



I L L I N O I S

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

**PRODUCTION NOTE**

University of Illinois at  
Urbana-Champaign Library  
Large-scale Digitization Project, 2007.



INHS  
B10:0  
1999 (26)

Natural History Survey  
Library

**VASCULAR FLORA OF MOMENCE WETLANDS,  
KANKAKEE COUNTY, ILLINOIS**

Loy R. Phillippe<sup>1</sup>, William C. Handel<sup>1</sup>, Shannon Horn<sup>2</sup> and John E. Ebinger<sup>1</sup>

<sup>1</sup>Illinois Natural History Survey, 607 East Peabody Drive,  
Champaign, Illinois 61820.

<sup>2</sup>Division of Natural Heritage, Illinois State University, Campus Box 4120,  
Normal, Illinois 61790-4120.

Illinois Natural History Survey  
Center for Biodiversity  
Technical Report 1999 (26)

Prepared for:

Illinois Department of Natural Resources  
Division of Natural Heritage  
600 North Grand Avenue West  
Springfield, Illinois 62701

Project Completion  
31 December 1999



## 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 Asteraceae with 59 taxa, Poaceae with 44 taxa, and Cyperaceae with 26 taxa, of which 17 were members of the genus *Carex*. This is the northern most location in Illinois for four taxa generally associated with swamps in southern Illinois, *Populus heterophylla* L. (swamp cottonwood), *Fraxinus profunda* (Bush) Bush (pumpkin ash), *Mikania scandens* (L.) Willd. (climbing hempweed), and the state threatened *Styrax americana* Lam. (American storax). Three forest communities (wet floodplain, wet-mesic floodplain, dry-mesic upland) were surveyed, and density (stems/ha), basal area (m<sup>2</sup>/ha), importance value, and average diameter were determined for each overstory species. Wet floodplain forest was dominated by *Acer saccharinum* L. (silver maple); wet-mesic floodplain forest by *Quercus bicolor* Willd. (swamp white oak), *Quercus palustris* Muenchh. (pin oak), *Ulmus americana* L. (American elm), and *Fraxinus pennsylvanica* Marsh. (red/green ash); and dry-mesic upland forest by *Quercus velutina* Lam. (black oak) and *Quercus alba* L. (white oak). A wet-mesic prairie remnant dominated by *Rubus flagellaris* Willd. (Northern dewberry), *Helianthus mollis* Lam. (downy sunflower), *Andropogon gerardii* Vitman (big bluestem), and *Solidago canadensis* L. (tall goldenrod) was also surveyed.

## INTRODUCTION

Momence Wetlands (MW) study area is comprised 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 ac) in size, contains the best remaining example of wet-mesic floodplain forest in the Kankakee River drainage. MWLWR, 210.2 ha (519 ac) in size, is located in and along the Kankakee River about 1.5 mile west of MWNP (T 31N, R 14E, S1/2 S15, S1/2 Section 16, NE1/4 S16, NE1/4 S21 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.

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

## **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. Criteria for designating native and non-native taxa followed Fernald (1950), Steyermark (1963), Mohlenbrock (1986), and Gleason and Cronquist (1991).

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 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 ( $m^2/ha$ ), 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 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  $< 1.5$  m tall) of the small wet-mesic prairie remnant and an adjacent successional field with some prairie species were analyzed 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). The midpoint of each cover class will be used to determine the cover of each occurrence (class 1 = 0 to 1% with a midpoint of 0.5%, class 2 = >1 to 5% with a midpoint of 3.0%, class 3 = >5 to 25% with a midpoint of 15.0%, class 4 = >25 to 50% with a midpoint of 37.5%, class 5 = >50 to 75% with a midpoint of 62.5%, class 6 = >75 to 95% with a midpoint of 85.0%, class 7 = >95 to 100% with a midpoint of 97.5%). 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 by 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 (N) of an inventory site [FQI = mean C(N)].

## DESCRIPTION OF THE STUDY AREA

The study areas are 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 Flood 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 ac) of land in Illinois and adjacent northwestern Indiana (Suloway and Hubbell 1994, Indiana Division of Water personal communication). The 1,010 ha (2,500 ac) 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 ac) 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 (BSC) 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).

Here, the presettlement vegetation in and along much of the Kankakee River (figure 1) was mostly wet to wet-mesic forests, though wet prairie was also present. Characteristic sand savanna and sand prairie vegetation prevailed on higher sandy areas (King 1981). 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 are not legible for the study areas (Public Land Survey 1834). However, enough can be read to give a fairly good idea of the vegetation of this area. 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 rivers edge. The islands were described as being mostly covered with water and "thickly set with swamp [probably silver] maple and birch"; *Quercus macrocarpa* Michaux (bur oak) and ash were occasionally mentioned, as was spice [probably *Lindera benzoin* (L.) Bush

(spicebush)] in the understory. The land at the rivers 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;” 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, white oak, *Quercus rubra* Lam. (red oak), and bur oak, with no undergrowth other than *Corylus americana* Walt. (hazel) occasionally mentioned.

In this survey, six natural plant communities were recognized within the MW study area. The cultural communities are represented by successional fields, levees, roadsides, and abandoned railroad right-of-ways. Three natural wetland communities are 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 are present: a slightly elevated dry-mesic upland forest bordering the northeast side of MWLWR and a small <1 ha wet-mesic prairie remnant along a railroad right-of-way within the reserve.

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) mean annual precipitation is 101.7 cm, with the month of April having the highest rainfall (11.4 cm). Mean annual temperature in Lowell is 9.2°C with the hottest month being July (average of 22.6°C) and the coldest January (average of -6.4°C) (Midwestern Climate Center 1999). The number of frost free days is 160 to 170.

## 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). Genera represented by the most taxa were *Carex* (17), *Polygonum* (10), *Aster* (7), *Panicum* (7), and *Solidago* (6). Families with the most taxa were Asteraceae (59), Poaceae (44), Cyperaceae (26), Lamiaceae (18), Rosaceae (18), Polygonaceae (14), Brassicaceae (12), Caryophyllaceae (11), Apiaceae (10), and Fabaceae (10). 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 2 & 3. Most of these communities have been influenced by various disturbances such as flooding, fire, fire suppression, grazing, wildlife activity, such as browsing by *Odocoileus virginianus* (white-tailed deer), and past management practices (Ebinger and McClain 1991).

Natural communities recognized at MW:

1. **Shrub swamps/marshes:** This community complex was widely scattered throughout the MW and accounted for 26.0% or 7.6 ha (18.7 ac) of the 29.2 ha (72 ac) MWNP and 15.0% or 31.5 ha (77.7 ac) of the 210.2 ha (519 ac) MWLWR (Figures 2 & 3). It is a narrow community formed within a 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 channels varied greatly in composition; determined at least somewhat by frequency and duration of inundation, with some seasonal changes they included mud flats, herb dominated, shrub dominated, and forested areas. However, the most frequent situation was herb or shrub dominated. Trees were present occasionally and included: silver maple, red/green ash, pin oak, *Betula nigra* L. (river birch), swamp cottonwood, and pumpkin ash. Swamp cottonwood and pumpkin ash were rare at the MW, their most northern vouchered range in Illinois. The dominant shrub was *Cephalanthus occidentalis* L. (buttonbush). Dominant herbs included: *Hibiscus laevis* All. (halberd-leaved rose mallow), *Leersia oryzoides* (L.) Swartz (L.) Swartz (rice cutgrass), *Leersia virginica* Willd. (white grass), *Penthorum sedoides* L. (ditch stonecrop), *Pilea pumila* L. (clearweed), *Polygonum hydropiperoides* Michaux (mild water peper), *Rumex verticillatus* L. (swamp dock), *Sagittaria latifolia* Willd. (common arrowleaf) and *Saururus cernuus* L. (lizard's-tail). One frequent herb was climbing hempweed; 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: *Azola caroliniana* Willd. (eastern mosquito fern), pumpkin ash, climbing hempweed, and swamp cottonwood. Most of the species had a C from two to five. Seven adventive species were included in calculating the FQI. If these species were excluded from the calculations, the FQI of the site was 27.36 and the mean C was 3.42. For a floodplain community this is a good mean C (above 3.00) and indicates the community has good floristic quality.

2. **Wet floodplain forest:** This community accounted for 40.4% or 11.8 ha (29 ac) of the MWNP and 53.7% or 112.8 ha (278.5 ac) of the MWLWR (Figure 2 and 3). The wet floodplain forest was characterized by frequent flooding during the growing season and a low diversity of woody and herbaceous species (117 species). Silver maple was the dominant tree species. Few woody understory trees and shrubs occurred in the very open understory. Common woody vines included: *Campsis radicans* (L.) Seem (trumpet creeper) and *Toxicodendron radicans* (L.) Kuntze (poison ivy). Herbaceous species included: *Acalypha rhomboidea* Raf. (three-seeded Mercury), *Aster lanceolatus* Willd. (panicked aster), *Bidens frondosa* L. (common beggar-ticks), *Laportea canadensis* (L.) Wedd. (wood nettle), *Leersia lenticularis* Michaux (catchfly grass), *Lobelia cardinalis* L. (Cardinal flower), clearweed, *Polygonum punctatum* Ell. (smartweed), and lizard's tail. The floristic integrity 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. Most of the species had a C from two to five. 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.
3. **Wet-mesic floodplain forest:** This community accounted for 33.6% or 9.8 ha (24.3 ac) of the MWNP and 7.7% or 16.1 ha (39.7 ac) of the MWLWR (Figures 2 & 3). The wet-mesic floodplain forest was characterized by flooding during the growing season that is much less frequent and for 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 the wet floodplain forest with swamp white oak, pin oak, and silver maple the dominant tree species. Woody understory trees and shrubs were

relatively dense with numerous saplings, especially spicebush and red/green ash. American storax, a state threatened shrub, was occasional here, 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, *Menispermum canadense* L. (moonseed vine), *Smilax hispida* Muhl. (hispid greenbrier), and poison ivy. Herbaceous species included: *Arisaema dracontium* (L.) Schott (green dragon), *Cardamine bulbosa* (Schrab.) BSP. (creeping cress), *Lysimachia hybrida* Michaux (loosestrife), *Onoclea sensibilis* L. (sensitive fern), *Osmunda regalis* L. (regal fern), and *Polygonum virginianum* L. (Virginia knotweed). The floristic integrity 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: *Ilex verticillata* (L.) Gray (winterberry), *Lycopus rubellus* Moench. (stalked water horehound), climbing hempweed, *Monotropa uniflora* L. (Indian pipe), regal fern, American storax, and *Viburnum acerifolium* L. (maple-leaved viburnum). Most of the species had a C from two to five. 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).

4. **Dry-mesic upland forest:** This community accounted for 14.8% or 31.2 ha (77.1 ac) of the MWLWR (Figure 3). The dry-mesic upland forest was characterized by large widely dispersed black oaks and a relatively dense understory dominated by *Prunus serotina* Ehrh. (black cherry). The tree diversity and total stems/ha was less than the other forested communities within

the MW study area while the understory saplings had the highest total stems/ha (Table 2 & Table 3). Common woody vines included: *Parthenocissus quinquefolia* (L.) Planch. (Virginia creeper), poison ivy, and *Vitis riparia* Michaux (riverbank grape). Herbaceous species included: *Anemonella thalictroides* (L.) Spach. (rue anemone), *Carex cephalophora* Muhl. ex Willd. (short-headed bracted sedge), *Carex pensylvanica* Lam. (Pennsylvania oak sedge), *Festuca obtusa* Biehler (nodding sedge), *Krigia biflora* (Walt.) Blake (false dandelion), *Polygonatum biflorum* (Walt.) Ell. (Solomon's seal), and *Solidago caesia* L. (woodland goldenrod). The floristic integrity 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: *Carex swanii* (Fernald) Mackenzie (downy green sedge) and maple-leaved viburnum. Most of the species had a C from two to five. Thirteen adventive species were included in calculating the FQI. If these species were excluded from the calculations the FQI of the site was 32.90 and the mean C was 3.43.

5. **Wet-mesic prairie:** This community accounted for 0.2% or 0.4 ha (1.1 ac) of the MWLWR (Figure 3). This small wet-mesic prairie remnant is located along the northern edge of the MWLWR next to a railroad right-of-way. This community was characterized by the prominent prairie grasses and forbs. Species diversity was relatively high, 31 species recorded in the plots (Table 4). The prominent prairie grasses included: big bluestem, *Sorghastrum nutans* (L.) Nash (Indian grass), and *Spartina pectinata* Link (cord grass). The prominent forbs included downy sunflower, tall goldenrod, *Solidago rigida* L. (rigid goldenrod), and *Aster ericoides* L. (heath aster). The prominent shrub was Northern dewberry. Presently, the prairie is the subject of restoration activities. The floristic integrity was 37.06 for the site, while the mean C was

3.60 (Table 1). Only four species were encountered with a C greater than seven: *Carex bicknellii* Britton (Bicknell's sedge), *Carex buxbaumii* Wahlenb. (dark-scaled sedge), *Dalea candida* (Michaux) Willd. (white prairie clover), and *Prenanthes aspera* Michaux (rough white lettuce). Most of the species had a C from two to five. Six adventive species were included in calculating the FQI. If these species were excluded from the calculations the FQI of the site was 38.20 and the mean C was 3.82. This community had the highest FQI and mean C at the MW. In general, an FQI greater than 35 tends to be at sites that are regionally noteworthy (Taft, et al. 1997).

6. **Cultural:** This community accounted for 8.6% or 18.2 ha (44.9 ac) of the MWLWR (Figure 3). The cultural communities are created and maintained by human disturbance and were represented at the MWLWR by successional fields and developed lands (abandoned railroad right-of-way and road). A field adjacent to the wet-mesic prairie community was surveyed. Twenty-four species were recorded in plots (Table 5). Prominent prairie grasses included: big bluestem, Indian grass, and *Panicum virgatum* L. (switch grass), while common forbs included: tall goldenrod, *Euthamia graminifolia* (L.) Nutt. (grass-leaved goldenrod), *Potentilla simplex* Michaux (common cinquefoil), and *Hypericum sphaerocarpum* Michaux (round-leaved St. John's-wort). Presently, the successional field surveyed here is the subject of restoration activities. The floristic integrity of the entire cultural community was 25.60, while the mean C was 1.93 (Table 1). No species were encountered with a C greater than seven. Most of the species had a C from two to five. Forty adventive species were included in calculating the FQI. If these species were excluded from the calculations the FQI of the site was 29.15 and the mean C was 2.50.



Quantitative vegetation analysis of the forest at MW and an analysis of the floristic integrity of the MWNP:

The overstory of the wet floodplain forest at the MWLWR contained seven tree species (three species were common) with a density of 369 stems/ha and basal area of 34.09 m<sup>2</sup>/ha (Figure 3; 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, mostly restricted to the small diameter classes, had an average diameter of 19.6 cm, and ranked second with an IV of 43.7. Green/red ash, mostly occurring in the small diameter classes, had an average diameter of 26.9 cm, and ranked third with an IV of 39.6. Dead-standing individuals, most commonly American elm and silver maple, averaged 45 stems/ha with a basal area of 2.67 m<sup>2</sup>/ha. The understory was very open with few saplings (170 stems/ha) present (Table 3). Numerous tree and shrub seedlings were encountered, an average of 97,100 stems/ha (Table 3). Nearly all tree and shrub seedlings were <10 cm tall and most may soon die due to dense shade and flooding.

Within the wet-mesic floodplain forest at the MWNP, the overstory contained eight tree species (five species were common) with a density of 388.7 stems/ha and basal area of 30.64 m<sup>2</sup>/ha (Figure 2; Table 6). 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. An obvious feature of this community was the large number of dead-standing trees which averaged 56.5 stems/ha and had a basal area of 4.46 m<sup>2</sup>/ha (Table 7). Tree seedlings were extremely common, averaged >1,000,000 stems/ha (Table 8) 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 (Table 8).

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 m<sup>2</sup>/ha (Figure 3; 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 m<sup>2</sup>/ha. Tree seedlings were numerous but less abundant than at the MWNP, 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 (Table 3).

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 m<sup>2</sup>/ha (Figure 3; 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 ranked third with an IV of 34.1 and dominated the 10 - 19 cm diameter class. Black cherry probably became common after grazing ceased and after earlier logging of the oaks released the cherry from shading. Dead-standing individuals averaged 7 stems/ha with a basal area of 1.14 m<sup>2</sup>/ha. Black oaks were the only dead-standing individuals encountered. Tree

seedlings were common but less abundant than in the floodplain forest, an average of 28,200 stems/ha (Table 3). Nearly all tree seedlings were <10 cm tall. Seedlings of black oak, red/green ash, and black cherry were the most abundant. 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).

The floristic integrity of the MWNP was 32.68 for the site, while the mean C was 3.13 (Table 1). Only five species were encountered with a C greater than seven: Eastern mosquito fern, winterberry, stalked water horehound, climbing hempweed, and American storax. Most of the species had a C from two to five. Eleven adventive species were included in calculating the FQI. If these species were excluded from the calculations the FQI of the site was 34.45 and the mean C was 3.48. In general, an FQI greater than 35 denotes sites that are regionally noteworthy (Taft, et al. 1997). We consider MWNP, shrub swamp/marsh community, wet floodplain forest community, wet-mesic floodplain forest community, and wet-mesic prairie community as regionally noteworthy.

### LITERATURE CITED

- Bailey, A.W. and C.E. Poulton. 1968. Plant communities and environmental relationships in a portion of the Tillamook burn, northwestern Oregon. *Ecology* 49:1-13.
- Bridges, W. 1934. They say the Kankakee is coming back: Indiana has a practical plan for restoring a hundred thousand acres of the famous marshland to a wildlife paradise. *New York Zoological Society Bulletin*. 37:205-212.

- Daubenmire, R. 1959. A canopy coverage method of vegetation analysis. *Northwest Science* 33:43-64.
- Ebinger, J.E. and W.E. McClain. 1991. Forest succession in the prairie peninsula of Illinois. *Illinois Natural History Survey Bulletin* 34:375-381.
- Fehrenbacher, J.B., G.O. Walker, and H.L. Wascher. 1967. *Soils of Illinois*. University of Illinois Agriculture Experiment Station Bulletin 725:1-47.
- Fernald, M.L. 1950. *Gray's manual of botany*, 8th ed. American Book Company, New York. lxiv+1,632 pages.
- Gleason, H.A. and A. Cronquist. 1991. *Manual of the vascular flora of northeastern United States and adjacent Canada*. 2nd ed. The New York Botanical Garden, Bronx, New York. lxxv+910 pages.
- Horn, S. 1998. *Momence Wetlands Land & Water Reserve Registry Proposal*. Unpublished Proposal for the Division of Natural Heritage, Illinois Department of Natural Resources & Illinois Nature Preserves Commission. Normal, Illinois. 33 pages.
- King, J.E. 1981. Late Quaternary vegetational history of Illinois. *Ecological Monographs* 51:43-62.
- McIntosh, R.P. 1957. The York Woods. A case history of forest succession in southern Wisconsin. *Ecology* 38:29-37.
- Midwestern Climate Center 1999. <http://mcc.sws.uiuc.edu>
- Mohlenbrock, R.H. 1986. *Guide to the vascular flora of Illinois*, revised and enlarged edition. Southern Illinois University Press, Carbondale. viii+507 pages.
- Page J.L. 1949. *Climate of Illinois*. University of Illinois Agriculture Experiment Station Bulletin 39:93-364.
- Paschke, J.E. 1979. *Soil survey of Kankakee County, Illinois*. U.S. Department of Agriculture, Soil Conservation Service, In Cooperation with the University of Illinois Agricultural Experiment Station, Urbana. 84 pages + maps.

- Public Land Survey 1834. Illinois State Library Archives. Volume 359.
- Schwegman, J.E., M. Hutchison, G. Paulson, G.B. Fell, W.M. Shepherd, and J. White. 1973. Comprehensive plan for the Illinois nature preserves system. Part 2. The natural divisions of Illinois. Illinois Nature Preserves Commission, Rockford. 32 pages + map.
- Steyermark, J.A. 1963. Flora of Missouri. Iowa State University Press, Ames. lxxxiii+1728 pages.
- Suloway, L., and M. Hubbell. 1994. Wetland resources of Illinois: an analysis and atlas. Illinois Natural History Survey Special Publication 15. 88 pages.
- Taft, J.B., G.S. Wilhelm, D.M. Ladd and L.A. Masters. 1997. Floristic quality assessment for vegetation in Illinois, a method for assessing vegetation integrity. *Erigenia* 15: 1-95.
- White, J. and M.H. Madany. 1978. Classification of natural communities in Illinois. pages 310-505. in J. White (editor), Illinois natural areas inventory. Technical report. Illinois Natural Areas Inventory, Urbana.
- William, H.B. and J.C. Frye. 1970. Pleistocene stratigraphy of Illinois. Illinois State Geological Survey Bulletin 94:1-204.

### ACKNOWLEDGMENT

The authors would like to thank Fran Harty, Department of Natural Resources, Division of Natural Heritage, Champaign, for help in the survey of the MWNP and his encouragement of the project. The authors would also like to thank David M. Ketzner, Illinois Natural History Survey, Center for Wildlife Ecology, Champaign, for help in determining acreage of the communities at MWNP and MWLWR. The authors would finally like to thank Mary Ann E. Feist and Richard L. Larimore, from the Illinois

Natural History Survey, Center for Wildlife Ecology, for their reading and critical review of this report.

# MOMENCE WETLANDS, KANKAKEE COUNTY, ILLINOIS

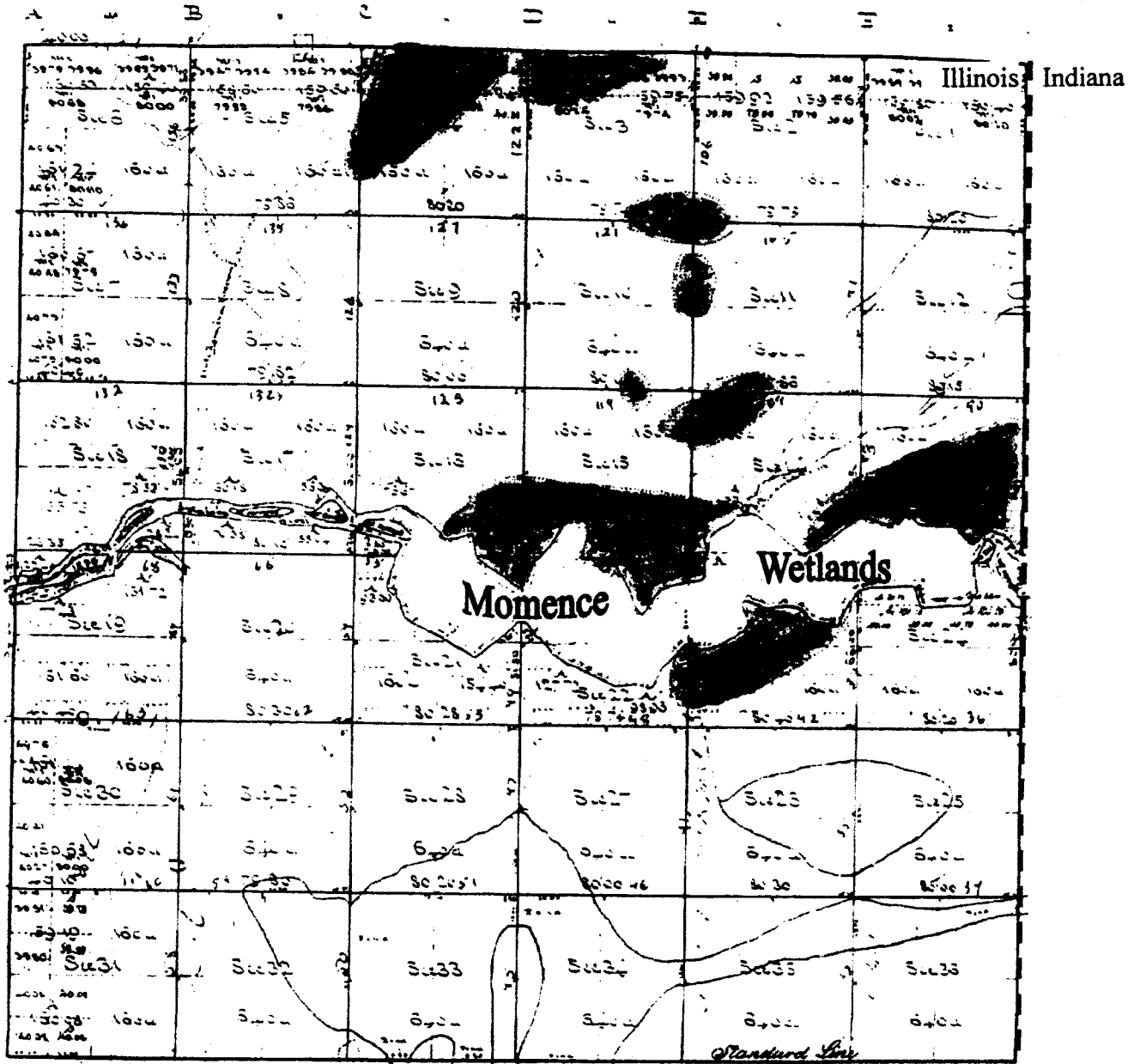


Figure 1. Spring 1834 pre-European settlement map of the Momence Wetlands along the Kankakee River, Kankakee County, Illinois. Gray shaded areas represent wooded sites, most likely oak savannas.

# MOMENCE WETLANDS NATURE PRESERVE

(72 acres)

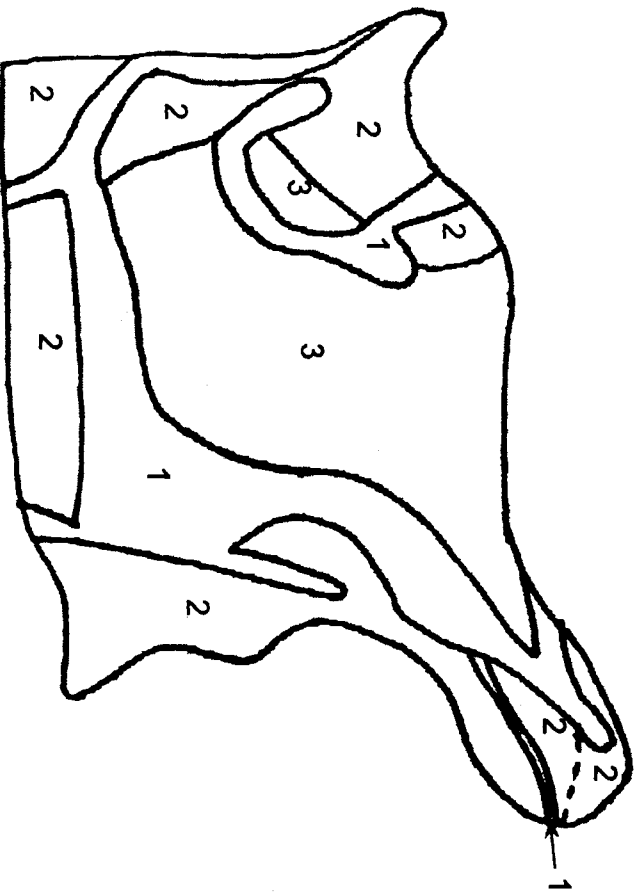


Figure 2. Natural communities of the Momenca Wetlands Nature Preserve, Kankakee County, Illinois: (1) shrub swamp/marsh, (2) wet floodplain forest, and (3) wet-mesic floodplain forest.



MOMENCE WETLANDS LAND AND WATER RESERVE (519 acres)

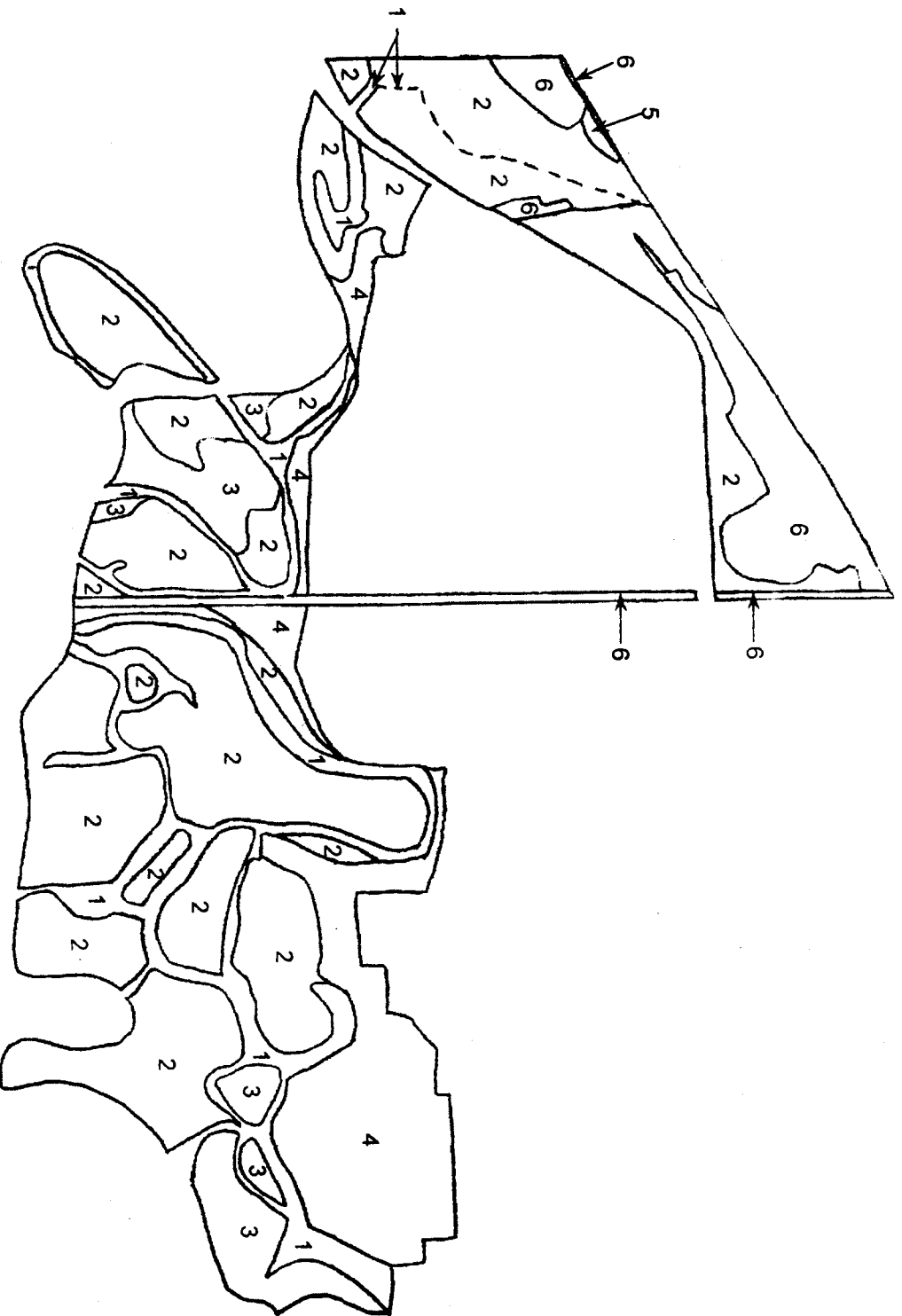


Figure 3. Natural communities of the Momenche Wetlands Land and Water Reserve, Kankakee County, Illinois: (1) shrub swamp/marsh, (2) wet floodplain forest, (3) wet-mesic floodplain forest, (4) dry-mesic upland forest, (5) wet-mesic prairie, and (6) cultural.

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; 6 = cultural) at Momence Wetlands and the Momence Wetlands Nature Preserve (MWNP), Kankakee County, Illinois.

| Parameter                     | 1     | 2      | 3      | 4      | 5      | 6      | NWNP   |
|-------------------------------|-------|--------|--------|--------|--------|--------|--------|
| Total hectares                | 39.10 | 124.60 | 25.90  | 31.20  | 0.40   | 18.20  | 29.20  |
| Total Species Richness        | 71.00 | 117.00 | 115.00 | 105.00 | 106.00 | 176.00 | 109.00 |
| Native Species Richness       | 64.00 | 107.00 | 104.00 | 92.00  | 100.00 | 136.00 | 98.00  |
| % Adventive                   | 09.86 | 08.55  | 09.57  | 12.38  | 05.66  | 22.73  | 10.09  |
| Floristic Quality Index (FQI) | 25.95 | 30.83  | 36.25  | 30.84  | 37.06  | 25.60  | 32.68  |
| FQI (native)                  | 27.36 | 32.17  | 38.14  | 32.90  | 38.20  | 29.15  | 34.45  |
| Mean Conservatism             | 03.08 | 02.85  | 03.38  | 03.01  | 03.60  | 01.93  | 03.13  |
| Mean Conservatism (native)    | 03.42 | 03.11  | 03.74  | 03.43  | 03.82  | 02.50  | 03.48  |
| # Rare Species (T & E)        | 00.00 | 00.00  | 01.00  | 00.00  | 00.00  | 00.00  | 01.00  |

Table 2. Densities (stems/ha), diameter classes, basal areas (m<sup>2</sup>/ha), relative values, importance values, and average diameters of the woody species in three forest communities at the Mokence Wetlands Land and Water Reserve, Kankakee County, Illinois.

| Species                            | Diameter Classes (cm) |         |         |         |         |         |     | Total<br>stems/ha | Basal<br>Area<br>m <sup>2</sup> /ha | Rel.<br>Den. | Rel.<br>Dom. | I.V.  | Av.<br>Diam.<br>(cm) |
|------------------------------------|-----------------------|---------|---------|---------|---------|---------|-----|-------------------|-------------------------------------|--------------|--------------|-------|----------------------|
|                                    | 10 - 19               | 20 - 29 | 30 - 39 | 40 - 49 | 50 - 59 | 60 - 70 | 70+ |                   |                                     |              |              |       |                      |
| <b>Wet Floodplain Forest</b>       |                       |         |         |         |         |         |     |                   |                                     |              |              |       |                      |
| Silver Maple                       | 11                    | 45      | 48      | 23      | 9       | 14      | 12  | 162               | 24.04                               | 43.9         | 70.5         | 114.4 | 39.5                 |
| American Elm                       | 69                    | 38      | 9       | 2       | -       | -       | -   | 118               | 4.02                                | 31.9         | 11.8         | 43.7  | 19.6                 |
| Red/Green Ash                      | 25                    | 28      | 20      | 12      | 1       | -       | -   | 86                | 5.57                                | 23.3         | 16.3         | 39.6  | 26.9                 |
| Swamp White Oak                    | -                     | -       | -       | -       | 1       | -       | -   | 1                 | 0.26                                | 0.3          | 0.8          | 1.1   | 57.5                 |
| Cottonwood                         | -                     | -       | -       | 1       | -       | -       | -   | 1                 | 0.16                                | 0.3          | 0.5          | 0.8   | 44.5                 |
| River Birch                        | -                     | 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 |                      |
| <b>Wet-mesic Floodplain Forest</b> |                       |         |         |         |         |         |     |                   |                                     |              |              |       |                      |
| Swamp White Oak                    | 13                    | 13      | 11      | 14      | 8       | 5       | 4   | 68                | 9.62                                | 20.1         | 36.2         | 56.3  | 38.2                 |
| Pin Oak                            | 23                    | 21      | 16      | 11      | 4       | 2       | 1   | 78                | 6.83                                | 23.0         | 25.7         | 48.7  | 30.1                 |
| American Elm                       | 32                    | 26      | 7       | 2       | 2       | -       | -   | 69                | 3.06                                | 20.4         | 11.5         | 31.9  | 21.9                 |
| Red/Green Ash                      | 41                    | 14      | 10      | 3       | -       | -       | -   | 68                | 2.59                                | 20.1         | 9.8          | 29.9  | 19.9                 |
| Silver Maple                       | 19                    | 3       | 2       | 2       | 2       | -       | -   | 28                | 1.39                                | 8.3          | 5.2          | 13.5  | 21.4                 |
| River Birch                        | 1                     | -       | 3       | 2       | 4       | -       | -   | 10                | 1.53                                | 2.9          | 5.8          | 8.7   | 42.4                 |
| Bur Oak                            | -                     | 1       | 2       | 1       | 1       | 1       | 1   | 7                 | 1.28                                | 2.0          | 4.8          | 6.8   | 46.0                 |
| Black Cherry                       | 6                     | 1       | -       | -       | -       | -       | -   | 7                 | 0.11                                | 2.0          | 0.4          | 2.4   | 13.6                 |
| Red Oak                            | 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 |                      |
| <b>Dry-mesic Upland Forest</b>     |                       |         |         |         |         |         |     |                   |                                     |              |              |       |                      |
| Black Oak                          | -                     | 1       | 18      | 40      | 24      | 5       | 2   | 90                | 16.33                               | 35.7         | 73.3         | 109.0 | 47.2                 |
| White Oak                          | 21                    | 39      | 17      | 5       | -       | -       | -   | 82                | 4.77                                | 32.5         | 21.4         | 53.9  | 25.9                 |
| Black Cherry                       | 72                    | 1       | 2       | -       | -       | -       | -   | 75                | 0.96                                | 29.8         | 4.3          | 34.1  | 12.2                 |
| Red Oak                            | -                     | -       | 2       | -       | -       | -       | -   | 2                 | 0.20                                | 0.8          | 0.9          | 1.7   | 35.2                 |
| American Elm                       | 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 Momence Wetlands Land and Water Reserve, Kankakee County, Illinois.

| Species                            | Seedlings | Small Saplings | Large Saplings |
|------------------------------------|-----------|----------------|----------------|
| <b>Wet Floodplain Forest</b>       |           |                |                |
| Red/Green Ash                      | 67,000    | --             | 25             |
| American Elm                       | 15,600    | --             | 30             |
| Silver Maple                       | 14,400    | --             | 15             |
| Pin Oak                            | 100       | --             | --             |
| White Mulberry                     | --        | 50             | --             |
| Buttonbush                         | --        | 50             | --             |
| Totals                             | 97,100    | 100            | 70             |
| <b>Wet-mesic Floodplain Forest</b> |           |                |                |
| Red/Green Ash                      | 21,700    | 800            | 205            |
| American Elm                       | 9,500     | 50             | 70             |
| Silver Maple                       | 700       | --             | 60             |
| Sassafras                          | 100       | --             | 5              |
| Black Cherry                       | --        | --             | 30             |
| Pin Oak                            | --        | --             | 30             |
| River Birch                        | --        | --             | 5              |
| Swamp White Oak                    | --        | --             | 5              |
| Spicebush                          | 41,700    | 1,400          | --             |
| Dogwood                            | 1,600     | --             | --             |
| Other shrubs                       | 900       | 700            | --             |
| Totals                             | 76,200    | 2,950          | 410            |
| <b>Dry-mesic Upland Forest</b>     |           |                |                |
| Black Oak                          | 13,100    | 500            | 5              |
| Red/Green Ash                      | 8,600     | 400            | 15             |
| Black Cherry                       | 2,800     | 1,500          | 2,070          |
| White Oak                          | 900       | --             | --             |
| American Elm                       | 700       | 100            | 55             |
| Silver Maple                       | 400       | --             | --             |
| Sassafras                          | 100       | 450            | 15             |
| Shagbark Hickory                   | 100       | --             | 5              |
| Other trees                        | --        | 150            | 15             |
| Missouri Gooseberry                | 800       | --             | --             |
| Black Haw                          | 500       | --             | --             |
| Japanese Barberry                  | 200       | --             | --             |
| Totals                             | 28,200    | 3,100          | 2,180          |

Table 4. 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<br>% | Average<br>Cover | Relative<br>Frequency | Relative<br>Cover | Importance<br>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 sphaerocarpum</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               |

Table 5. Frequency (%), average cover, relative frequency, relative cover, and importance value of the ground layer species encountered in a successional field 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>Solidago canadensis</i>       | 46.0        | 38.60         | 15.9               | 33.7           | 49.6             |
| <i>Rubus flagellaris</i>         | 36.0        | 17.56         | 12.4               | 15.4           | 27.8             |
| <i>Andropogon gerardii</i>       | 14.0        | 14.00         | 4.8                | 12.2           | 17.0             |
| <i>Poa pratensis</i>             | 42.0        | 2.04          | 14.5               | 1.8            | 16.3             |
| <i>Euthamia graminifolia</i>     | 14.0        | 4.36          | 4.8                | 3.8            | 8.6              |
| <i>Potentilla simplex</i>        | 18.0        | 2.72          | 6.2                | 2.4            | 8.6              |
| <i>Sorghastrum nutans</i>        | 10.0        | 6.00          | 3.4                | 5.2            | 8.6              |
| <i>Hypericum sphaerocarpum</i>   | 16.0        | 2.48          | 5.5                | 2.2            | 7.7              |
| <i>Carex</i> spp.                | 14.0        | 2.04          | 4.8                | 1.8            | 6.6              |
| <i>Panicum virgatum</i>          | 8.0         | 3.84          | 2.8                | 3.4            | 6.2              |
| <i>Anemone canadensis</i>        | 10.0        | 3.12          | 3.4                | 2.7            | 6.1              |
| <i>Stachys tenuifolia</i>        | 12.0        | 1.80          | 4.1                | 1.6            | 5.7              |
| <i>Galium obtusum</i>            | 14.0        | 0.28          | 4.8                | 0.3            | 5.1              |
| <i>Helianthus grosseserratus</i> | 6.0         | 2.64          | 2.1                | 2.3            | 4.4              |
| <i>Rosa carolina</i>             | 6.0         | 1.68          | 2.1                | 1.5            | 3.6              |
| <i>Rudbeckia subtomentosa</i>    | 4.0         | 2.40          | 1.4                | 2.1            | 3.5              |
| <i>Geum laciniatum</i>           | 4.0         | 2.40          | 1.4                | 2.1            | 3.5              |
| <i>Panicum lanuginosum</i>       | 4.0         | 1.24          | 1.4                | 1.1            | 2.5              |
| <i>Aster lanceolatus</i>         | 2.0         | 1.20          | 0.7                | 1.0            | 1.7              |
| <i>Muhlenbergia mesicana</i>     | 2.0         | 1.20          | 0.7                | 1.0            | 1.7              |
| <i>Eryngium yuccifolium</i>      | 2.0         | 1.20          | 0.7                | 1.0            | 1.7              |
| <i>Rosa setigera</i>             | 2.0         | 1.20          | 0.7                | 1.0            | 1.7              |
| <i>Ulmus americana</i>           | 2.0         | 0.24          | 0.7                | 0.2            | 0.9              |
| <i>Cornus</i> sp.                | 2.0         | 0.24          | 0.7                | 0.2            | 0.9              |
| Totals                           |             | 114.48        | 100.0              | 100.0          | 200.0            |

Table 6. Densities (stems/ha), diameter classes, basal areas (m<sup>2</sup>/ha), relative values, importance values and average diameters of woody species in the wet-mesic floodplain forest at Momenca Wetlands Nature Preserve, Kankakee County, Illinois.

| Species         | Diameter Classes (cm) |         |         |         |         |         | Total<br>stems/ha | Basal |                            |              | A.V.<br>Diam.<br>(cm) |              |      |
|-----------------|-----------------------|---------|---------|---------|---------|---------|-------------------|-------|----------------------------|--------------|-----------------------|--------------|------|
|                 | 10 - 19               | 20 - 29 | 30 - 39 | 40 - 49 | 50 - 59 | 60 - 70 |                   | 70+   | Area<br>m <sup>2</sup> /ha | Rel.<br>Den. |                       | Rel.<br>Dom. | I.V. |
| Silver Maple    | 67.5                  | 30.4    | 19.2    | 9.0     | 4.2     | 3.8     | 7.0               | 141.1 | 11.94                      | 36.2         | 39.0                  | 75.2         | 27.2 |
| Pin Oak         | 13.4                  | 22.4    | 17.6    | 12.8    | 9.3     | 3.5     | 3.2               | 82.2  | 9.95                       | 21.2         | 32.5                  | 53.7         | 35.7 |
| Red/Green Ash   | 23.4                  | 27.2    | 11.2    | 2.9     | -       | 0.3     | -                 | 65.0  | 3.28                       | 16.7         | 10.7                  | 27.4         | 23.9 |
| Swamp White Oak | 20.5                  | 8.0     | 6.1     | 3.2     | 1.3     | 1.3     | 0.9               | 41.3  | 2.98                       | 10.6         | 9.7                   | 20.3         | 26.2 |
| American Elm    | 30.4                  | 18.3    | 5.1     | 0.6     | -       | -       | -                 | 54.4  | 1.92                       | 14.0         | 6.3                   | 20.3         | 19.9 |
| River Birch     | 1.0                   | 0.6     | 1.6     | 0.3     | -       | 0.3     | -                 | 3.8   | 0.34                       | 1.0          | 1.1                   | 2.1          | 31.0 |
| Honey Locust    | -                     | -       | -       | 0.6     | -       | -       | -                 | 0.6   | 0.10                       | 0.2          | 0.3                   | 0.5          | 44.5 |
| Cottonwood      | -                     | -       | -       | -       | -       | -       | 0.3               | 0.3   | 0.13                       | 0.1          | 0.4                   | 0.5          | 73.0 |
| Totals          | 156.2                 | 106.9   | 60.8    | 29.4    | 14.8    | 9.2     | 11.4              | 388.7 | 30.64                      | 100.0        | 100.0                 | 200.0        |      |

Table 7. 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<br>(stems/ha) | Basal<br>Area<br>(m <sup>2</sup> ha) | Average<br>Diameter<br>(cm) |
|-----------------|-----------------------|--------------------------------------|-----------------------------|
| American Elm    | 23.0                  | 1.30                                 | 23.7                        |
| Pin Oak         | 12.2                  | 1.28                                 | 31.4                        |
| Silver Maple    | 10.6                  | 1.32                                 | 33.3                        |
| Red/Green Ash   | 4.5                   | 0.09                                 | 15.1                        |
| River Birch     | 4.2                   | 0.40                                 | 34.1                        |
| Swamp White Oak | 2.0                   | 0.07                                 | 18.1                        |
| Totals          | 56.5                  | 4.46                                 |                             |



Table 8. 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) in the wet-mesic floodplain forest at Momence Wetlands Nature Preserve, Kankakee County, Illinois.

| Species        | Seedlings | Small Saplings | Large Saplings |
|----------------|-----------|----------------|----------------|
| American Elm   | 720,000   | --             | 28             |
| Red/Green Ash  | 324,500   | 50             | 10             |
| Silver Maple   | 177,500   | 50             | 113            |
| Pin Oak        | 500       | --             | --             |
| White Mulberry | 500       | --             | --             |
| Buttonbush     | 8,000     | 25             | --             |
| Totals         | 1,231,000 | 125            | 151            |

## 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, P 31227  
*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, P 30403  
*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, P 30364  
*Carex pellita* Muhl.: 5; P 30339  
*Carex pennsylvanica* Lam.: 4; P 30159  
*Carex radiata* (Wahlenberg) 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, P 30396  
*Carex swanii* (Fernald) Mackenzie: 4; P 30407  
*Carex tribuloides* Wahlenb.: 4; 30017  
*Carex typhina* Michaux: 3, 4; P 30015, P 30078  
*Cyperus aristatus* Rottb.: 1; P 29882  
*Cyperus erythrorhizos* Muhl.: 1, 2; P 30053, P 31361  
*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.) Shult. 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, P 31249,  
P 31272  
*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, P 30088  
*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,  
P 30091

*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, P 30361  
*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

### ACEREACEAE

- 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, P 30064

### ANACARDIACEAE

- Toxicodendron radicans* (L.) Kuntze: 2, 3, 4, 6; P 30985, P 31224

### 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* Walt.: 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, P 31264

### ASCLEPIADACEAE

- Asclepias incarnata* L.: 1, 2, 3, 5; P 29932, P 30149, P 30998  
*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, P 30060, P 30101  
*Aster ontarionis* Wieg.: 1, 2, 4; P 30087, P 30102-B, P 31270

*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, P 30976  
*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, P 30162

BETULACEAE

*Betula nigra* L.: 1, 2, 3; P 30062, P 30398

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 pennsylvanica* 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, P 30070

CAPRIFOLIACEAE

\**Lonicera x bella* Zabel: 4; P 30365

\**Lonicera maackii* (Rupr.) Maxim.: 4, 6; P 30093, P 30394

*Sambucus canadensis* L.: 4, 6; P 31240

*Viburnum acerifolium* L.: 3, 4; P 29938, P 30406

\**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, P 30380
- \**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, P 31263

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, P 30066  
*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, P 31254  
*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, P 30097  
*Lycopus virginicus* L.: 3; P 31267  
*Mentha arvensis* L. var. *villosa* (Benth.) S.R. Stewart: 1, 6; P 31000, P 31271  
*Mimulus ringens* L.: 2; P 29903  
\**Nepetea cataria* L.: 6; P 30139  
*Physostegia speciosa* (Sweet) Sweet: 2, 3, 5; P 29945, P 30112  
*Physostegia virginiana* (L.) Benth.: 1, 2, 3, 5; P 29896, P 31273  
*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, P 31005-A  
*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, P 29948, P 30049, P 30059, P 30061  
*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, P 30148  
*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 pennsylvanicum* L.: 3; P 29922, P 30141  
\**Polygonum persicaria* L.: 2, 3; P 29925, P 31261  
*Polygonum punctatum* Ell.: 1, 2, 3, 5, 6; P 29902, P 31247, P 31260  
*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, P 30138  
*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; 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  
*Spirea alba* Du Roi: 5; P 29988

RUBIACEAE

*Cephalanthus occidentalis* L.: 1, 2, 3; P 30058, P 30072  
*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, P 30160

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, P 30991  
\**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, P 30974  
*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, P 30140

#### ULMACEAE

- Celtis occidentalis* L.: 3; P 30081  
*Ulmus americana* L.: 2, 3, 4, 6; P 30057, P 30151, P 30166  
*Ulmus rubra* Muhl.: 3, 4; P 30074

#### URTICACEAE

- Boehmeria cylindrica* (L.) Sw.: 2, 3, 5, 6; P 29897, P 31262  
*Laportea canadensis* (L.) Wedd.: 2, 3; P 30079  
*Parietaria pensylvanica* Muhl.: 3; site record only  
*Pilea pumila* (L.) Gray: 1, 2, 3; P 29899, P 30109  
*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, P 31242

#### VIOLACEAE

- Viola pranticola* Greene: 3, 6; P 30076, P 30146  
*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, P 30400