), and is the arithmetic product of the mean C, multiplied by the square-root of the species richness (\sqrt{N}) of an inventory site [FQI = mean C(\sqrt{N})].

DESCRIPTION OF THE STUDY AREA

The study areas lie within the Kankakee Sand Area Section of the Grand Prairie Division (Schwegman et al. 1973). The Kankakee Sand Area Section was formed approximately 14,000 years ago during the Kankakee Torrent when incising of the Illinois River Valley drained the large glacial lakes of this area (William and Frye 1970). The MW are in and along the Kankakee River, a slow naturally meandering river that dissects part of the Wisconsin Till Plain, and drains about 721,062 ha (1,780,400 acres) of land in Illinois and adjacent northwestern Indiana (Suloway and Hubbell 1994, Indiana Division of Water, personal communication). The 1,010 ha (2,500 acres) MW complex is the last vestige of the Grand Kankakee Marsh in Illinois. The Grand Kankakee Marsh once encompassed nearly 403,715 ha (1,000,000 acres) extending on both sides of the Kankakee River in Illinois and Indiana (Bridges 1934). The six mile stretch of the Kankakee River from Momence, Illinois, to the Indiana state line is the most natural segment of the Kankakee valley that remains (Horn 1998). Here, the MW are recognized by the Biological Stream Characterization as one of Illinois' finest water resources and contains outstanding biological features. Also, the Illinois Natural Areas Inventory (INAI) identified the Kankakee River as a high quality system. The soils of the study areas are alluvial deposits, primarily Gilford fine sandy loam, wet. This soil is found in areas which are nearly level to depressional and subject to frequent flooding or ponding (Paschke 1979).

The Kankakee River traversed east/west through the center of Momence Township (T 31N, R 14E) and contained numerous islands. About half of the Government Land Office survey notes for this area are not legible (Public Land Survey 1834). However, enough can be read to give a fairly good idea of the vegetation. South of the river was mostly "level wet prairie unfit for cultivation" and extensive shallow ponds that were rarely more than a few feet deep. A small forested area, less than one square mile in size and dominated by black and white oaks, occurred on slightly higher ground near the river's edge. The islands were described as being mostly covered with water and "thickly set with swamp [probably silver] maple and birch"; bur oak (*Quercus macrocarpa*) and ash were occasionally mentioned, as was spice [probably spicebush (*Lindera benzoin*)] in the understory. The land at the river's edge was described as "rich bottom too wet for cultivation, subject to occasional inundation of about 4 feet as appears by the water marks on the trees". North of the river, prairie dominated, mostly "wet level prairie, soil unfit for cultivation;" and some extensive ponds covering more than two square miles were also found, as were higher, dry prairies "fit for cultivation." Forested areas were more common along the northern edge of the river channel and a few groves occurred back from

the river. The dominant trees described were black oak (*Quercus velutina*), white oak (*Quercus alba*), red oak (*Quercus rubra*), and bur oak, with no undergrowth other than hazel (*Corylus americana*) occasionally mentioned. Characteristic sand savanna and sand prairie vegetation prevailed on higher sandy grounds (King 1981).

The study areas are nearly level and small changes in elevation were responsible for dramatic changes in species composition and forest structure. Within the MW study area, there were extensive low depressions (sloughs) created by naturally cut-off river channels, wet floodplains, wet-mesic floodplains that were <1 m above the wet floodplains, and upland terraces that were 3 to 5 m above the wet floodplains. Elevation varied from 188 m at the rivers edge to 194 m above sea level on the terraces.

In this survey, six natural plant communities were recognized within the MW study area. The cultural communities were represented by successional fields, levees, roadsides, and abandoned railroad right-of-ways. Three natural wetland communities were present: a narrow extensive network of shrub swamps/marshes, extensive wet floodplain forest, and less extensive scattered wet-mesic floodplain forest. Two natural upland communities were present: a slightly elevated dry-mesic upland forest bordering the northeast side of MWLWR and a small wet-mesic prairie remnant along a railroad right-of-way.

The climate of east-central Illinois is continental with cool winters, hot summers, and little or no water deficit in any season of the year (Page 1949, Fehrenbacher et al. 1967, Schwegman et al. 1973). In Lowell, Indiana (19 km to the northeast) the Midwestern Regional Climate Center (2002) reports, historical climate data from 1971 to 2000, the mean annual precipitation is 102.6 cm, with the month of June having the highest rainfall (12.2 cm). Mean annual temperature in Lowell is 9.3°C with the hottest month being July (average of 22.6°C) and the coldest January (average of -6.1°C). The number of frost free days ranges from 136 to 188, with the average of 159 days.

RESULTS AND DISCUSSION

Vascular Plant Species Present

The documented flora in the MW consisted of 385 species and subspecific taxa within 243 genera and 87 families. Of these taxa, 58 (15.1%) were not native to Illinois. Pteridophytes were poorly represented at MW, accounting for only 6 taxa (2% of all taxa) while Spermatophytes accounted for the remainder. Among the Spermatophytes, monocots accounted for 89 taxa in 48 genera and 13 families (23% of all taxa), while dicots accounted for 290 taxa in 189 genera and 68 families (75% of all taxa). For a complete list of taxa see Appendix 1.

Habitat Types Present

Natural plant communities were designated primarily using the community classification of White and Madany (1978) and are outlined in Figures 1 & 2. Most of these communities have been influenced by various disturbances such as flooding, fire, fire suppression, grazing, logging, wildlife activity, such as browsing by white-tailed deer (*Odocoileus virginianus*), and past management practices (Ebinger and McClain 1991).

Shrub swamps/marshes: This community was widely scattered throughout the MW and accounted for 7.6 ha (26%) of the MWNP and 31.5 ha (15%) of the MWLWR (Figures 1 & 2). Restricted to the network of sloughs this dynamic community may change from year to year as the water level within the Kankakee River channel changes and new channels are formed and others cut-off. The slough channels varied greatly in species composition; determined at least somewhat by frequency and duration of inundation. The scattered trees included: silver maple (*Acer saccharinum*), red/green ash (*Fraxinus pennsylvanica*), pin oak (*Quercus palustris*), river birch (*Betula nigra*), swamp cottonwood (*Populus heterophylla*), and pumpkin ash (*Fraxinus profunda*). Swamp cottonwood and pumpkin ash were rare at the MW, their most northern vouchered range in Illinois. The dominant shrub was buttonbush (*Cephalanthus occidentalis*). Dominant herbs included: halberd-leaved rose mallow (*Hibiscus laevis*), rice cutgrass (*Leersia oryzoides*), white grass (*Leersia virginica*), ditch stonecrop (*Penthorum sedoides*), clearweed (*Pilea pumila*), mild water pepper (*Polygonum hydropiperoides*), swamp dock (*Rumex verticillatus*), common arrowleaf (*Sagittaria latifolia*), and lizard's-tail (*Saururus cernuus*). One frequent herb was climbing hempweed (*Mikania scandens*); this is the most northern vouchered range for this species in Illinois. The floristic integrity, as measured using the FQI of Taft et al. (1997), was 25.95 for the site; the mean C was 3.08 (Table 1). Only four species were encountered with a C greater than seven: eastern mosquito fern (*Azolla caroliniana*), pumpkin ash, climbing hempweed, and swamp cottonwood. Seven adventive species were included in calculating the FQI. Excluding these species, the FQI of the site would be 27.36 and the mean C 3.42. For a floodplain community this is a good mean C (above 3.00) and indicates the community has good floristic quality (Taft et al. 1997).

Wet floodplain forest: This community accounted for 11.8 ha (40.4%) of the MWNP and 112.8 ha (53.7%) of the MWLWR (Figure 1 & 2). The wet floodplain forest was characterized by frequent flooding during the growing season and a low diversity of woody and herbaceous species (117 species). The overstory of the wet floodplain forest at the MWLWR contained six tree species with a density of 369 stems/ha and basal area of 34.09 m²/ha (Table 2). Silver maple dominated, was common in all diameter classes, had an average diameter of 39.5 cm, and an IV of 114.4. American elm (*Ulmus americana*) and green/red ash were mostly restricted to the small diameter classes, had an average diameter of 19.6 cm and 26.9 cm respectively. Dead-standing individuals, most commonly American elm and silver maple, averaged 45 stems/ha with a basal area of 2.67 m²/ha. The understory was very open with few saplings (170 stems/ha) while numerous tree and shrub seedlings (97,100 stems/ha) were encountered (Table 3). Nearly all of the seedlings were <10 cm tall and most may soon die due to dense shade and flooding. Common woody vines included: trumpet creeper (*Campsis radicans*) and poison ivy (*Toxicodendron radicans*). Common herbaceous species included: three-seeded Mercury (*Acalypha rhomboidea*), paniced aster (*Aster lanceolatus*), common beggar-ticks (*Bidens frondosa*), wood nettle (*Laportea canadensis*), catchfly grass (*Leersia lenticularis*), Cardinal flower (*Lobelia cardinalis*), clearweed, smartweed (*Polygonum punctatum*), and lizard's-tail. The FQI was 30.83 for the site, while the mean C was 2.85 (Table 1). Only two species were encountered with a C greater than seven: eastern mosquito fern and climbing hempweed. Ten adventive species were included in calculating the FQI. If these species were excluded from the calculations, the FQI of the site was 32.17 and the mean C was 3.11 (Table 1).

Wet-mesic floodplain forest: This community accounted for 9.8 ha (33.6%) of the MWNP and 16.1 ha (7.7%) of the MWLWR (Figures 1 & 2). The wet-mesic floodplain forest was characterized by flooding during the growing season that was much less frequent and of a much shorter duration than the wet floodplain forest. An obvious feature of this community was the large number of dead-standing trees. The diversity of tree species was greater than for the wet floodplain forest with swamp white oak, pin oak and silver maple being the dominant tree species. Woody understory trees and shrubs were relatively dense with numerous saplings, especially spicebush and red/green ash. American storax (*Styrax americana*), a state threatened shrub, was sporadic, growing at the margin of the wet-mesic floodplain forest where it joins the shrub swamp/marsh community. MW is the only known site in northern Illinois for this species. Common woody vines included: trumpet creeper, moonseed vine (*Menispermum canadense*), hispid greenbrier (*Smilax hispida*), and poison ivy. Herbaceous species included: green dragon (*Arisaema dracontium*), creeping cress (*Cardamine bulbosa*), loosestrife (*Lysimachia hybrida*), sensitive fern (*Onoclea sensibilis*), regal fern (*Osmunda regalis*), and Virginia knotweed (*Polygonum virginiana*). The FQI was 36.25 for the site, while the mean C was 3.38 (Table 1). Seven species were encountered with a C greater than seven: winterberry (*Ilex verticillata*), stalked water horehound (*Lycopus rubellus*), climbing hempweed, Indian pipe (*Monotropa uniflora*), regal fern, American storax, and maple-leaved viburnum (*Viburnum acerifolium*). Eleven adventive species were included in calculating the FQI. If these species were excluded from the calculations the FQI of the site was 38.14 and the mean C was 3.74. This floodplain community had the highest FQI and C values at the MW. In general, an FQI greater than 35 is at sites that are regionally noteworthy (Taft et al. 1997).

Within the wet-mesic floodplain forest at the MWNP, the overstory contained eight tree species (five species were common) with a density of 387 stems/ha and basal area of 30.64 m²/ha (Figure 1; Table 2). Silver maple dominated, was common in all diameter classes, had an average diameter of 27.2 cm, and an IV of 75.2. Other common species included: pin oak which ranked second with an IV of 53.7; green/red ash which ranked third with an IV of 27.4 and swamp white oak which ranked fourth with an IV of 20.3, as did American elm. A conspicuous feature of this community was the large number of dead-standing trees which averaged 57 stems/ha and had a basal area of 4.46 m²/ha (Table 4). Tree seedlings were extremely common, averaging >1,231,000 stems/ha (Table 3). Nearly all tree seedlings were <10 cm tall and most would soon die due to dense shade and flooding. As in the wet floodplain forest community, the understory was very open with few saplings (276 stems/ha) present.

Within the wet-mesic floodplain forest at the MWLWR, the overstory contained nine tree species (four species were common) with a density of 339 stems/ha and basal area of 26.58 m²/ha (Figure 2; Table 2). Swamp white oak and pin oak dominated, were common in all diameter classes, had an average diameter of 38.2 cm and 30.1 cm respectively, and an IV of 56.3 and 48.7 respectively. Other common species, American elm, red/green ash, and silver maple, occurred mostly in the lower diameter classes and had average diameters near 20 cm dbh. Dead-standing individuals, most commonly American elm and swamp white oak, averaged 38 stems/ha with a basal area of 2.35 m²/ha. Tree seedlings were numerous but less abundant than at the MWNP, with an average of 76,200 stems/ha

(Table 3). Nearly all tree seedlings were <10 cm tall. The understory was relatively dense with many small saplings, 2,950 stems/ha, with large numbers of spice bush and a few other shrubs along with many saplings of red/green ash.

Dry-mesic upland forest: This community accounted for 31.2 ha (14.8%) of the MWLWR (Figure 2). The dry-mesic upland forest overstory contained five tree species (three species were common) with a density of 252 stems/ha and basal area of 22.29 m²/ha (Table 2). Black oak dominated, was the most common in all but the two smallest diameter classes, had an average diameter of 47.2 cm, and an IV of 109 (Table 2). Other common species included white oak which ranked second with an IV of 53.9 and was common in the smaller diameter classes. Black cherry (*Prunus serotina*) ranked third with an IV of 34.1 and dominated the 10 - 19 cm diameter class. Black oaks were the only dead-standing individuals encountered and averaged 7 stems/ha with a basal area of 1.14 m²/ha. Tree seedlings were common but less abundant than in the floodplain forest, averaging 28,200 stems/ha (Table 3). The understory was relatively dense with many saplings, 5,280 stems/ha. Black cherry dominated both the small and large saplings with 1,500 stems/ha and 2,070 stems/ha respectively (Table 3). Common woody vines included: Virginia creeper (*Parthenocissus quinquefolia*), poison ivy, and riverbank grape (*Vitis riparia*). Herbaceous species included: rue anemone (*Anemonella thalictroides*), short-headed bracted sedge (*Carex cephalophora*), Pennsylvania oak sedge (*Carex pennsylvanica*), nodding fescue (*Festuca obtusa*), false dandelion (*Krigia biflora*), Solomon's seal (*Polygonatum biflorum*), and woodland goldenrod (*Solidago caesia*). The FQI was 30.84 for the site, while the mean C was 3.01 (Table 1). Only two species were encountered with a C greater than seven: downy green sedge (*Carex swanii*) and maple-leaved viburnum. Thirteen adventive species were included in calculating the FQI. If these species were excluded from the calculations the FQI of the site would be 32.90 and the mean C 3.43.

Wet-mesic prairie: This community accounted for 0.4 ha (0.2%) of the MWLWR (Figure 2). This small wet-mesic prairie remnant is located along the northern edge of the MWLWR next to a railroad right-of-way and was characterized by common prairie grasses and forbs. Species diversity was relatively high; 31 species recorded in the plots (Table 5). The common prairie grasses included: big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*), and cord grass (*Spartina pectinata*). The important forbs were downy sunflower (*Helianthus mollis*), tall goldenrod (*Solidago canadensis*), rigid goldenrod (*Solidago rigida*), and heath aster (*Aster ericoides*). The important shrub was Northern dewberry (*Rubus flagellaris*). Presently, the prairie is the subject of restoration activities. The FQI is 37.06 for the site, while the mean C is 3.60 (Table 1). Four species were encountered with a C greater than seven: Bicknell's sedge (*Carex bicknellii*), dark-scaled sedge (*Carex buxbaumii*), white prairie clover (*Dalea candida*), and rough white lettuce (*Prenanthes aspera*). Six adventive species were included in calculating the FQI. If these species are excluded from the calculations the FQI of the site is 38.20 and the mean C is 3.82. This community had the highest FQI and mean C at the MW. In general, an FQI greater than 35 tends to signify sites that are regionally noteworthy and sharply distinct from the predominant heavily degraded matrix areas in the landscape (Taft et al. 1997).

Cultural: This community accounted for 18.2 ha (8.6%) of the MWLWR (Figure 2). The cultural communities are created and maintained by human activity and were represented at the MWLWR by successional fields and developed lands (abandoned railroad right-of-way and road).

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Figure 1. Natural communities of Momence Wetlands Nature Preserve, Kankakee County, Illinois. (1) shrub swamp/marsh, (2) wet floodplain forest, and (3) wet-mesic floodplain forest. Total area is 29.2 ha (72 acres).

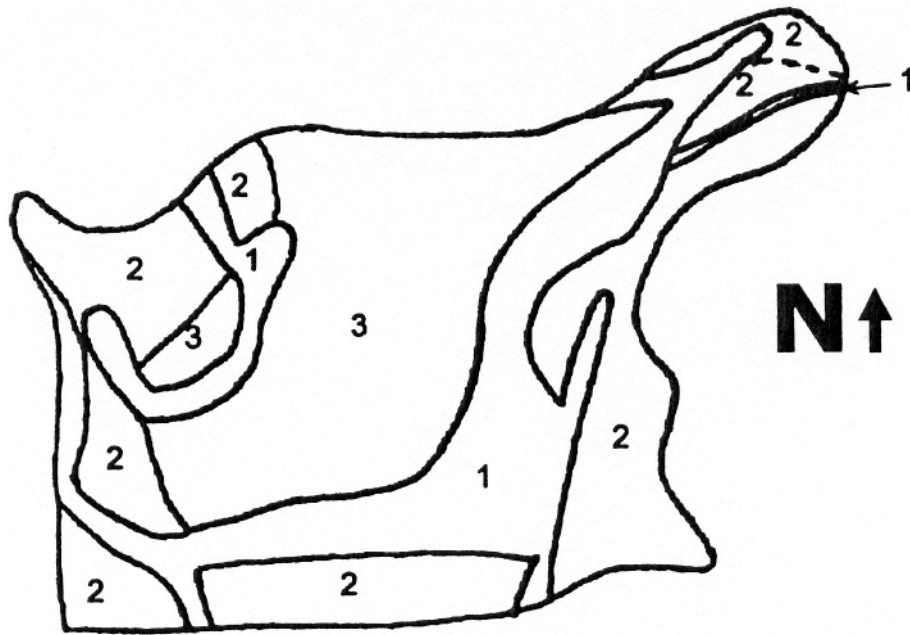


Figure 2. Natural communities of Proposed Mومence Land and Water Reserve, Kankakee County, Illinois. (1) shrub swamp/marsh, (2) wet floodplain forest, (3) wet-mesic floodplain forest, (4) dry-mesic upland forest, (5) wet-mesic prairie, and (6) cultural. Total area is 210.2 ha (519 acres).

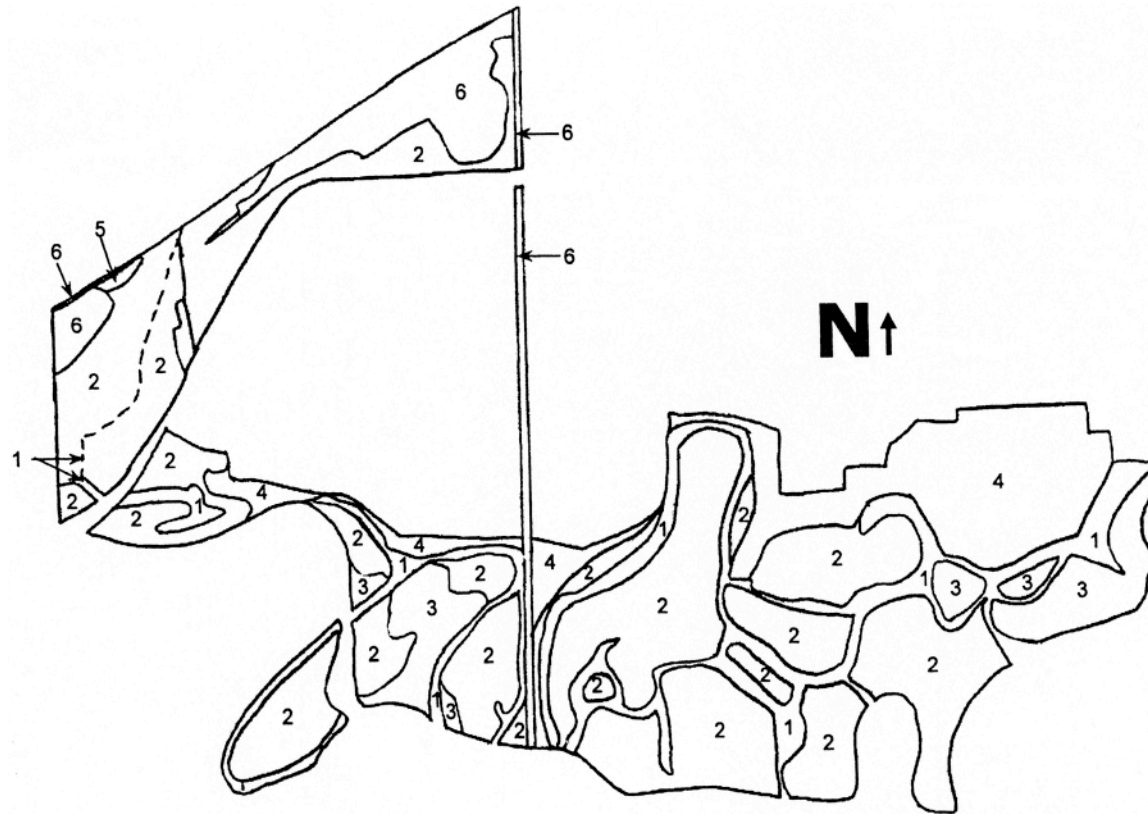


Table 1. Floristic quality assessment summary data comparing six natural communities (1 = shrub swamp/marsh; 2 = wet floodplain forest; 3= wet-mesic floodplain forest; 4 = dry-mesic upland forest; 5 = wet-mesic prairie) at Momence Wetlands, Kankakee County, Illinois.

Parameter	1	2	3	4	5
Total hectares	39.1	124.6	25.9	31.2	0.4
Total species richness	71	117	115	105	106
Native species richness	64	107	104	92	100
% Adventive species	9.9	8.6	9.6	12.4	5.7
Floristic Quality Index (FQI)	26.0	30.8	36.3	30.8	37.1
FQI (native)	27.36	32.17	38.14	32.90	38.20
Mean C (all species)	3.08	2.85	3.38	3.01	3.60
Mean C (native species)	3.42	3.11	3.74	3.43	3.82
Threatened species	0	0	1	0	0

Table 2. Density by diameter class (stems/ha), basal area (m²/ha), relative density, relative dominance, importance value, and average diameters of woody species recorded in three forest communities at the Momence Wetlands Land and Water Reserve and one forest community at the Momence Wetlands Nature Preserve, Kankakee County, Illinois.

Species	Diameter Classes (cm)							Total stems/ha	Basal Area (m ² /ha)	Rel.Den.	Rel.Dom.	I.V.	Av.Diam. (cm)
	10 - 19	20 - 29	30 - 39	40 - 49	50 - 59	60 - 70	70+						
Wet Floodplain Forest (MWLWR)													
<i>Acer saccharinum</i>	11	45	48	23	9	14	12	162	24.04	43.9	70.5	114.4	39.5
<i>Ulmus americana</i>	69	38	9	2	--	--	--	118	4.02	31.9	11.8	43.7	19.6
<i>Fraxinus pennsylvanica</i>	25	28	20	12	1	--	--	86	5.57	23.3	16.3	39.6	26.9
<i>Quercus bicolor</i>	--	--	--	--	1	--	--	1	0.26	0.3	0.8	1.1	57.5
<i>Populus deltoides</i>	--	--	--	1	--	--	--	1	0.16	0.3	0.5	0.8	44.5
<i>Betula nigra</i>	--	1	--	--	--	--	--	1	0.04	0.3	0.1	0.4	21.3
Totals	105	112	77	38	11	14	12	369	34.09	100.0	100.0	200.0	
Wet-mesic Floodplain Forest (MWNP)													
<i>Acer saccharinum</i>	68	30	19	9	4	4	7	141	11.94	36.2	39.0	75.2	27.2
<i>Quercus palustris</i>	13	22	18	13	9	4	3	82	9.95	21.2	32.5	53.7	35.7
<i>Fraxinus pennsylvanica</i>	23	27	11	3	--	--	--	64	3.28	16.7	10.7	27.4	23.9
<i>Quercus bicolor</i>	21	8	6	3	1	1	1	41	2.98	10.6	9.7	20.3	26.2
<i>Ulmus americana</i>	30	18	5	1	--	--	--	54	1.92	14.0	6.3	20.3	19.9
<i>Betula nigra</i>	1	1	2	--	--	--	--	4	0.34	1.0	1.1	2.1	31.0
<i>Gleditsia triacanthos</i>	--	--	--	1	--	--	--	1	0.10	0.2	0.3	0.5	44.5
<i>Populus deltoides</i>	--	--	--	--	--	--	--	--	0.13	0.1	0.4	0.5	73.0
Totals	156	106	61	30	14	9	11	387	30.64	100.0	100.0	200.0	
Wet-mesic Floodplain Forest (MWLWR)													
<i>Quercus bicolor</i>	13	13	11	14	8	5	4	68	9.62	20.1	36.2	56.3	38.2
<i>Quercus palustris</i>	23	21	16	11	4	2	1	78	6.83	23.0	25.7	48.7	30.1
<i>Ulmus americana</i>	32	26	7	2	2	--	--	69	3.06	20.4	11.5	31.9	21.9
<i>Fraxinus pennsylvanica</i>	41	14	10	3	--	--	--	68	2.59	20.1	9.8	29.9	19.9
<i>Acer saccharinum</i>	19	3	2	2	2	--	--	28	1.39	8.3	5.2	13.5	21.4
<i>Betula nigra</i>	1	--	3	2	4	--	--	10	1.53	2.9	5.8	8.7	42.4
<i>Quercus macrocarpa</i>	--	1	2	1	1	1	1	7	1.28	2.0	4.8	6.8	46.0
<i>Prunus serotina</i>	6	1	--	--	--	--	--	7	0.11	2.0	0.4	2.4	13.6
<i>Quercus rubra</i>	2	1	1	--	--	--	--	4	0.17	1.2	0.6	1.8	21.2
Totals	137	80	52	35	21	8	6	339	26.58	100.0	100.0	200.0	

Table 2. – continued.

Species	Diameter Classes (cm)							Total stems/ha	Basal Area (m ² /ha)	Rel.Den.	Rel.Dom.	I.V.	Av.Diam. (cm)
	10 - 19	20 - 29	30 - 39	40 - 49	50 - 59	60 - 70	70+						
Dry-mesic Upland Forest (MWLWR)													
<i>Quercus velutina</i>	--	1	18	40	24	5	2	90	16.33	35.7	73.3	109.0	47.2
<i>Quercus alba</i>	21	39	17	5	--	--	--	82	4.77	32.5	21.4	53.9	25.9
<i>Prunus serotina</i>	72	1	2	--	--	--	--	75	0.96	29.8	4.3	34.1	12.2
<i>Quercus rubra</i>	--	--	2	--	--	--	--	2	0.20	0.8	0.9	1.7	35.2
<i>Ulmus americana</i>	3	--	--	--	--	--	--	3	0.03	1.2	0.1	1.3	10.6
Totals	96	41	39	45	24	5	2	252	22.29	100.0	100.0	200.0	

Table 3. Densities (stems/ha) of woody seedlings (≤ 50 cm tall), small saplings (>50 cm tall <2.5 cm dbh), and large saplings (2.5 - 9.9 cm dbh) at three forest communities at the Momence Wetlands Land and Water Reserve and one forest community at the Momence Wetlands Nature Preserve, Kankakee County, Illinois.

Species	Seedlings ≤ 50 cm tall	Small Saplings >50 cm tall <2.5 cm dbh	Large Saplings 2.5 - 9.9 cm dbh
<i>Fraxinus pennsylvanica</i>	67,000	--	25
<i>Ulmus americana</i>	15,600	--	30
<i>Acer saccharinum</i>	14,400	--	15
<i>Quercus palustris</i>	100	--	--
<i>Morus alba</i>	--	50	--
<i>Cephalanthus occidentalis</i>	--	50	--
Totals	97,100	100	70
Wet-mesic Floodplain Forest (MWNP)			
<i>Ulmus americana</i>	720,000	--	28
<i>Fraxinus pennsylvanica</i>	324,500	50	10
<i>Acer saccharinum</i>	177,500	50	113
<i>Quercus palustris</i>	500	--	--
<i>Morus alba</i>	500	--	--
<i>Cephalanthus occidentalis</i>	8,000	25	--
Totals	1,231,000	125	151
Wet-mesic Floodplain Forest (MWLWR)			
<i>Fraxinus pennsylvanica</i>	21,700	800	205
<i>Ulmus americana</i>	9,500	50	70
<i>Acer saccharinum</i>	700	--	60
<i>Sassafras albidum</i>	100	--	5
<i>Prunus serotina</i>	--	--	30
<i>Quercus palustris</i>	--	--	30
<i>Betula nigra</i>	--	--	5
<i>Quercus bicolor</i>	--	--	5
<i>Lindera benzoin</i>	41,700	1,400	--
<i>Cornus obliqua</i>	1,600	--	--
Other shrubs	900	700	--
Totals	76,200	2,950	410
Dry-mesic Upland Forest (MWLWR)			
<i>Quercus velutina</i>	13,100	500	5
<i>Fraxinus pennsylvanica</i>	8,600	400	15
<i>Prunus serotina</i>	2,800	1,500	2,070
<i>Quercus alba</i>	900	--	--
<i>Ulmus americana</i>	700	100	55
<i>Acer saccharinum</i>	400	--	--
<i>Sassafras albidum</i>	100	450	15
<i>Carya ovata</i>	100	--	5
Other trees	--	150	15
<i>Ribes missouriense</i>	800	--	--
<i>Viburnum acerifolium</i>	500	--	--
<i>Berberis thunbergii</i>	200	--	--
Totals	28,200	3,100	2,180

Table 4. Density, basal area, and average diameter of the dead-standing tree species encountered in the wet-mesic floodplain forest at Momence Wetlands Nature Preserve, Kankakee County, Illinois.

Species	Density (stems/ha)	Basal Area (m ² /ha)	Avg. Diameter (cm)
<i>Ulmus americana</i>	23.0	1.30	23.7
<i>Quercus palustris</i>	12.2	1.28	31.4
<i>Acer saccharinum</i>	10.6	1.32	33.3
<i>Fraxinus pennsylvanica</i>	4.5	0.09	15.1
<i>Betula nigra</i>	4.2	0.40	34.1
<i>Quercus bicolor</i>	2.0	0.07	18.1
Totals	56.5	4.46	

Table 5. Frequency (%), average cover, relative frequency, relative cover, and importance value of the ground layer species encountered in a prairie remnant in the late summer of 1998 at the Momence Wetlands Land and Water Reserve, Kankakee County, Illinois.

Species	Frequency (%)	Average Cover	Relative Frequency	Relative Cover	Importance Value
<i>Rubus flagellaris</i>	44.0	25.32	12.0	17.9	29.9
<i>Helianthus mollis</i>	38.0	26.40	10.3	18.6	28.9
<i>Andropogon gerardii</i>	34.0	19.32	9.3	13.6	22.9
<i>Solidago canadensis</i>	32.0	17.16	8.7	12.1	20.8
<i>Poa pratensis</i>	38.0	3.12	10.3	2.2	12.5
<i>Solidago rigida</i>	16.0	11.40	4.5	8.0	12.5
<i>Aster ericoides</i>	28.0	5.64	7.6	4.0	11.6
<i>Sorghastrum nutans</i>	16.0	8.64	4.5	6.0	10.5
<i>Salix humilis</i>	10.0	6.00	2.7	4.2	6.9
<i>Rosa carolina</i>	16.0	2.68	4.5	1.8	6.3
<i>Eryngium yuccifolium</i>	6.0	3.60	1.6	2.5	4.1
<i>Euthamia graminifolia</i>	12.0	1.04	3.3	0.7	4.0
<i>Spartina pectinata</i>	6.0	2.64	1.6	1.8	3.4
<i>Potentilla simplex</i>	8.0	1.32	2.2	0.9	3.1
<i>Galium obtusum</i>	10.0	0.20	2.7	0.1	2.8
<i>Lactuca canadensis</i>	6.0	1.48	1.6	1.0	2.6
<i>Spiraea alba</i>	6.0	1.48	1.6	1.0	2.6
<i>Carex spp.</i>	8.0	0.16	2.2	0.1	2.3
<i>Euphorbia corollata</i>	6.0	0.72	1.6	0.5	2.1
<i>Hypericum sphaerocarpaceum</i>	4.0	1.44	1.1	1.0	2.1
<i>Ulmus americana</i>	2.0	1.20	0.5	0.8	1.3
<i>Elymus canadensis</i>	4.0	0.08	1.1	0.1	1.2
<i>Solidago nemoralis</i>	2.0	0.24	0.5	0.2	0.7
<i>Rudbeckia subtomentosa</i>	2.0	0.24	0.5	0.2	0.7
<i>Antennaria plantaginifolia</i>	2.0	0.04	0.5	0.1	0.6
<i>Achillea millefolium</i>	2.0	0.04	0.5	0.1	0.6
<i>Cassia fasciculata</i>	2.0	0.04	0.5	0.1	0.6
<i>Prunus serotina</i>	2.0	0.04	0.5	0.1	0.6
<i>Cirsium discolor</i>	2.0	0.04	0.5	0.1	0.6
<i>Muhlenbergia frondosa</i>	2.0	0.04	0.5	0.1	0.6
<i>Physostegia virginiana</i>	2.0	0.04	0.5	0.1	0.6
Totals		141.80	100.0	100.0	200.0

APPENDIX 1

The vascular taxa encountered and collected at the Momence Wetlands are listed below by major groups, Pteridophytes (ferns and fern-allies) and Spermatophytes (seed plants), the latter divided into Monocots and Dicots. The families, genera, and species are alphabetically arranged within each group. Non-native species are indicated by an asterisk (*). After the binomial and authority, the communities where the species was observed is given (1 = shrub swamp/marsh, 2 = wet floodplain forest, 3 = wet-mesic floodplain forest, 4 = dry-mesic upland forest, 5 = wet-mesic prairie, 6 = cultural). Following the community number(s), collecting numbers preceded by the initial of the collector's name are given (P for Loy R. Phillippe, H for Fran Harty).

PTERIDOPHYTES

DRYOPTERIDACEAE

Onoclea sensibilis L.: 3; P 30042

EQUISETACEAE

Equisetum arvense L.: 6; P 30395

OPHIOGLOSSACEAE

Botrychium dissectum Spreng.: 4, 5, 6; P 29958

OSMUNDACEAE

Osmunda regalis L.: 3; P 30041

SALVINIACEAE

Azolla caroliniana Willd.: 1, 2; P 29928

THELYPTERIDACEAE

Thelypteris palustris Schott var. *pubescens* (Lawson) Fernald: 3; P 30960

SPERMATOPHYTES: ANGIOSPERMS

MONOCOTS

ALISMACEAE

Alisma plantago-aquatica L. var. *parviflorum* (Pursh) Torrey: 1, 2; P 29907

Sagittaria brevirostrata Mack. & Bush: 1, 2; P 30968

Sagittaria latifolia Willd.: 1, 2; P 30050

ARACEAE

Arisaema dracontium (L.) Schott: 3; P 30373

COMMELINACEAE

**Commelina communis* L.: 4; P 30030

Tradescantia ohiensis Raf.: 5, 6; P 29996

CYPERACEAE

Carex bicknellii Britton: 5; P 30337

Carex blanda Dewey: 3, 4; P 30369

Carex buxbaumii Wahlenb.: 5; P 30348

Carex cephalophora Muhl. ex. Willd.: 4; P 30367

Carex festucacea Schk. in Willd.: 4; P 30409

Carex lupulina Willd.: 2, 3, 4; P 30089

Carex muskingumensis Schwein.: 2, 3, 4; P 30037

Carex normalis Mackenzie: 3, 4; P 30143

Carex pellita Muhl.: 5; P 30339

Carex pennsylvanica Lam.: 4; P 30159

Carex radiata (Wahlenb.) Small: 3, 4; P 30375

Carex sartwellii Dewey: 6; P 30352

Carex stipata Muhl. in Willd.: 6; P 30390

Carex stricta Lam.: 5, 6; P 30351

Carex swanii (Fernald) Mackenzie: 4; P 30407

Carex tribuloides Wahlenb.: 4; 30017

Carex typhina Michaux: 3, 4; P 30015

Cyperus aristatus Rottb.: 1; P 29882

Cyperus erythrorhizos Muhl.: 1, 2; P 30053

Cyperus ferruginescens Boeckl.: 1, 2, 3; P 29880

Cyperus strigosus L.: 5, 6; P 31246

Eleocharis acicularis (L.) Roem. & Schultes: 1, 2; P 30969

Eleocharis elliptica Kunth var. *compressa* (Sull.) Drap. & Mohlenbrock: 5; P 30349

Eleocharis obtusa (Willd.) Schult. var. *obtusa*: 1, 2; P 29883

Hemicarpha micrantha (Vahl) Pax: 1; P 29881

Scirpus cyperinus (L.) Kunth: 6; P 31250

DIOSCOREACEAE

Dioscorea villosa L.: 3, 4, 6; P 30120

IRIDACEAE

Iris shrevei Small: 3; P 31228
Sisyrinchium albidum Raf.: 5; P 30347

JUNCACEAE

Juncus tenuis Willd.: 4, 5; P 30966

LEMNACEAE

Lemna minor L.: 1; P 31012

LILIACEAE

Allium canadense L.: 4, 5, 6; P 30345
Hypoxis hirsuta (L.) Coville: 5; P 30350
 **Ornithogalum umbellatum* L.: 6; P 30382
Polygonatum biflorum (Walt.) Ell.: 4; P 30405

POACEAE

**Agrostis alba* L.: 2, 5, 6; P 31008
Agrostis hyemalis (Walt.) BSP.: 6; site record only
Agrostis perennans (Walt.) Tuckerm.: 4; P 30020
Andropogon gerardii Vitman: 5, 6; P 29977
Andropogon virginicus L.: 6; P 30136
 **Bromus tectorum* L.: 6; P 30357
Calamagrostis canadensis (Michaux) Beauv.: 6; P 30990
Cinna arundinacea L.: 2, 3, 4; P 30036
 **Dactylis glomerata* L.: 4, 6; P 30404
 **Digitaria ischaemum* (Schreb.) Muhl.: 3; P 30116
 **Digitaria sanguinalis* (L.) Scop.: 3; P 30142
Echinochloa muricata (P. Beauv.) Fernald var. *muricata*: 1, 2, 6; P 30054
Elymus canadensis L.: 5; P 30001
Elymus virginicus L.: 2, 3, 4, 5, 6; P 30007
Eragrostis hypnoides (Lam.) BSP.: 1, 2; P 29912
Eragrostis pectinacea (Michaux) Nees: 1, 2; P 30983
Eragrostis spectabilis (Pursh) Steud.: 5; P 29986
Festuca obtusa Biehler: 4; P 30363
Glyceria striata (Lam.) Hitchcock: 1, 2, 3, 6; P 30401
Leersia lenticularis Michaux: 2, 3; P 29924
Leersia oryzoides (L.) Swartz: 1, 2; P 29909
Leersia virginica Willd.: 1, 2, 3, 4, 6; P 29923
Leptoloma cognatum (Schult.) Chase: 6; P 30131
Muhlenbergia frondosa (Poir.) Fernald f. *frondosa*: 2, 4; P 30055
Muhlenbergia mexicana (L.) Trin. f. *mexicana*: 5, 6; P 29965

Muhlenbergia schreberi Gmel.: 4; P 30026
Panicum capillare L. var. *capillare*: 2; P 31362
Panicum clandestinum L.: 4, 6; P 30961
Panicum dichotomiflorum Michaux: 1, 2, 3, 6; P 29915
Panicum lanuginosum Elliott var. *fasciculatum* (Torrey) Fernald: 4, 5 6; P 29978
Panicum lanuginosum Elliott var. *lindheimeri* (Nash) Fernald: 5, 6; P 29971
Panicum latifolium L.: 4; P 30092
Panicum virgatum L.: 5, 6; P 29974
Phalaris arundinacea L.: 2, 3, 6; P 30978
 **Poa annua* L.: 6; P 30154
 **Poa pratensis* L.: 4, 5, 6; P 30341
Schizachyrium scoparium (Michaux) Nash: 5; P 29992
Setaria geniculata (Lam.) Beauv.: 5; P 31006
Sorghastrum nutans (L.) Nash: 5, 6; P 30011
Spartina pectinata Link: 5; P 29991
Sphenopholis obtusata (Michaux) Scribner var. *major* (Torrey) Erdman: 4, 6; P 30368
Sporobolus asper (Michaux) Kunth: 6; P 30137
Stipa spartea Trin.: 5; P 31005-B
Tridens flavus (L.) Hitchcock: 6; P 30122

POTAMOGETONACEAE

**Potamogeton crispus* L.: 1; P 30046

SMILACACEAE

Smilax ecirrhata Kunth: 2, 3; P 30399
Smilax hispida Muhl.: 3, 4; P 30039

SPARGANIACEAE

Sparganium sp.: 1; site record only

DICOTS

ACERACEAE

Acer negundo L.: 6; P 30167
Acer saccharinum L.: 1, 2, 3, 4, 6; P 30152

AMARANTHACEAE

Amaranthus rudis Sauer: 1, 2, 3; P 29878

ANACARDIACEAE

Toxicodendron radicans (L.) Kuntze: 2, 3, 4, 6; P 30985

APIACEAE

Cicuta maculata L.: 5; P 30995

Cryptotaenia canadensis (L.) DC.: 6; P 30986
 **Daucus carota* L.: 5, 6; P 29985
Eryngium yuccifolium Michaux: 5, 6; P 29959
Osmorhiza claytonii (Michaux) Clarke: 4, 6; P 30408
 **Pastinaca sativa* L.: 6; P 30379
Sanicula canadensis L.: 4, 6; P 30964
Sium suave Barbin.: 1, 2; P 29946
Thaspium barbinode (Michaux) Nuttall: 6; P 30387
 **Torilis japonica* (Houtt.) DC.: 4, 6; P 30965

APOCYNACEAE

Apocynum cannabinum L.: 4; P 31230

AQUIFOLIACEAE

Ilex verticillata (L.) Gray: 3; P 29937

ASCLEPIADACEAE

Asclepias incarnata L.: 1, 2, 3, 5; P 29932
Asclepias syriaca L.: 6; site record only

ASTERACEAE

**Achillea millefolium* L.: 5, 6; P 31010
Ambrosia artemisiifolia L.: 5, 6; P 31266
Ambrosia trifida L.: 2, 5, 6; P 30013
Antennaria plantaginifolia (L.) Richardson: 4, 5; P 30371
 **Arctium lappula* L.: 6; P 31245
 **Arctium minus* Bernh.: 2, 6; site record only
Aster drummondii Lindley in Hooker: 5; P 29981
Aster dumosus L.: 2, 4; P 30102-A
Aster ericoides L.: 5; P 30012
Aster lanceolatus Willd.: 1, 2, 3, 5, 6; P 29893
Aster ontarionis Wieg.: 1, 2, 4; P 30087
Aster pilosus Willd.: 5, 6; P 29955
Aster urophyllus Lindley in DC.: 4; P 30019
Bidens aristosa (Michaux) Britton: 2, 3, 5, 6; P 29917
Bidens cernua L.: 1, 2; P 29910
Bidens frondosa L.: 1, 2, 3; P 29918
Bidens vulgata Greene: 1, 2, 3; P 31274
 **Centaurea maculosa* Lam.: 6; P 30989
 **Cirsium arvense* (L.) Scop.: 6; site record only
Cirsium discolor (Muhl.) Spreng.: 5, 6; P 31253
Conyza canadensis (L.) Cronquist: 6; P 31252
Eclipta prostrata (L.) L.: 1, 2; P 29914

Erechtites hieracifolia (L.) Raf.: 2, 3; P 29890
Erigeron annuus (L.) Pers.: 4, 6; P 31238
Eupatorium altissimum L.: 6; P 30125
Eupatorium maculatum L.: 2, 3; P 29887
Eupatorium perfoliatum L.: 2; P 30106
Eupatorium rugosum Houtt.: 4; P 30033
Eupatorium serotinum Michaux: 1, 2, 3, 4, 5, 6; P 29921
Euthamia graminifolia (L.) Nutt.: 5, 6; P 29966
Gnaphalium obtusifolium L.: 6; P 30123
Helenium autumnale L.: 5, 6; P 30005
Helianthus grosseserratus Martens: 5, 6; P 29968
Helianthus mollis Lam.: 5; P 30003
Helianthus strumosus L.: 6; P 30980
Heliopsis helianthoides (L.) Sweet: 6; P 30133
Krigia biflora (Walt.) Blake: 4; P 30362
Lactuca biennis (Moench) Fernald: 2, 6; P 31241
Lactuca canadensis L.: 5, 6; P 29953
Liatris spicata (L.) Willd.: 5; P 30004
Mikania scandens (L.) Willd.: 1, 2, 3; P 29916
Prenanthes altissima L.: 4; P 30021
Prenanthes aspera Michaux: 5; P 29987
Ratibida pinnata (Vent.) Barnh.: 5; P 30999
Rudbeckia hirta L.: 5; P 31011
Rudbeckia laciniata L.: 2; P 31239
Rudbeckia subtomentosa Pursh: 5, 6; P 29954
Senecio glabellus Poir.: 2, 6; P 30377
Solidago canadensis L.: 5, 6; P 29967
Solidago caesia L.: 4; P 30090
Solidago gigantea Aiton: 2, 6; P 30104
Solidago nemoralis Aiton: 5; P 29984
Solidago rigida L.: 5; P 29999
Solidago ulmifolia Muhl.: 4; P 30024
 **Sonchus arvensis* L.: 6; P 30993
 **Taraxacum officinale* Weber: 6; P 30169
 **Tragopogon dubius* Scop.: 6; P 30355
Vernonia fasciculata Michaux: 6; P 30008
Xanthium strumarium L. var. *glabratum* (DC.) Cronq.: 2; P 30048

BALSAMINACEAE

Impatiens capensis Meerb.: 1, 2, 3, 4, 6; P 30982

BERBERIDACEAE

**Berberis thunbergii* DC.: 3, 4, 6; P 30025

BETULACEAE

Betula nigra L.: 1, 2, 3; P 30062

BIGNONIACEAE

- Campsis radicans* (L.) Seem: 2, 3, 4, 6; P 30972
Catalpa speciosa Warder: 2, 4, 6; P 30144

BORAGINACEAE

- Hackelia virginiana* (L.) I.M. Johnston: 4, 6; P 30963
 **Myosotis scorpioides* L.: 1; P 30098
Myosotis verna Nutt.: 6; P 30388

BRASSICACEAE

- **Alliaria petiolata* (Bieb.) Cavara & Grande: 4; P 30360
 **Barbarea vulgaris* R. Br.: 6; P 30354-B
Cardamine bulbosa (Schrab.) BSP.: 3; P 30376
Cardamine pensylvanica Muhl.: 3, 5, 6; P 30045
Descurainia pinnata (Walt.) Britton: 6; P 30385
 **Erysimum inconspicuum* (S. Wats.) MacM.: 6; P 30359
 **Lepidium campestre* (L.) R. Br.: 6; P 30356
 **Nasturtium officinale* R. Br.: 1, 2; P 30397
Rorippa islandica (Oeder) Borbas var. *fernaldiana* Butt. & Abbe: 2; P 29904
Rorippa sessiliflora (Nutt.) Hitchc.: 2; P 29884
 **Rorippa sylvestris* (L.) Besser: 1, 2; P 30984
Sibara virginica (L.) Rollins: 6; P 30157

CAESALPINIACEAE

- Cassia fasciculata* Michaux: 5, 6; P 30010
Gleditsia triacanthos L.: 3; P 30150

CAMPANULACEAE

- Campanula americana* L.: 6; P 30103
Lobelia cardinalis L.: 1, 2, 3; P 29941

CAPRIFOLIACEAE

- **Lonicera x bella* Zabel: 4; P 30365
 **Lonicera maackii* (Rupr.) Maxim.: 4, 6; P 30093
Sambucus canadensis L.: 4, 6; P 31240
Viburnum acerifolium L.: 3, 4; P 29938
 **Viburnum lantana* L.: 5; P 29994

CARYOPHYLLACEAE

- **Arenaria serpyllifolia* L.: 6; P 30383
Cerastium nutans Raf.: 6; P 30392
 **Cerastium vulgatum* L.: 6; P 30353
 **Lychnis alba* Mill: 6; P 29950
Moehringia lateriflora (L.) Fenzl.: 4; P 30366

- **Myosoton aquaticum* (L.) Moench.: 1; P 30107
Paronychia canadensis (L.) Wood: 4; P 31229
 **Saponaria officinalis* L.: 6; P 30130
Silene antirrhina L.: 6; P 30384
Silene stellata (L.) Aiton f.: 4; P 30022
 **Stellaria media* (L.) Vill.: 6; P 30155

CELASTRACEAE

- Celastrus scandens* L.: 4; P 30410
Euonymus atropurpurea Jacq.: 3; P 30040

CHENOPODIACEAE

- Chenopodium standleyanum* Aellen: 4; P 30032

CLUSIACEAE

- Hypericum sphaerocarpum* Michaux: 5, 6; 29962

CONVOLVULACEAE

- Calystegia sepium* (L.) R. Br.: 2, 3, 5, 6; P 31001

CORNACEAE

- Cornus obliqua* Raf.: 2, 3, 4, 5, 6; P 30086
Cornus racemosa Lam.: 6; P 31248

CUCURBITACEAE

- Echinocystis lobata* (Michaux) Torrey & Gray: 2, 3; P 29889
Sicyos angulatus L.: 1, 2, 3; P 30044

CUSCUTACEAE

- Cuscuta gronovii* Willd.: 1, 2, 3; P 29949

ELAEAGNACEAE

- **Elaeagnus umbellata* Thunb.: 4; P 30099

EUPHORBIACEAE

- Acalypha gracilens* Gray var. *gracilens*: 6; P 30134
Acalypha rhomboidea Raf.: 2, 3, 4, 6; P 29934
Euphorbia corollata L.: 5; P 31009
Poinsettia dentata (Michaux) Kl. & Garcke: 6; P 30124

FABACEAE

- Amorpha fruticosa* L.: 4; P 30083
Apios americana Medicus: 5; P 30996
Baptisia lactea (Raf.) Thieret: 5; P 29990
Dalea candida (Michaux) Willd.: 5; P 29989
Desmodium glabellum (Michaux) DC.: 5, 6; P 29960

Desmodium illinoense Gray: 5; P 29998
Desmodium nudiflorum (L.) DC.: 4; P 30016
Lathyrus palustris L.: 5; P 29983
Lespedeza capitata Michaux: 5; P 30000
 **Melilotus alba* Medicus: 5, 6; P 31002

FAGACEAE

Quercus alba L.: 4; P 31237
Quercus bicolor Willd.: 2, 3; P 29935
Quercus macrocarpa Michaux: 3; P 31269
Quercus palustris Muenchh.: 1, 2, 3; P 30082
Quercus rubra Lam.: 4; P 31233
Quercus velutina Lam.: 4; P 30095

GENTIANACEAE

Gentiana andrewsii Griseb.: 5, 6; P 29969

GERANIACEAE

Geranium carolinianum L.: 6; P 30358
Geranium maculatum L.: 3, 4; P 30370

GROSSULARIACEAE

Ribes americana Mill.: 3, 6; P 30153
Ribes missouriense Nutt.: 3, 4; P 30161

JUGLANDACEAE

Carya ovata (Mill.) K. Koch: 3, 4; P 31232

LAMIACEAE

**Glechoma hederacea* L.: 4, 6; P 30170
 **Leonurus cardiaca* L.: 6; P 31244
Lycopus americanus Muhl.: 3, 5; P 29885
Lycopus rubellus Moench.: 3; P 29886
Lycopus uniflorus Michaux: 1, 2, 3; P 30077
Lycopus virginicus L.: 3; P 31267
Mentha arvensis L. var. *villosa* (Benth.) S.R. Stewart: 1, 6; P 31000
Mimulus ringens L.: 2; P 29903
 **Nepetea cataria* L.: 6; P 30139
Physostegia speciosa (Sweet) Sweet: 2, 3, 5; P 29945
Physostegia virginiana (L.) Benth.: 1, 2, 3, 5; P 29896
Prunella vulgaris L.: 4, 5, 6; P 29957
Pycnanthemum pilosum Nutt.: 5; P 31007
Pycnanthemum tenuifolium Schrad.: 5; P 29997
Scutellaria lateriflora L.: 1, 2, 3; P 29901
Stachys tenuifolia Willd. var. *hispida* (Pursh) Fernald: 2, 3, 5, 6; P 30014
Stachys tenuifolia Willd. var. *tenuifolia*: 2, 6; P 29900
Teucrium canadense L.: 3, 6; P 30038

LAURACEAE

Lindera benzoin (L.) Blume: 3, 4; P 29940

Sassafras albidum (Nutt.) Nees: 3, 4; P 30075

LYTHRACEAE

Ammannia coccinea Rottb.: 3; P 29891
Lythrum alatum Pursh: 5; P 31004
 **Lythrum salicaria* L.: 1; P 29888
Rotala ramosior (L.) Koehne: 1, 2; P 29908

MALVACEAE

Hibiscus laevis All.: 1, 2; P 29931

MENISPERMACEAE

Menispermum canadense L.: 2, 3; P 30374

MORACEAE

**Morus alba* L.: 2, 3, 4, 6; P 30132

NYCTAGINACEAE

**Mirabilis nyctaginea* (Michaux) MacM.: 6; P 29951

OLEACEAE

Fraxinus pennsylvanica Marsh.: 1, 2, 3; P 29930
Fraxinus profunda (Bush) Bush: 1; H s.n.

ONAGRACEAE

Gaura biennis L.: 6; P 31251
Ludwigia palustris (L.) Ell.: 1, 2; P 29898
Oenothera biennis L.: 5, 6; P 29982
Oenothera pilosella Raf.: 5; P 30997

OXALIDACEAE

Oxalis dillenii Jacq.: 2, 3, 6; P 30126
Oxalis stricta L.: 3, 4, 6; P 30018
Oxalis violacea L.: 5; P 30344

PHYTOLACCACEAE

Phytolacca americana L.: 1, 2, 3, 4, 6; P 30034

PLANTAGINACEAE

**Plantago major* L.: 3; P 29895
Plantago rugelii Decne.: 6; P 30987
Plantago virginica L.: 6; P 30389

POLEMONIACEAE

Phlox paniculata L.: 6; P 31243

POLYGALACEAE

Polygala sanguinea L.: 5; P 30002

POLYGONACEAE

Polygonum amphibium L.: 1, 2, 3, 6; site record only
Polygonum bicornis Raf.: 3; P 30114

**Polygonum cespitosum* Blume var.
longisetum (De Bruyn) Stewart: 2, 3, 4, 6;
 P 30029
Polygonum hydropiperoides Michaux: 1, 2;
 P 29927
Polygonum lapathifolium L.: 1; site record
 only
Polygonum pensylvanicum L.: 3; P 29922
 **Polygonum persicaria* L.: 2, 3; P 29925
Polygonum punctatum Ell.: 1, 2, 3, 5, 6; P
 29902
Polygonum scandens L.: 4, 5, 6; P 30031
Polygonum virginianum L.: 2, 3, 4, 6; P
 30023
 **Rumex acetosella* L.: 6; P 30386
Rumex altissimus Wood: 6; P 30994
 **Rumex crispus* L.: 2; P 30977
Rumex verticillatus L.: 1, 2; P 29929

PORTULACACEAE

Claytonia virginica L.: 4, 5, 6; P 30168

PRIMULACEAE

Lysimachia ciliata L.: 3; P 30962
Lysimachia hybrida Michaux: 3; P 31255
Lysimachia lanceolata Walt.: 4, 5; P 31003
 **Lysimachia nummularia* L.: 1, 2, 3, 6; P
 30068
Samolus valerandii L.: 1; P 30975

PYROLACEAE

Monotropa uniflora L.: 3; P 31266

RANUNCULACEAE

Anemone canadensis L.: 5, 6; P 30340
Anemone virginiana L.: 6; P 30988
Anemonella thalictroides (L.) Spach.: 4; P
 30158
Clematis pitcheri Torrey & Gray: 3; P
 30080
Myosurus minimus L.: 6; P 30156
Ranunculus abortivus L.: 5, 6; P 30165
Ranunculus sceleratus L.: 1, 2; P 29905
Ranunculus septentrionalis Poir.: 3; P 30163
Thalictrum revolutum DC.: 5; P 29980

RHAMNACEAE

**Rhamnus cathartica* L.: 3; P 30121

ROSACEAE

Crataegus cuneiformis (Marsh.) Egglest.: 3;
 P 30083
Crataegus mollis (Torrey & Gray) Scheele:
 2, 3; P 30100
Fragaria virginiana Duchesne: 3, 6; P
 30381
Geum canadense Jacq.: 4, 6; P 30035

Geum laciniatum Murr.: 5, 6; P 29970
Geum vernum (Raf.) Torrey & Gray: 6; P
 30393
Malus ioensis (Wood) Britton: 3; P 30402
Potentilla norvegica L.: 2, 6; P 30135
Potentilla simplex Michaux: 4, 5; P 30338
Prunus serotina Ehrh.: 3, 4, 5, 6; P 31234
Rosa carolina L.: 5, 6; P 29952
 **Rosa multiflora* Thunb.: 4, 5, 6; P 29963
Rosa setigera Michaux: 2, 3, 6; P 31265
Rubus allegheniensis Porter: 4; P 31236
Rubus flagellaris Willd.: 2, 4, 5, 6; P 31235
Rubus occidentalis L.: 2, 3, 4, 6; P 30971
Rubus pensilvanicus Poir.: 2, 3, 4, 6; P
 30372
Spiraea alba Du Roi: 5; P 29988

RUBIACEAE

Cephalanthus occidentalis L.: 1, 2, 3; P
 30058
Galium aparine L.: 4, 6; site record only
Galium obtusum Bigel.: 4, 5, 6; P 30009
Galium triflorum Michaux: 4; P 30028
Hedyotis caerulea (L.) Hook.: 5; P 30342

RUTACEAE

Zanthoxylum americanum Mill.: 3, 4; P
 30084

SALICACEAE

Populus deltoides Marsh.: 1, 2, 6; P 30378
Populus heterophylla L.: 1; P 29939
Salix exigua Nutt.: 2, 6; P 30105
Salix humilis Marsh.: 5; P 29993
Salix nigra Marsh.: 1, 2; P 30047
Salix rigida Muhl.: 6; P 30118

SAURURACEAE

Saururus cernuus L.: 1, 2, 3; P 30052

SAXIFRAGACEAE

Penthorum sedoides L.: 1, 2; P 29920

SCROPHULARIACEAE

Gratiola neglecta Torrey: 2, 6; P 30147
 **Linaria vulgaris* Hill: 6; P 30127
Lindernia dubia (L.) Pennell var.
anagallidea (Michaux) Cooperrider: 1, 2;
 P 29913
Mimulus ringens L.: 1, 2, P 29903
 **Verbascum thapsus* L.: 6; P 30992
 **Veronica arvensis* L.: 6; P 30354-A
Veronica catenata Pennell: 1, 2; P 30056
Veronicastrum virginicum (L.) Farw.: 5, 6; P
 29975

SOLANACEAE

- Physalis heterophylla* Nees: 5, 6; P 30129
Solanum carolinense L.: 5, 6; P 29972
 **Solanum dulcamara* L.: 2, 3; P 29892
Solanum ptycanthum Dunal: 2, 3; P 29911

STYRACACEAE

- Styrax americana* Lam.: 3; P 29936

ULMACEAE

- Celtis occidentalis* L.: 3; P 30081
Ulmus americana L.: 2, 3, 4, 6; P 30057
Ulmus rubra Muhl.: 3, 4; P 30074

URTICACEAE

- Boehmeria cylindrica* (L.) Sw.: 2, 3, 5, 6; P 29897
Laportea canadensis (L.) Wedd.: 2, 3; P 30079
Parietaria pensylvanica Muhl.: 3; site record only

- Pilea pumila* (L.) Gray: 1, 2, 3; P 29899
Urtica dioica L.: 2, 4; P 30027

VERBENACEAE

- Phyla lanceolata* (Michaux) Greene: 1, 2; P 29919
Verbena hastata L.: 6; P 29956
Verbena stricta Vent.: 6; P 30128
Verbena urticifolia L.: 6; P 30981

VIOLACEAE

- Viola pratensis* Greene: 3, 6; P 30076
Viola sagittata Aiton: 4, 5; P 30343

VITACEAE

- Parthenocissus quinquefolia* (L.) Planch.: 3, 4, 6; P 31231
Vitis riparia Michaux: 2, 3, 4, 5, 6; P 29961