ILLINOIS NATURAL HISTORY SURVEY

TECHNICAL REPORT

Vascular Flora of Spring Bay Fen Nature Preserve, Woodford County, Illinois

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INTRODUCTION

Location and Description

Spring Bay Fen Nature Preserve is a 12.7 ha (31.3 acre) natural area, located along the Illinois River in Woodford County, Illinois (Appendix 1), and occurs in an isolated sand deposit inclusion of the Illinois River Section of the Illinois River and Mississippi River Sand Areas Natural Division, within the Illinois River Section, of the Upper Mississippi River and Illinois River Bottomlands Natural Division (Schwegman 1973, Lineback 1979, McFall and Karnes 1995). In the mid 1970s, a portion of this preserve was designated as a grade A tall shrub fen during the original Illinois Natural Areas Inventory (INAI) (White 1978). In November 1979, the fen and additional acreages of adjacent community types were dedicated as a state nature preserve, with 10.6 ha (26.3 acres) representing natural community types, and an additional 1.9 ha (4.7 acres) representing a buffer zone on the eastern edge of the preserve (Appendix 2) (McFall and Karnes 1995).

Soils

The dominant soils of Spring Bay Fen Nature Preserve are slacwater silt loam and lena muck, respectively, which formed in sandy to clayey alluvial bottomland sediments (Fehrenbacher et al. 1984, Teater 1999). The tall shrub fen occurs in the lena muck, while nearly all of the adjacent floodplain habitats occur in slacwater silt loam (Teater 1999). Virtually the entire eastern edge of the preserve consists of loamy orthents (IDC 1979, Teater 1999); fill soils that were deposited in a portion of the fen habitat sometime in the early to mid 1970s, in order to expand the existing trailer park (IDC 1979). The exact year this occurred is uncertain, but the 1969 aerial photograph of this area shows no sign of this disturbance, and Arnold (1970) makes no mention of this, either. Previous to this disturbance, the soil type on the eastern border of the fen was coloma sand, on 7 to 15% slopes (Teater 1999). Soils extending nearly 400 m (1,320 ft.) south and east of the preserve, are also fill soils (Teater 1999), deposited in this area for housing developments - the construction of which began between 1957 and 1963, and increased dramatically between 1969 and 1988.

Vegetation/Vegetation Communities

Presently, vegetation communities in this preserve include tall shrub fen, floodplain forest, and open floodplain/shoreline areas, as well as highly variable transitional areas between these community types. Based on historic aerial photographs, recent and historic soil surveys, as well as current patterns of vegetation structure and composition, presettlement vegetation within this preserve and in surrounding areas was most likely an intergrading mosaic of open, savanna-like floodplain forest, and open wetland habitats (i.e. shrub fen, open fen, and sedge meadow/wet prairie) (see Appendix 3).

Located in the eastern portion of the preserve, is the last known remnant of Illinois River cold water tall shrub fen in the state (White 1978, McFall and Karnes 1995) (Appendices 2 and 4). It is uncertain how much of the area surrounding Spring Bay Fen Nature Preserve was historically represented by tall shrub fen habitat, but based upon examination of vegetation patterns in early aerial photographs (1939, 1951, and 1959) and early soil surveys (Smith et al. 1927), it is likely that this community type occupied a much more extensive area (Appendix 3 and 5). By 1939, most of the upland areas surrounding Spring Bay Fen had already been converted to agriculture (Appendix 6), and much of the bottomland area south of the preserve was destroyed in

subsequent years; first being converted to agriculture, and then to housing developments (see Appendices 6 - 12).

Several rare and uncommon vascular plant species historically are known, or have been reported from, Spring Bay Fen Nature Preserve, and include *Boltonia decurrens* (Torr. & Gray) Wood (decurrent false aster), *Cypripedium andrewsii* A. M. Fuller (Andrew's lady's-slipper orchid - hybrid of *C. candidum* X *C. parviflorum*), *Cypripedium parviflorum* Salisb. (small yellow lady's-slipper orchid), *Cypripedium reginae* Walt. (showy lady's-slipper orchid), *Filipendula rubra* (Hill) Robins. (queen of the prairie), *Liparis loeselii* (L.) Rich. (lesser twayblade orchid), *Saxifraga pensylvanica* L. (swamp saxifrage), and *Toxicodendron vernix* (L.) Kuntze (poison sumac) (Arnold 1970, Schwegman et al. 1977, White and Madany 1978, IDC 1979, ILLS 2009). No voucher specimens are known to exist for *Cypripedium parviflorum* from this area (Mohlenbrock 1970, Sheviak 1974), but Mohlenbrock (1970) reports a specimen for *C. andrewsii* from this area, collected by Virginius H. Chase, but gives no other collection information or the herbarium where the specimen is located. *Cypripedium parviflorum* is a species only known to occur in extreme northern Illinois (Sheviak 1974, Sheviak 1981), and it is unlikely that this taxon ever occurred at this site. To date, no comprehensive vouchered inventory of vascular plants occurring in this extremely rare wetland has been conducted, and the present study is the first comprehensive survey and inventory of this nature preserve.

MATERIALS AND METHODS

During the growing seasons of 2007 and 2008, multiple visits were made to Spring Bay Fen Nature Preserve to inventory and sample the vegetation. Voucher specimens were collected for all vascular plant taxa occurring within the preserve, and habitat data and GPS coordinates were recorded for all collections. Collections were identified and deposited in the herbarium of the Illinois Natural History Survey (ILLS), Champaign, Illinois. Nomenclature follows Mohlenbrock (2002).

Line transects, 100 m in length, were placed within dominant community types in the preserve (i.e. floodplain forest and tall shrub fen). Transect orientation was recorded, and GPS coordinates were taken at the transect starting and end points, for future reference. Ground flora compositions for both community types were evaluated by placing 1.0 m^2 quadrats at every other meter (i.e., 0, 2, 4, etc.) along the line transects. Quadrats were placed in an alternating pattern along transects, with every other quadrat being placed to the right or left. Cover values of all species (herbaceous species, seedlings [woody species < 50 cm tall], and vines) rooted within quadrats, as well as percent organic litter/bare ground, were estimated using Daubenmire (1959) cover classes as modified by Bailey and Poulton (1968), and are as follows: class 1 = 0 – 1%, class 2 = >1 – 5%, class 3 = >5 – 25%, class 4 = >25 – 50%, class 5 = >50 – 75%, class 6 = >75 – 95%, and class 7 = >95 – 100%. Midpoint values from cover classes were used in data analysis for each occurrence, and from these data, frequency, relative frequency, mean cover, relative cover, and importance value (IV 200 = sum of relative frequency and relative cover) were calculated for each species.

In the tall shrub fen community, the density of shrubs and small saplings (stems $\leq$ 50 cm tall and $\leq$ 2.5 cm DBH) was determined by counting all stems within 2 m on either side of the line transect, thus forming a belt transect 4 m wide and 100 m long (400 m^2). Density of large

saplings was determined by counting all stems (stems $\geq$ 1.0 m tall; and >2.5 to <10.0 cm DBH) within 10 m on either side of the line transect, thus forming a belt transect 20 m wide and 100 m long (2000 m²). Basal area (derived from DBH measurements) and density for trees (stems $\geq$ 10 cm DBH) was determined for all stems within the same 2000 m² belt transect used for large saplings. Importance values (IV 200) were calculated for each species by summing the relative density and relative basal area. Floodplain forest sampling for shrubs and small saplings, large saplings, and trees, was identical to sampling within the tall shrub fen community, with the exception that the belt transect sampling area for all three of these categories, was 2000 m².

To further evaluate floristic integrity of this site, the mean coefficient of conservatism ($\overline{C}$) and floristic quality index (FQI = [I]) were calculated for all community types occurring within the preserve, according to Taft et al. (1997), using the following formulae, respectively: $\overline{C} = \sum C/N$, where C is the coefficient of conservatism and N is the number of taxa; and $I = \overline{C}\ (\sqrt{N})$, where I is a weighted index of species richness, and is the product of $\overline{C}$ multiplied by the square root of the number of species ($\sqrt{N}$). Coefficients of conservatism (C) assigned to all vascular plant taxa occurring within the state, according to Taft et al. (1997), consist of a value ranging from 0 to 10, and represent a measure of each taxon's tolerance to habitat degradation. A C-value of 10 indicates the highest degree of fidelity to high quality natural areas, while a value of 0 indicates the lowest. Following this, taxa at the upper end of the conservatism spectrum (i.e., 7-10) are usually the first species to disappear as natural areas undergo various types of disturbance that lead to habitat degradation. Non-native taxa are automatically assigned a C-value of 0. For areas intensively surveyed, the FQI provides a rapid and effective means for making qualitative comparisons of floristic integrity among sites. Sites with a FQI (I) $\geq$ 35 or $\overline{C}$-value $\geq$ 3.5 are considered regionally noteworthy – possessing sufficient floristic quality to be considered at least marginally high quality natural areas (Swink and Wilhelm 1994, Taft et al. 1997).

Historic conditions of Spring Bay Fen Nature Preserve and adjacent areas were further assessed by obtaining aerial photographs from the University of Illinois Map and Geography Library, and the Illinois Natural Resources Geospatial Data Clearinghouse (ISGS 2009). Maps were available and obtained for years 1939, 1951, 1957, 1963, 1969, 1988, and 1998 (see Appendices 6 - 12).

RESULTS

Vascular Plant Species Present

A total of 255 species representing 75 plant families and 178 genera were found at Spring Bay Fen Nature Preserve (Appendices 13 and 14). Of these taxa, 26 (10.2%) were adventive to the site (see Appendix 14), with 24 representing introductions to North America, one representing an introduction to Illinois (*Maclura pomifera* - osage orange), and one representing an introduction into this region of Illinois (*Catalpa speciosa* - cigar tree). Pteridophytes (ferns and fern allies) accounted for 3 taxa, in 3 genera, and 3 families (Appendix 13). Among angiosperms, monocots accounted for 66 taxa, in 39 genera, and 13 families; and dicots, 186 taxa, in 135 genera, and 59 families (Appendix 13). The Cyperaceae, Asteraceae and Poaceae, represented 29.0% of the flora at Spring Bay Fen Nature Preserve, with 26 taxa (10.2%) in both the Cyperaceae and Asteraceae, and 22 taxa (8.6%) in the Poaceae. Other highly represented families include the Polygonaceae (12 taxa [4.7%]), and the Apiaceae, Lamiaceae, and Rosaceae, all with 9 taxa (3.5%), each. With respect to physiognomy of native species, forbs accounted for 55.0% of the

flora, grasses and sedges 18.8%, trees 10.0%, shrubs 7.9%, vines 6.5%, and ferns/fern allies 1.3% (Appendix 14). The native FQI for the entire preserve was 54.1 (51.2 with adventive taxa) and the native $\overline{C}$-value was 3.6 (3.2 with adventive taxa) (Appendix 14), indicating a natural area still possessing a high degree of natural integrity.

Threatened and Endangered Species

Two plant species listed as threatened or endangered in Illinois, by the Illinois Endangered Species Protection Board (Herkert and Ebinger 2002, IESPB 2005), were found in Spring Bay Fen Nature Preserve, and include: 1) *Boltonia decurrens* (Torr. & Gray) Wood (decurrent false aster) - listed as state threatened in Illinois and federally threatened in North America, and 2) *Filipendula rubra* (Hill) Robins. (queen of the prairie) - listed as state endangered in Illinois. Other species listed as threatened or endangered that have historically been reported from Spring Bay Fen Nature Preserve, include: *Cypripedium parviflorum* Salisb. (small yellow lady's-slipper orchid) - state endangered; and *Cypripedium reginae* Walt. (showy lady's-slipper orchid) - state endangered. Additionally, reported from this site, is *Cypripedium andrewsii* A. M. Fuller (Andrew's lady's-slipper orchid), which is not a state listed taxon, but is the reputed hybrid between the state threatened *Cypripedium candidum* and the state endangered *Cypripedium parviflorum*. Of these orchid species, only one - *Cypripedium reginae* - is known to be substantiated by a voucher specimen. A specimen is reported to exist for *C. andrewsii* (Mohlenbrock 1970), but the location of this specimen is uncertain. Though repeated searches were made during the 2007 and 2008 growing seasons, none of these orchid species were located. *Cypripedium reginae* was last observed at this site in the late 1990s (Simone pers comm 2007).

***Boltonia decurrens* (Torr. & Gray) Wood (decurrent false aster)** - Three individual plants (genets) of *Boltonia decurrens* were found in the open, grass and sedge dominated shoreline meadow habitat in the western portion of the preserve, along the Illinois River (Appendices 2 and 15). These individuals were vegetative when discovered in early September 2008, and were not observed flowering when revisited in mid September. The open aspect of this shoreline meadow habitat is maintained by periodic, seasonal flooding. This hydrologic disturbance regime also acts to create an environment conducive to the growth and survival of the decurrent false aster by reducing interspecific plant competition, and creating soil moisture and light conditions conducive to seed germination and subsequent seedling growth. Associate species of the decurrent false aster in this area included: *Ammannia robusta, Bidens cernua, Cyperus erythrorhizos, C. odoratus, C. strigosus, Echinochloa walteri, Eclipta prostrata, Eleocharis erythropoda, Hibiscus laevis, Ipomoea lacunosa, Lindernia dubia, Persicaria amphibium, P. hydropiperoides, P. lapathifolia, Leptochloa panicoides, Schoenoplectus pungens,* and *Xanthium strumarium* (see also Appendix 15).

***Filipendula rubra* (Hill) Robins. (queen of the prairie)** - Only three historical collections of *Filipendula rubra* are known from Woodford County, and were collected in 1891 (ILL), 1965 (ILL and ILLS), and 1977 (herbarium where deposited, unknown) (INPC |1970s|, ILLS 2009). The 1977 collection is from Spring Bay Fen, but the exact collection location of the two other specimens, is uncertain. With the exception of this 1977 collection, the only other documentation of *Filipendula rubra* occurring at this site, is a brief mention of this taxon being a characteristic species of the tall shrub fen natural community (although Spring Bay Fen is not mentioned specifically), in White and Madany (1978).

One population of *Filipendula rubra* (Appendices 16 and 17) was found on the east-central edge of the tall shrub fen community (Appendix 2), in an open area with very few shrubs. This population was somewhat patchy in distribution, and occurred in an area approximately 14 m². Due to the rhizomotous growth form of this taxon, it is uncertain how many individual plants (genets) were in this population. Many of the vegetative stems were undoubtedly ramets (multiple stems from the same genetic individual). At the time of collection in late July of 2007, there were 10 flowering stems and 4 fruiting stems (Appendix 16). Associate species occurring in this area included: *Apios americana, Aster puniceus, Caltha palustris, Carex hystericina, Chelone glabra, Eupatoriadelphus maculatus, Galium obtusum, Glyceria striata, Impatiens capensis, Iris shrevei, Lysimachia vulgaris*, Pilea fontana, Ranunculus recurvatus, Sagittaria latifolia, Silene nivea, Smilacina stellata, Solidago patula, Stachys hispida, Symplocarpus foetidus, Thelypteris palustris, Toxicodendron vernix,* and *Viburnum lentago* (see also Appendix 16).

Tall Shrub Fen

Within Spring Bay Fen Nature Preserve, the tall shrub fen community comprises approximately 2 ha (5 acres) of the total area, and occurs in the eastern portion of the preserve (Appendix 2). The entire eastern edge of the fen grades rapidly upslope into a dry, upland forest-type habitat, which apparently occurs entirely on fill-soil that was deposited on the eastern edge of the fen, sometime in the early to mid 1970s (IDC 1979). The specifics of this disturbance are not exactly clear, and details in IDC (1979) and Teater (1999) are not consistent. It is clear, however, that the lena muck soils, in which the tall shrub fen community occurs, extend further south than the soil map in Teater (1999) indicates (Appendix 18). It's possible that the delineations of loamy orthents soils (Teater 1999), which are the fill-soils in this area, do not entirely reflect the extent of fill activity in this area, and this would account for the discrepancies regarding the disturbance history on the eastern edge of this site. On all other boundaries, the fen community and associated lena muck soils, grade rather abruptly into the floodplain forest community, and associated slacwater silt loam soils.

The native FQI for the tall shrub fen was 38.8 (37.2 with adventive taxa) and the native $\overline{C}$-value was 4.0 (3.7 with adventive taxa) (Appendix 19). With respect to physiognomy of native species, forbs accounted for 60.9% of the flora, grasses and sedges 13.0%, shrubs 13.0%, vines 6.5%, trees 5.4%, and ferns/fern allies 1.1% (Appendix 19). As noted earlier, *Cypripedium reginae*, which was previously known to occur within this tall shrub fen community, could not be relocated, even after numerous searches were made throughout the general area where this species was once known to occur.

One hundred vascular plant species were observed within the fen community, and 92 of these were native (Appendix 19). Eight adventive species occurred within the fen community, and include: *Bromus tectorum* (cheat grass), *Lonicera* X *bella* (showy fly honeysuckle), *Lysimachia nummularia* (moneywort), *L. vulgaris* (garden loosestrife), *Mentha* X *piperita* (peppermint), *Phalaris arundinacea* (reed canary grass), *Phragmites australis* (common reed), and *Viburnum opulus* (European high-bush cranberry). With the exception of *Lysimachia nummularia, L. vulgaris* and *Mentha* X *piperita*, the remaining adventive species occurring in the tall shrub fen community, were infrequent. *Lysimachia nummularia* and *L. vulgaris* were common in the fen community (Appendix 20), and *L. vulgaris* was becoming particularly problematic. Patchy areas

within the fen were heavily infested with *L. vulgaris*, usually to the exclusion of native species, and this taxon appeared to be spreading. One colony of *Phragmites australis* was established in the northernmost portion of the fen (Appendix 2), and appeared to be doing well. *Mentha* X *piperita* was occasional within the fen community. Of these eight adventive species, only one (*Phragmites australis*) was noted as occurring within the fen community in 1977, during surveys for the Illinois Natural Areas Inventory (INAI) (Schwegman et al. 1977).

Of the 100 species found in the tall shrub fen community, 53 occurred within the ground flora sampling quadrats (Appendix 20). With respect to importance values (IV 200), the two most important ground flora species in the tall shrub fen, were *Apios americana* (ground nut) (IV 27.6%) and *Symplocarpus foetidus* (skunk cabbage) (IV 23.5%). Other species with high importance values included *Impatiens capensis* (spotted touch-me-not) (IV 18.4%), *Aster puniceus* (bristly aster) (IV 13.5%), *Sagittaria latifolia* (common arrowhead) (IV 11.4%), *Ribes americanum* (wild black current) (IV 11.2%), *Pilea fontana* (bog clearweed) (IV 9.6%), *Solidago patula* (rough-leaved goldenrod) (IV 9.3%), *Lysimachia vulgaris* (IV 9.0%), *Peltandra virginica* (arrow arum) (IV 6.9%), *Lysimachia nummularia* (IV 6.3%), and *Eupatoriadelphus maculatus* (spotted joe-pye-weed) (IV 5.7%) (see also Appendix 20).

Of the total shrubs and woody vines occurring within the entire preserve (n = 31; [shrubs = 22; woody vines = 9]) (Appendix 14), 18 occurred in the tall shrub fen (shrubs = 14; woody vines = 4) (Appendix 19). Of these, 7 shrub species occurred in the shrub and small sapling sampling area (400 m²) (Appendix 21). The most dominant shrub species was *Ribes americanum*, with 3600 stems/ha. Other important shrub species occurring in the fen, were *Viburnum lentago* (nannyberry) (1025 stems/ha), *Cornus stolonifera* (red osier dogwood) (650 stems/ha), and *Toxicodendron vernix* (poison sumac) (450 stems/ha) (see Appendix 21). The total density of shrubs in the fen community was 5975 stems/ha (Appendix 21). In areas where shrub densities were high, herbaceous ground flora diversity and abundance were greatly reduced.

Large saplings and trees were scarce within the tall shrub fen community, and represented by only 3 species - *Acer saccharinum* (silver maple), *Fraxinus lanceolata* (green ash), and *F. nigra* (black ash) (Appendices 22 and 23). Large saplings were represented by *Acer saccharinum* and *Fraxinus lanceolata* in the 2000 m² sampling area, and had densities of 10 stems/ha and 5 stems/ha, respectively (Appendix 22). Trees occurring within the 2000 m² sampling area were represented by two species - *Fraxinus lanceolata* and *F. nigra*. Stem densities for these two species were 60 stems/ha (IV = 174.3%) for *F. lanceolata*, and 15 stems/ha (IV = 25.7%) for *F. nigra* (Appendix 23).

Floodplain Forest

Approximately 7.3 ha (18 acres) of the area within Spring Bay Fen Nature Preserve is represented by closed canopy, floodplain forest. The majority of this community type occurs west of the tall shrub fen (Appendix 2), and closer to the river shoreline, this wooded community gradually grades into moist, open meadow/shoreline habitat. Diversity in this area was relatively high, but many species were infrequently encountered, and only represented by a few individuals. Scattered wet depressions as well as a small creek running through this area, added to the diversity of plants occurring here.

The native FQI for the floodplain forest was 35.8 (34.1 with adventive taxa) and the native $\overline{C}$-value was 3.3 (3.0 with adventive taxa) (Appendix 24). With respect to physiognomy of native species, forbs accounted for 55.0% of the flora, trees 16.7%, grasses and sedges 15.8%, vines 6.7%, shrubs 5.0%, and fern allies 0.8% (Appendix 24). One hundred thirty-one vascular plant species were observed in the floodplain forest community, and 119 of these were native (Appendix 24). Twelve adventive species (9.2%) occurred within this community, and include: *Alliaria petiolata* (garlic mustard), *Catalpa speciosa*, *Digitaria ischaemum* (smooth crab grass), *D. sanguinalis* (hairy crab grass), *Glechoma hederacea* (ground ivy), *Iris pseudacorus* (tall yellow iris), *Lysimachia nummularia*, *Maclura pomifera*, *Morus alba* (white mulberry), *Phalaris arundinacea*, *Persicaria cespitosa* (creeping smartweed), and *Taraxacum officinale* (common dandelion) (Appendix 24). Of these, five occurred in the ground flora sampling plots, and include: *Lysimachia nummularia* (IV 21.7%), *Alliaria petiolata* (IV 1.3%), *Morus alba* (IV 0.7%), *Phalaris arundinacea* (0.3%), and *Taraxacum officinale* (IV 0.2%) (Appendix 25).

Of the 131 species observed in the floodplain forest community, 58 occurred in the ground flora sampling plots (Appendix 25). The ground flora species with the highest importance values, were *Laportea canadensis* (wood nettle) (IV 46.7%), *Pilea pumila* (clearweed) (34.5%), and *Lysimachia nummularia* (21.7%) (Appendix 25). Other important species included *Aster ontarionis* (Ontario aster) (IV 8.4%), *Leersia virginica* (white grass) (IV 8.2%), *Persicaria punctata* (smartweed) (7.4%), *Acalypha rhomboidea* (three-seeded mercury) (IV 7.1%), *Boehmeria cylindrica* (false nettle) (IV 6.5%), *Viola missouriensis* (Missouri violet) (IV 5.5%), and *Impatiens capensis* (IV 5.2%) (Appendix 25).

Of the total shrubs and woody vines occurring within the entire preserve (n = 31; [shrubs = 22; woody vines = 9]) (Appendix 14), 10 occurred in the floodplain forest (shrubs = 6; woody vines = 4) (Appendix 24). Of these species, only one occurred within the shrub and small sapling sampling area (2000 m²) - *Amorpha fruticosa* (indigo bush), with 5 stems/ha (Appendix 26). Only one other species in this size class occurred in this area - *Fraxinus lanceolata* (25 stems/ha) (Appendix 26).

Within the large sapling size class, four species occurred in the 2000 m² sampling area, and included *Acer saccharinum, Cornus drummondii* (rough-leaved dogwood), *Fraxinus lanceolata*, and *Ulmus americana* (American elm) (Appendix 27). *Fraxinus lanceolata* and *Acer saccharinum* were the most dominant species in this size class, with 155 stems/ha and 95 stems/ha, respectively, and together comprised 90.9% of the relative density/ha (Appendix 27).

Six species occurred within the 2000 m² tree sampling plot, and included *Acer negundo, A. saccharinum, Fraxinus lanceolata, Platanus occidentalis* (sycamore), *Salix nigra* (black willow), and *Ulmus americana* (Appendix 28). The dominant species in this size class were *Acer saccharinum* and *Fraxinus lanceolata*, with 220 stems/ha (IV 120.6%) and 170 stems/ha (IV 54.7%), respectively (Appendix 28). These two species accounted for 175.3% of the total importance value (IV 200%).

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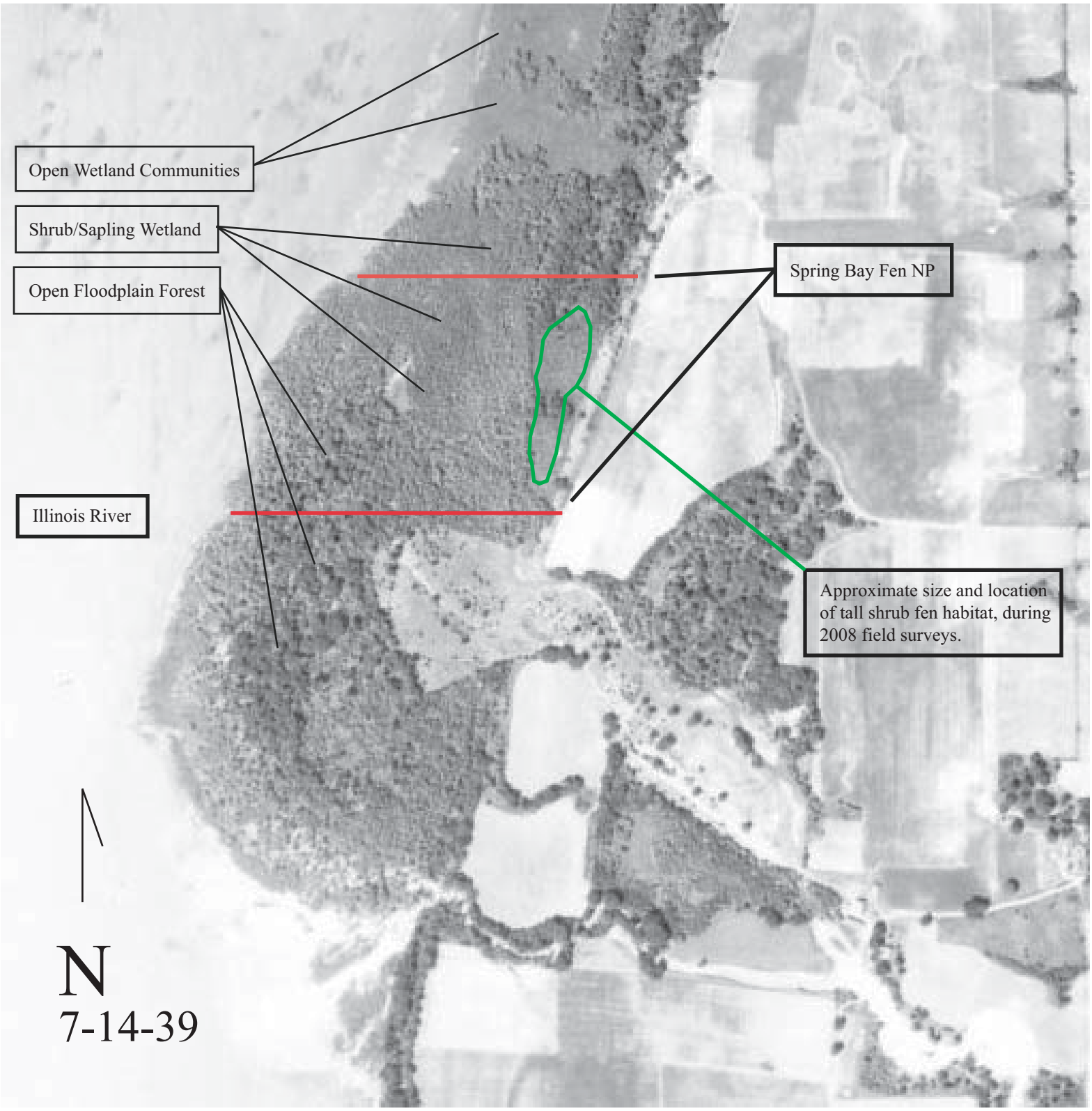
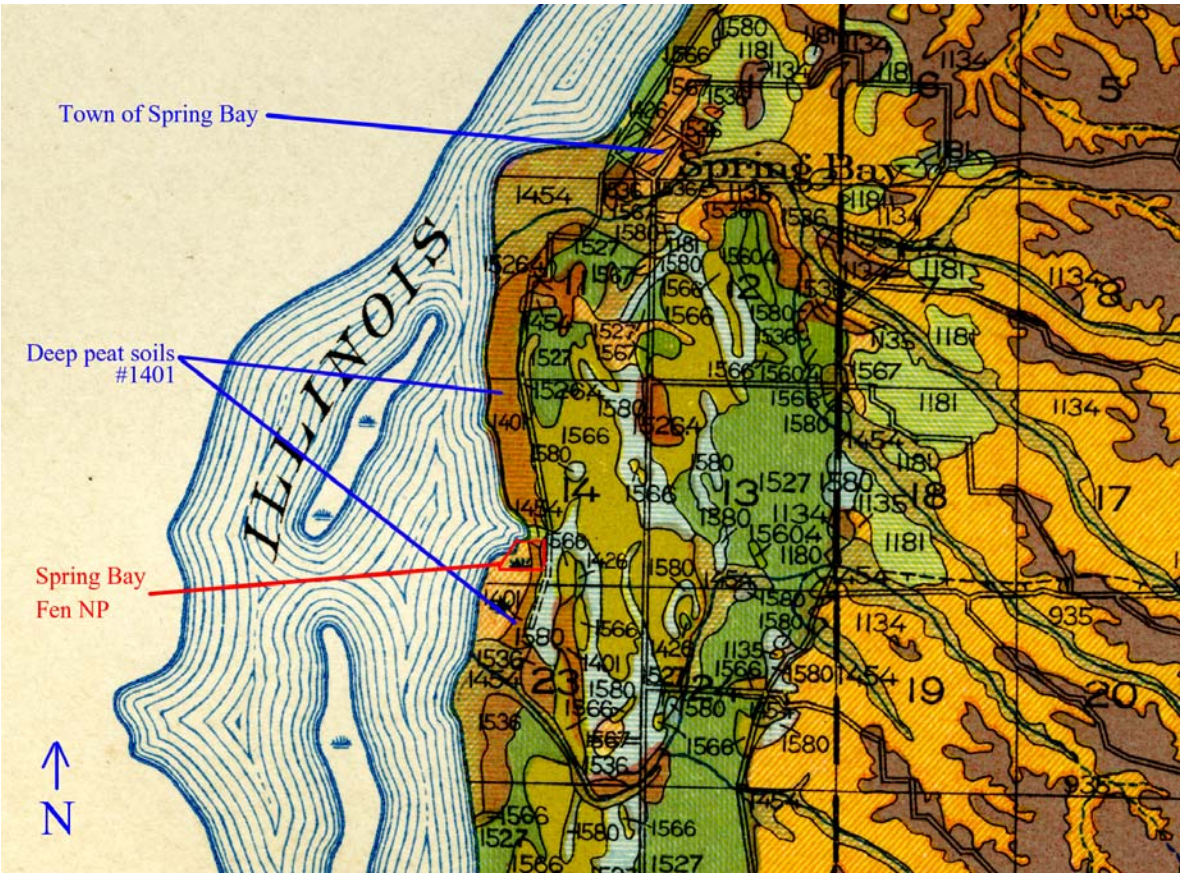
Appendix 2. Aerial photograph (taken on 10 July 2005) of Spring Bay Fen Nature Preserve, located in Woodford County, Illinois, showing preserve boundaries, approximate locations of vegetation communities, present and historic locations of endangered vascular plant species, and location of Phragmites australis (common reed).

Appendix 3. Aerial photograph taken on 14 July, 1939, of the immediate and surrounding area of what would later become Spring Bay Fen Nature Preserve, located in Woodford County, Illinois. Present day preserve boundaries are shown in red, and general vegetation patterns at the time the photograph was taken, are highlighted.



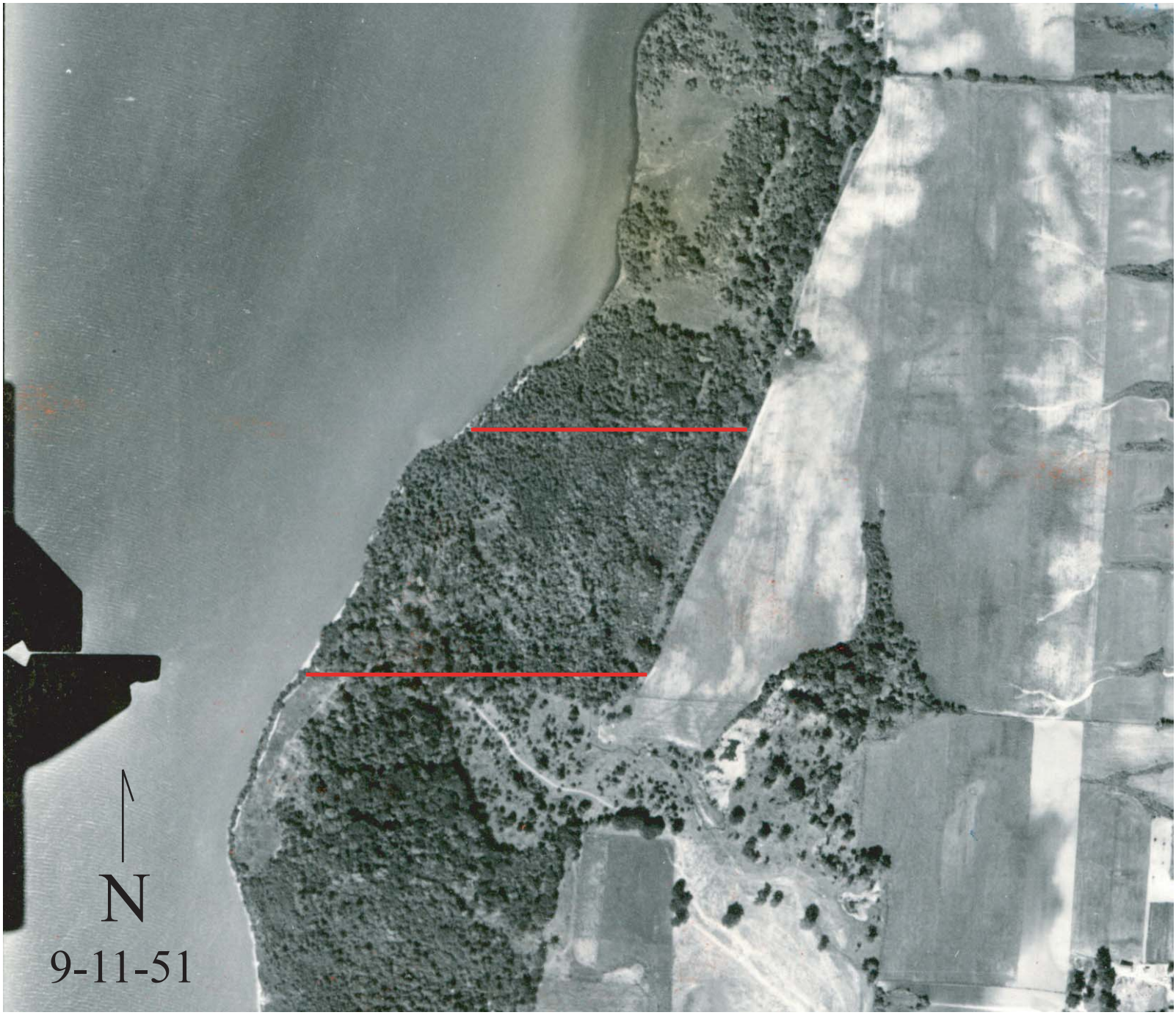
Appendix 4. Aerial photograph taken on 14 July, 1939, of the immediate and surrounding area of what would later become Spring Bay Fen Nature Preserve, located in Woodford County, Illinois. Present day preserve boundaries are shown in red, and the approximate size and location of the tall shrub fen community, as observed during 2008 field surveys, is highlighted in green.

Appendix 5. Soil map published in 1927 (Smith et al. 1927) of the immediate and surrounding area of what would later become Spring Bay Fen Nature Preserve, located in Woodford County, Illinois. Present day preserve boundaries are shown in red. Soils #1181 (green cross-hatching) and #1580 (light blue cross-hatching) east of the river, are wind and river deposited sands, respectively. Map shows features before the construction of the Illinois River lock and dam system.

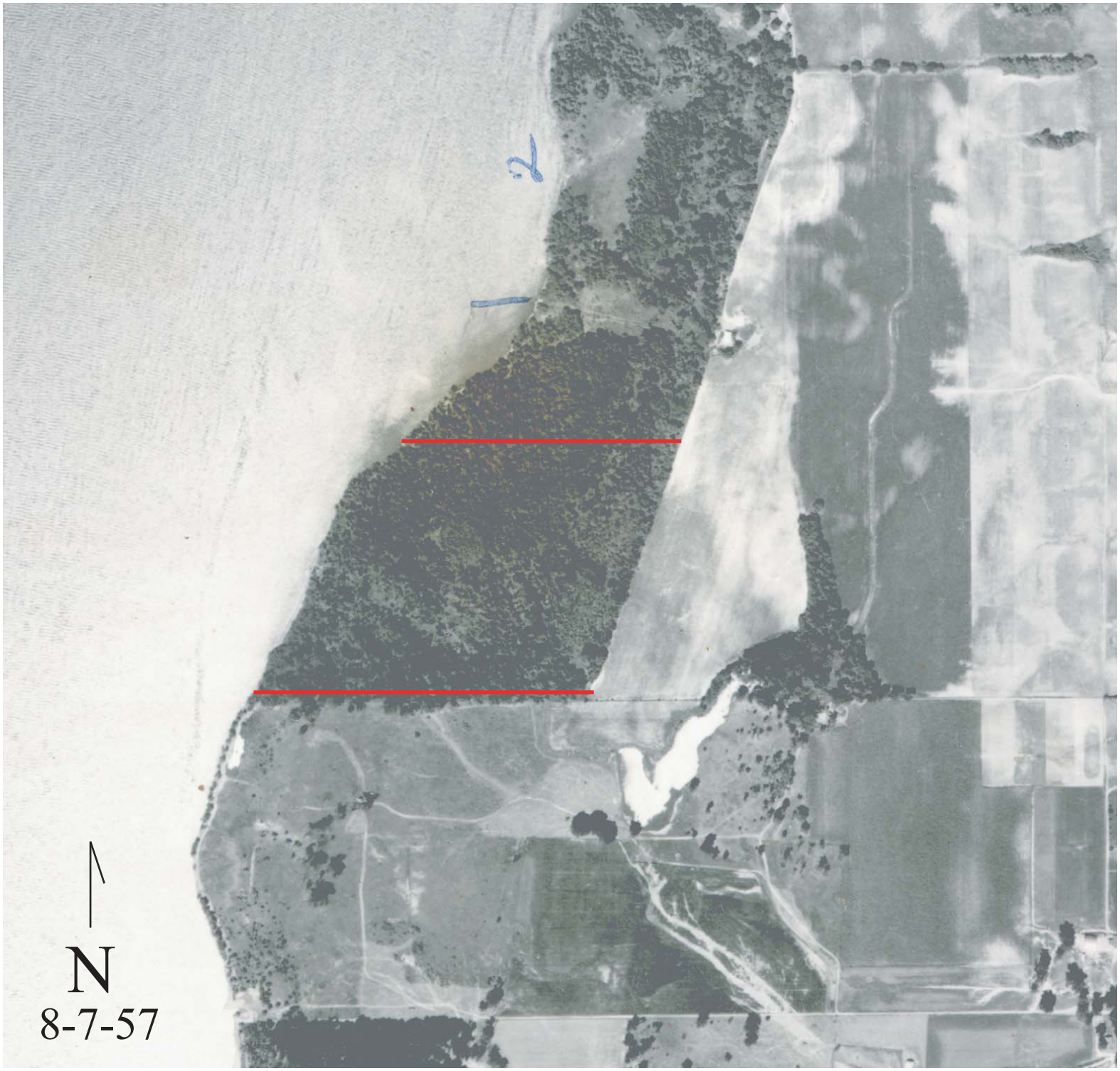


Appendix 6. Aerial photograph taken in 1939, of the immediate and surrounding area of what would later become Spring Bay Fen Nature Preserve, in Woodford County, Illinois. Preserve boundaries are shown in red.

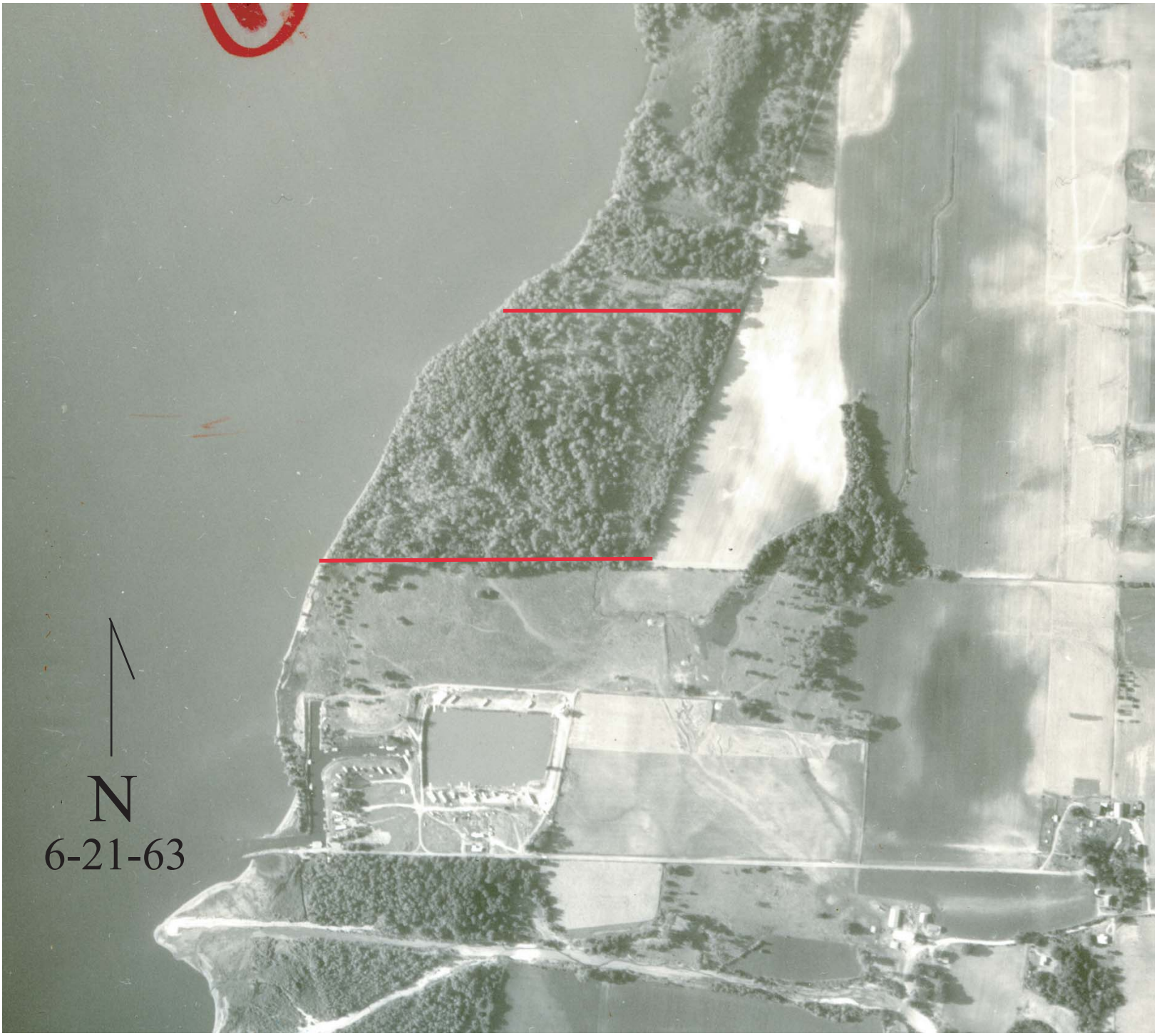
Appendix 7. Aerial photograph taken in 1951, of the immediate and surrounding area of what would later become Spring Bay Fen Nature Preserve, in Woodford County, Illinois. Preserve boundaries are shown in red.



Appendix 8. Aerial photograph taken in 1957, of the immediate and surrounding area of what would later become Spring Bay Fen Nature Preserve, in Woodford County, Illinois. Preserve boundaries are shown in red.

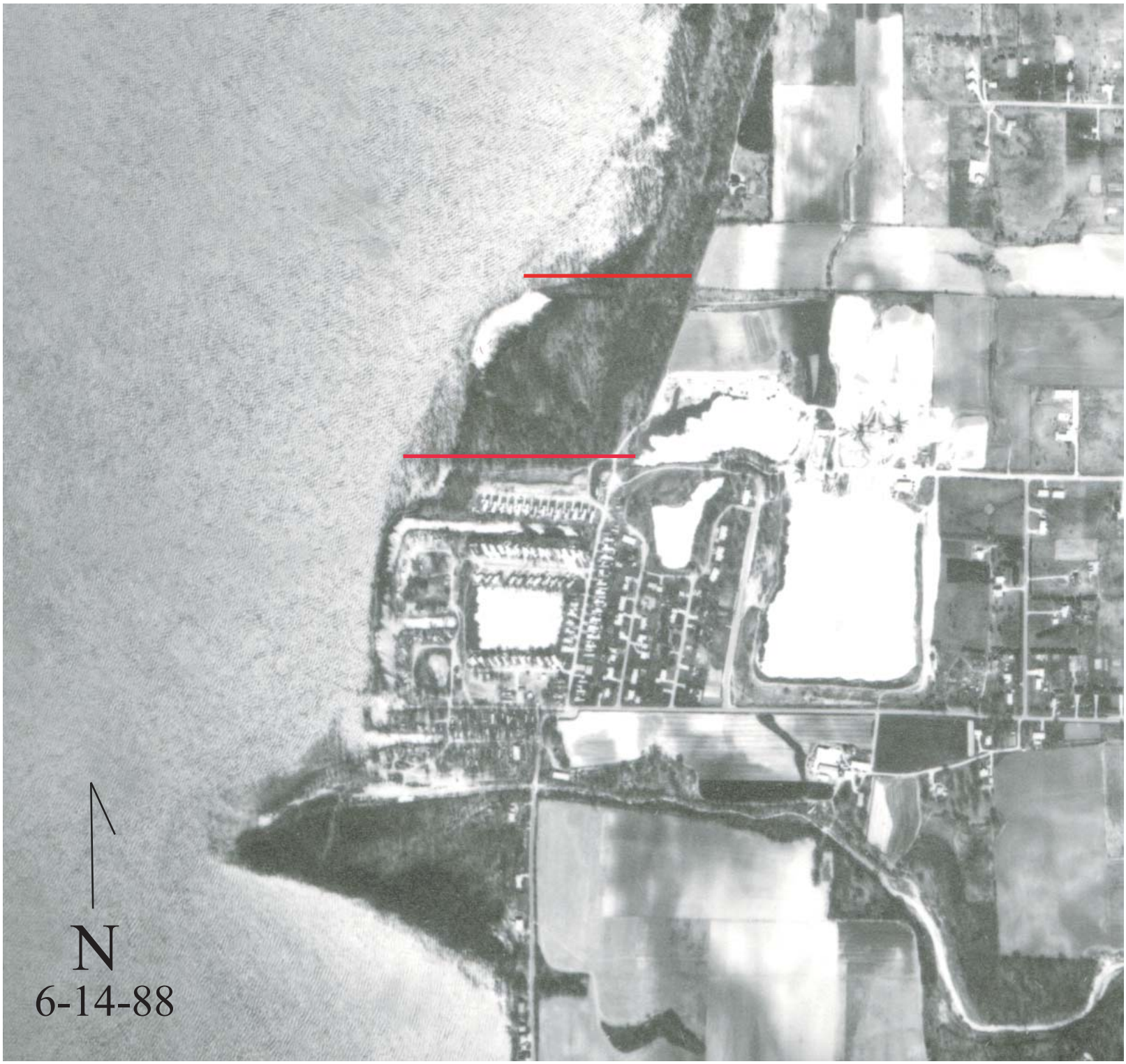


Appendix 9. Aerial photograph taken in 1963, of the immediate and surrounding area of what would later become Spring Bay Fen Nature Preserve, in Woodford County, Illinois. Preserve boundaries are shown in red.

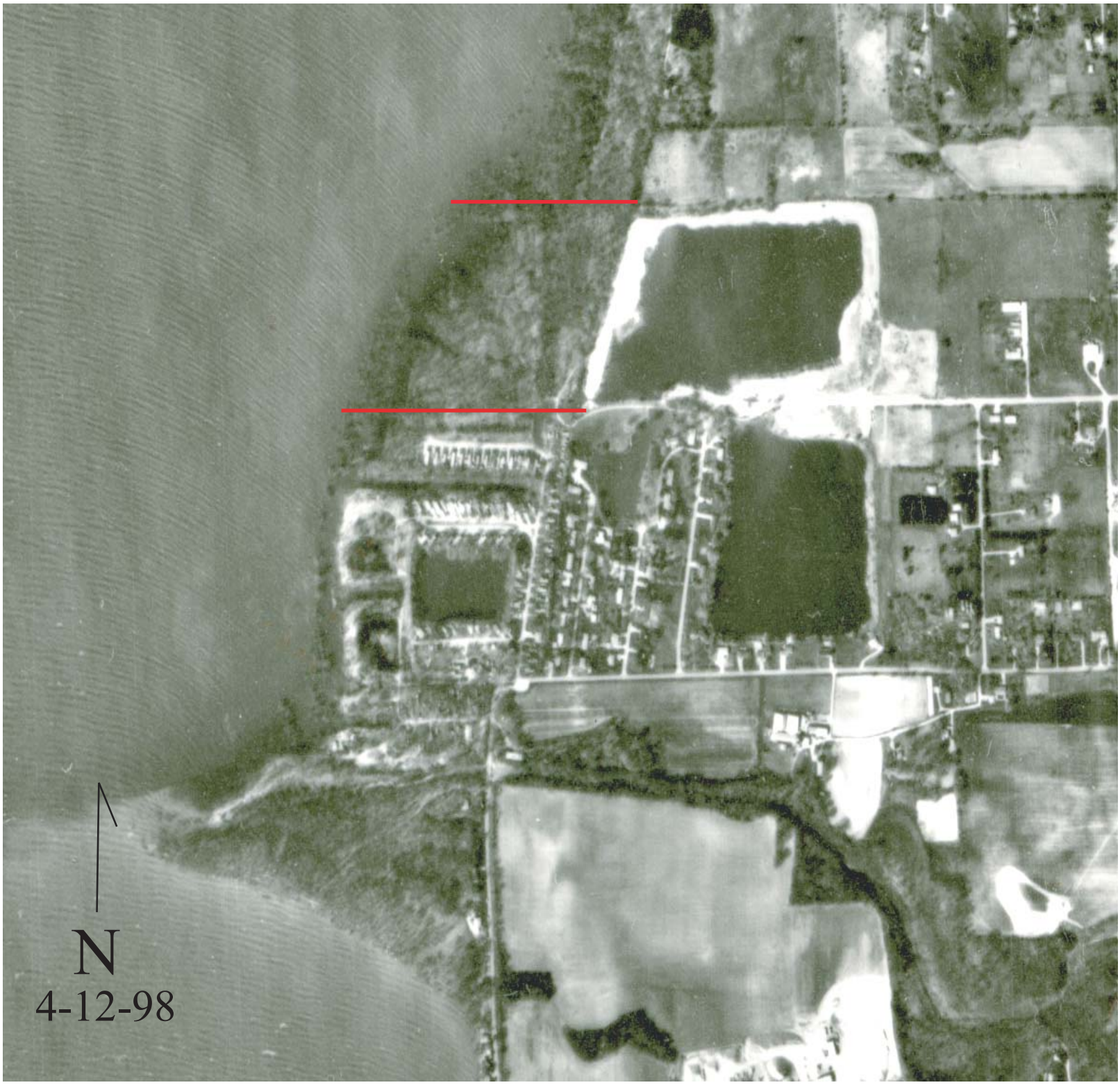


Appendix 10. Aerial photograph taken in 1969, of the immediate and surrounding area of what would later become Spring Bay Fen Nature Preserve, in Woodford County, Illinois. Preserve boundaries are shown in red.

Appendix 11. Aerial photograph taken in 1988, of the immediate and surrounding area of Spring Bay Fen Nature Preserve, in Woodford County, Illinois. Preserve boundaries are shown in red.



Appendix 12. Aerial photograph taken in 1998, of the immediate and surrounding area of Spring Bay Fen Nature Preserve, in Woodford County, Illinois. Preserve boundaries are shown in red.



Appendix 13. Vascular plant taxa encountered at Spring Bay Fen Nature Preserve, Woodford County, Illinois, during the 2007 and 2008 growing seasons. Pteridophytes are listed first, followed by angiosperms. Angiosperms are further divided into monocots and dicots. Familes, genera and species are arranged alphabetically within groups. Adventive taxa are indicated by an asterisk (*). Following the binomial and authority, the community type(s) in which each taxon occurred, is indicated by a 1, 2, 3, or 4. Numbers corresponding to community types are as follows: 1 = fen/seep; 2 = floodplain forest; 3 = open floodplain and shoreline areas; and 4 = degraded upland forest (including areas where filling-in of the seep has occurred). Nomenclature follows Mohlenbrock (2002). Collecting numbers are those of M. J. C. Murphy (M) and Loy R. Phillippe (P). All specimens are deposited in the Illinois Natural History Survey Herbarium (ILLS), Champaign, IL.

FERNS AND FERN-ALLIES

Equisetaceae

Equisetum arvense L.: 2, 3; M2648 & M2650

Ophioglossaceae

Botrychium virginianum (L.) Sw.: 4; M1909

Thelypteridaceae

Thelypteris palustris Schott var. *pubescens* (Laws.) Fern.: 1; M2196

ANGIOSPERMS

MONOCOTS

Alismataceae

Sagittaria latifolia Willd.: 1, 2, 3; M2440 & M3316

Araceae

Arisaema dracontium (L.) Schott: 2; M2660

Arisaema triphyllum (L.) Schott: 4; M1929

Peltandra virginica (L.) Schott & Endl.: 1, 2; P39185

Symplocarpus foetidus (L.) Nutt.: 1, 4; M1920

Commelinaceae

**Commelina communis* L.: 4; M3079

Cyperaceae

Bolboschoenus fluviatilis (Torr.) Sojak: 1; M2447

Carex albicans Willd. ex Spreng.: 4; M1912

Carex blanda Dewey: 2, 4; M1906

Carex conjuncta Boott: 1, 2; M2639

Carex emoryi Dewey: 2, 3; M2646 & M2655

Carex granularis Muhl.: 1, 2; M2649

Carex grayi Carey: 2; M3113

Carex grisea Wahl.: 2; M2637

Carex hystericina Muhl.: 1; M2173 & M2193

Carex jamesii Schwein.: 2; M2191

Carex lupulina Willd.: 2; M2458

Carex muskingumensis Schwein.: 2; M2465

Carex normalis Mack.: 2; M2189

Carex rosea Schk.: 2; M2673

Carex stipata Muhl.: 1; M2203

Cyperus erythrorhizos Muhl.: 3; M3326

Cyperus esculentus L.: 3; M3092

Cyperus odoratus L.: 3; M3327

Cyperus squarrosus L.: 3; M3094

Cyperus strigosus L.: 3; M3104 & M3319

Eleocharis erythropoda Steud.: 3; M3337

Fimbristylis autumnalis (L.) Roem. & Schultes: 3; M3328

Hemicarpha micrantha (Vahl) Pax: 3; M3329

Schoenoplectus acutus (Muhl.) A. Love & D. Love: 3; M3102

Schoenoplectus pungens (Vahl) Palla: 3; M2468

Scirpus atrovirens Willd.: 1; M2205

Appendix 13 continued

Dioscoreaceae
Dioscorea villosa L.: 2; M2664
Iridaceae
**Iris pseudacorus* L.: 2; M2642
Iris shrevei Small: 1, 2, 3; M2652
Sisyrinchium cf. *angustifolium* Mill.: 2; (sterile) M3342
Lemnaceae
Lemna minor L.: 1; M3344
Liliaceae
Smilacina racemosa (L.) Desf.: 4; M2341
Smilacina stellata (L.) Desf.: 1; M1901
Orchidaceae
Corallorhiza odontorhiza (Willd.) Nutt.: 4; M2475
Poaceae
Agrostis perennans (Walt.) Tuckerm.: 2; M3309
**Bromus tectorum* L.: 1; M1924
Cinna arundinacea L.: 1, 2; M2334
**Digitaria ischaemum* (Schreb.) Schreb.: 2, 3; M3341.2
**Digitaria sanguinalis* (L.) Scop.: 2, 3; M3341.1
**Echinochloa crus-galli* (L.) P. Beauv.: 3; M3318
Echinochloa walteri (Pursh) Heller: 3; M3317
Elymus villosus Muhl.: 4; M2169
Elymus virginicus L.: 2, 4; M2461
Eragrostis hypnoides (Lam.) BSP.: 3; M3335
Festuca subverticillata (Pers.) E.B. Alexeev.: 1, 2; M2190
Glyceria striata (Lam.) Hitchc.: 1, 2; M2180
Leersia oryzoides (L.) Swartz: 1, 2; M2445
Leersia virginica Willd.: 1, 2; M2204
Leptochloa panicoides (Presl) Hitchc.: 3; M3333
Muhlenbergia frondosa (Poir.) Fern. f. *commutata* (Scribn.) Fern.: 2; M3311
Panicum capillare L.: 3; M3325
Panicum virgatum L.: 3; M2467
**Phalaris arundinacea* L.: 1, 2; M2199
**Phragmites australis* (Cav.) Trin.: 1; Observed
Poa sylvestris Gray: 2; M2663
Spartina pectinata Link: 3; M2466
Sphenopholis intermedia (Rydb.) Rydb.: 1; M2328
Smilacaceae
Smilax tamnoides L. var. *hispida* (Muhl.) Fern.: 4; M2347
Sparganiaceae
Sparganium eurycarpum Englem.: 1; M2174
Typhaceae
Typha angustifolia L.: 3; M3315
DICOTS
Aceraceae
Acer negundo L. 2, 3, 4; M1916
Acer nigrum Michx.: 2; M3083
Acer saccharinum L.: 1, 2, 3; M1926
Amaranthaceae
Amaranthus tuberculatus (Moq.) J. Sauer: 3; M3320
Anacardiaceae
Rhus glabra L.: 1; M2206.2
Toxicodendron radicans (L.) Kuntze: 2, 3, 4; M2462
Toxicodendron vernix (L.) Kuntze: 1; M2172

Appendix 13 continued

Apiaceae
Chaerophyllum procumbens (L.) Crantz: 1, 2; M1919
Cicuta maculata L.: 1, 3; M2182
Cryptotaenia canadensis (L.) DC.: 1, 2; M2183
Osmorhiza claytonii (Michx.) C. B. Clarke: 2; M2672
Osmorhiza longistylis (Torr.) DC.: 2, 4; M1930
Oxypolis rigidior (L.) Raf.: 1; M2444
Sanicula canadensis L. var. *canadensis* : 4; M2168
Sanicula odorata (Raf.) Pryer & Phillippe: 4; M2628
Sium suave Walt.: 1, 3; M2651
Apocynaceae
Apocynum cannabinum L.: 2, 3; M3108
Aristolochiaceae
Asarum canadense L.: 4; M1905
Asclepiadaceae
Ampelamus albidus (Nutt.) Britt.: 3; Observed
Asclepias incarnata L.: 1, 3; M2469
Asteraceae
Ageratina altissima (L.) R.M. King & H. Robins.: 4; M2344
Ambrosia artemisiifolia L.: 3; M2659
Aster lateriflorus (L.) Britt.: 1, 2, 4; M2446
Aster ontarionis Wieg.: 1, 2, 3; M2460
Aster puniceus L.: 1; M2439
Bidens cernua L.: 2, 3; M3336
Bidens connata Muhl.: 2; Observed
Bidens frondosa L.: 1, 2, 3; M3305
Bidens vulgata Greene: 2; M3340
Boltonia decurrens (Torr. & Gray) Wood: 3; Observed
Cirsium muticum Michx.: 1; M2450
Conyza canadensis (L.) Cronq.: 2; M3112
Eclipta prostrata (L.) L.: 3; M3324
Erechtites hieracifolia (L.) Raf.: 2; Observed
Erigeron philadelphicus L.: 1, 2; M2638
Eupatoriadelphus maculatus (L.) R. M. King & H. Robins.: 1; M2331
Eupatorium perfoliatum L.: 1, 2; Observed
Eupatorium serotinum Michx.: 2, 3: Observed
Lactuca floridana (L.) Gaertn.: 2, 4; M3295
Rudbeckia laciniata L.: 1, 2; M2339
Silphium perfoliatum L.: 1; M2336
Solidago gigantea Ait.: 1, 2; M2635
Solidago patula Muhl.: 1; M2442
**Taraxacum officinale* Weber: 2; Observed
Verbesina alternifolia (L.) Britt.: 1, 2; M2641
Xanthium strumarium L.: 3; M3331
Balsaminaceae
Impatiens capensis Meerb.: 1, 2, 3, 4; M2441
Impatiens pallida Nutt.: 1; M3294
Berberidaceae
Podophyllum peltatum L.: 4; M1931
Bignoniaceae
Campsis radicans (L.) Seem.: 3; M2656
**Catalpa* cf. *speciosa* (sterile): 2; M2668
Boraginaceae
Hackelia virginiana (L.) I. M. Johnston: 2, 4; M2348

Appendix 13 continued

Brassicaceae
**Alliaria petiolata* (Bieb.) Cavara & Grande: 2, 4; M1911
Cardimine bulbosa (Muhl.) BSP.: 1; M1917
Cardamine pensylvanica Muhl.: 2; M2643
Iodanthus pinnatifidus (Michx.) Steud.: 2; M3100
Rorippa palustris (L.) Besser var. *palustris* : 3; M3101
Rorippa sessiliflora (Nutt.) A. Hitchc.: 3; M2657
Caesalpiniaceae
Cercis canadensis L.: 2; M2671
Gleditsia triacanthos L.: 2; M2647
Campanulaceae
Campanulastrum americanum (L.) Small: 4; M2345
Lobelia cardinalis L.: 2; M3308
Lobelia siphilitica L.: 1; M3343
Cannabinaceae
Humulus lupulus L.: 1; M2456
Caprifoliaceae
**Lonicera* X *bella* Zabel: 1, 4; M1902
**Lonicera maackii* (Rupr.) Maxim.: 4; M1908
Sambucus canadensis L.: 1, 2; M2452
Viburnum lentago L.: 1; M1923
**Viburnum opulus* L.: 1, 4; M1928
Caryophyllaceae
Silene nivea (Nutt.) Otth: 1, 2; M2324
Chenopodiaceae
**Chenopodium album* L.: 3; M2658
Convolvulaceae
Calystegia sepium (L.) R. Br.: 1, 2, 3; M2338
Ipomoea lacunosa L.: 2, 3; M3314
Ipomoea pandurata (L.) G. F. W. Mey.: 2, 3; M3312
Cornaceae
Cornus drummondii C. A. Mey.: 2, 4; M2170
Cornus obliqua Raf.: 1; M2330
Cornus sericea L.: 1; M1925 & M2178
Corylaceae
Corylus americana Walt.: 1; M2202
Cucurbitaceae
Sicyos angulatus L.: 2; M2644
Cuscutaceae
Cuscuta gronovii Willd.: 1; M2437 & M3310
Elaeagnaceae
**Elaeagnus umbellata* Thunb.: 4; M3080
Euphorbiaceae
Acalypha rhomboidea Raf.: 2, 3; M3089
Chamaesyce maculata (L.) Small: 3; M3334
Fabaceae
Amorpha fruticosa L.: 1, 2; M2335
Amphicarpaea bracteata (L.) Fern.: 2; M2667
Apios americana Medic.: 1; M2455
Fagaceae
Quercus imbricaria Michx.: 4; M3081
Quercus macrocarpa Michx.: 2; M2666

Appendix 13 continued

Grossulariaceae
Ribes americanum Mill.: 1; M1904
Ribes missouriense Nutt.: 4; M1907
Hydrophyllaceae
Ellisia nyctelea L.: 2; M2661
Hydrophyllum virginianum L.: 2; M2665
Hypericaceae
Hypericum cf. *punctatum* Lam.: 2; (sterile) Observed
Juglandaceae
Juglans nigra L.: 2; M2674
Lamiaceae
Agastache nepetoides (L.) Ktze.: 2; M3297
Blephilia hirsuta (Pursh) Bernh.: 1, 2; M2185
**Glechoma hederacea* L.: 2; M2634
Lycopus virginicus L.: 1, 2, 3; M2449
**Mentha* X *piperita* L.: 1; M2327
Physostegia speciosa (Sweet) Sweet: 2; M3300
Scutellaria lateriflora L.: 1, 2; M3301
Stachys hispida Pursh: 1; M2326
Teucrium canadense L. var. *canadense* : 1, 2; M2200
Lythraceae
Ammannia robusta Heer & Regel: 3; M3096 & M3322
Lythrum alatum Pursh: 3; M3105
**Lythrum salicaria* L.: 3; M3098
Malvaceae
Hibiscus laevis All.: 3; M2471
Menispermaceae
Menispermum canadense L.: 4; M2346
Moraceae
**Maclura pomifera* (Raf.) Schneider: 2; M3109
**Morus alba* L.: 2, 4; M2640
Morus rubra L.: 2; M2194
Oleaceae
Fraxinus americana L.: 2; M3307
Fraxinus lanceolata Borkh.: 1, 2, 3; M2333
Fraxinus nigra Marsh.: 1, 2; M2188
Fraxinus quadrangulata Michx.: 2; M3085
Onagraceae
Circaea lutetiana L. spp. *canadensis* Aschers. & Magnus: 2, 4; M2184
Epilobium coloratum Biehler.: 1, 2; M3302
Ludwigia palustris (L.) Ell.var. *americana* (DC.) Fern. & Griscom: 1, 3; M2438
Ludwigia peploides (HBK.) Raven var. *glabrescens* (Ktze.) Raven: 3; M3097
Oxalidaceae
Oxalis fontana Bunge: 2, 3; M3090
Phytolaccaceae
Phytolacca americana L.: 2; M3111
Platanaceae
Platanus occidentalis L.: 2, 3; M2463
Polemoniaceae
Phlox divaricata L.: 2; M2669

Appendix 13 continued

Polygonaceae
Antenoron virginianum (L.) Roberty & Vautier: 2; M3304
Fallopia scandens (L.) Holub.: 2; M3306
Persicaria amphibium (L.) S.F. Gray: 1, 3; M2448
**Persicaria cespitosa* (Blume) Nakai: 2; M3087
Persicaria hydropiperoides (Michx.) Small: 3; M3107
Persicaria lapathifolia (L.) S. F. Gray: 3; M2470
Persicaria pensylvanica (L.) Small: 2, 3; M3299
Persicaria punctata (Ell.) Small: 1, 2, 3; M2459
**Persicaria vulgaris* Webb & Moq.: 3; M2472
**Rumex crispus* L.: 3; M2654
Rumex orbiculatus Gray: 1; M2454
Rumex verticillatus L.: 2; M3313

Primulaceae
Lysimachia ciliata L.: 1, 2; M2197
**Lysimachia nummularia* L.: 1, 2; M2443
**Lysimachia vulgaris* L.: 1; M2175

Ranunculaceae
Anemone canadensis L.: 2; M2662
Caltha palustris L. 1; M1922
Clematis virginiana L.: 1; M2329
Ranunculus abortivus L.: 2, 4; M1903
Ranunculus recurvatus Poir.: 1; M1918
Ranunculus sceleratus L. 1; M1927
Thalictrum revolutum DC.: 1; M2179 & M2181

Rosaceae
Agrimonia pubescens Wallr.: 4; M2343
Crataegus mollis (Torr. & Gray) Scheele: 4; M3082
Filipendula rubra (Hill) Robins.: 1; M2322
Geum canadense Jacq.: 1, 2, 4; M2167
Prunus serotina Ehrh.: 2, 4; M1914
Prunus viringiana L. 1; M1921
Rosa setigera Michx.: 2; M2192
Rubus allegheniensis Porter: 4; M2631
Rubus occidentalis L.: 2; M3084

Rubiaceae
Cephalanthus occidentalis L.: 1, 2; M2171
Galium aparine L.: 4; M1910
Galium obtusum Bigel.: 1; M2198 & M2325
Galium triflorum Michx.: 1, 2; M2195 & M2323

Salicaceae
Populus deltoides Marsh.: 2, 3; M2632
Salix amygdaloides Anderss.: 2, 3; M3099
Salix discolor Muhl.: 1; M2177
Salix interior Rowlee: 3; M2653
Salix nigra Marsh.: 1, 2; M2201

Saururaceae
Saururus cernuus L.: 2; M2464

Saxifragaceae
Penthorum sedoides L.: 3; M3103

Appendix 13 continued

Scrophulariaceae
Chelone glabra L.: 1; M2451
Dasistoma macrophylla (Nutt.) Raf.: 4; Observed
Lindernia dubia (L.) Pennell: 3; M3093
Mimulus ringens L.: 3; M3106
Solanaceae
Solanum ptychanthum Dunal: 3; M3091
Tiliaceae
Tilia americana L.: 1; M2206.1
Ulmaceae
Celtis occidentalis L.: 4; M2629
Ulmus americana L.: 2, 4; M1913
Ulmus rubra Muhl.: 2; M2670
Urticaceae
Boehmeria cylindrica (L.) Sw.: 1, 2; M2187
Laportea canadensis (L.) Wedd.: 1, 2; M2453
Parietaria pensylvanica Willd.: 2; M3110
Pilea fontana (Lunell) Rydb.: 1; M2436
Pilea pumila (L.) Gray: 2; M3303
Urtica gracilis Ait.: 1, 2, 3; M2457
Verbenaceae
Phyla lanceolata (Michx.) Greene: 2, 3; M3088
Verbena urticifolia L.: 2, 4; M2186
Violaceae
Viola missouriensis Greene: 2; M2630 & M2645
Vitaceae
Parthenocissus quinquefolia (L.) Planch.: 1, 2, 4; M2176
Vitis riparia Michx.: 1, 2, 3, 4; M1915
Vitis vulpina L.: 2; M3086

Appendix 14. Floristic quality assessment of vascular plant taxa occurring in Spring Bay Fen Nature Preserve, Woodford County, Illinois. Abbreviations are as follows: **FQI** = floristic quality index; **C** = coefficient of conservatism; **W** = numeric wetness values associated with wetland categories (see end of appendix); **Wetness** = wetland classification category (see end of appendix); **Physiog.** = physiognomy (combination of structural attributes, life history and taxonomic classification). Single letter prefixes accompanying Forb, Grass, Sedge or Vine classifications are as follows: A = annual, H= herbaceous, P = perennial, W = woody. Taxa with scientific names in all capital letters are adventive to the region.

FLORISTIC QUALITY DATA	Native	229	89.8%	Adventive	26	10.2%
229 NATIVE SPECIES	Tree	23	9.0%	Tree	3	1.2%
255 Total Species	Shrub	18	7.1%	Shrub	4	1.6%
3.6 NATIVE MEAN C	W-Vine	9	3.5%	W-Vine	0	0.0%
3.2 W/Adventives	H-Vine	6	2.4%	H-Vine	0	0.0%
54.1 NATIVE FQI	P-Forb	87	34.1%	P-Forb	8	3.1%
51.2 W/Adventives	B-Forb	5	2.0%	B-Forb	1	0.4%
-1.7 NATIVE MEAN W	A-Forb	35	13.7%	A-Forb	4	1.6%
-1.4 W/Adventives	P-Grass	13	5.1%	P-Grass	2	0.8%
AVG: Fac. Wetland (-)	A-Grass	4	1.6%	A-Grass	4	1.6%
	P-Sedge	21	8.2%	P-Sedge	0	0.0%
	A-Sedge	5	2.0%	A-Sedge	0	0.0%
	Fern	3	1.2%			

C	Scientific Name	W	Wetness	Physiog.	Common Name
0	Acalypha rhomboidea	3	FACU	A-Forb	THREE-SEEDED MERCURY
1	Acer negundo	-2	FACW-	Tree	BOXELDER
6	Acer nigrum	5	UPL	Tree	BLACK MAPLE
1	Acer saccharinum	-3	FACW	Tree	SILVER MAPLE
4	Agastache nepetoides	3	FACU	P-Forb	YELLOW GIANT HYSSOP
4	Agrimonia pubescens	5	UPL	P-Forb	SOFT AGRIMONY
4	Agrostis perennans	1	FAC-	P-Grass	AUTUMN BENT GRASS
0	ALLIARIA PETIOLATA	0	FAC	B-Forb	GARLIC MUSTARD
1	Amaranthus tuberculatus	-5	OBL	A-Forb	TALL WATERHEMP
0	Ambrosia artemisiifolia	3	FACU	A-Forb	COMMON RAGWEED
5	Ammannia coccinea	-5	OBL	A-Forb	LONG-LEAVED AMMANNIA
6	Amorpha fruticosa	-4	FACW+	Shrub	FALSE INDIGO BUSH
4	Amphicarpa bracteata	0	FAC	H-Vine	HOG PEANUT
4	Anemone canadensis	-3	FACW	P-Forb	MEADOW ANEMONE
3	Apios americana	-3	FACW	H-Vine	GROUND NUT
2	Apocynum cannabinum	0	FAC	P-Forb	DOGBANE
4	Arisaema dracontium	-3	FACW	P-Forb	GREEN DRAGON
4	Arisaema triphyllum	-2	FACW-	P-Forb	INDIAN TURNIP
5	Asarum canadense	5	UPL	P-Forb	CANADA WILD GINGER
4	Asclepias incarnata	-5	OBL	P-Forb	SWAMP MILKWEED
2	Aster lateriflorus	-2	FACW-	P-Forb	SIDE-FLOWERING ASTER
4	Aster ontarionis	0	FAC	P-Forb	ONTARIO ASTER
7	Aster puniceus	-5	OBL	P-Forb	BRISTLY ASTER
2	Bidens cernua	-5	OBL	A-Forb	NODDING BUR MARIGOLD
2	Bidens connata	-5	OBL	A-Forb	PURPLESTEMMED TICKSEED
1	Bidens frondosa	-3	FACW	A-Forb	COMMON BEGGAR'S TICKS
0	Bidens vulgata	-3	FACW	A-Forb	TALL BEGGAR'S TICKS
5	Blephilia hirsuta	4	FACU-	P-Forb	WOOD MINT
3	Boehmeria cylindrica	-5	OBL	P-Forb	FALSE NETTLE
4	Boltonia decurrens	-5	OBL	P-Forb	ILLINOIS FALSE ASTER
4	Botrychium virginianum	3	FACU	Fern	RATTLESNAKE FERN
0	BROMUS TECTORUM	5	UPL	A-Grass	CHEAT GRASS
7	Caltha palustris	-5	OBL	P-Forb	COWSLIP

Appenidx 14 continued

C	Scientific Name	W	Wetness	Physiog.	Common Name
1	Calystegia sepium	0	FAC	P-Forb	AMERICAN BINDWEED
4	Campanula americana	0	FAC	A-Forb	AMERICAN BELLFLOWER
2	Campsis radicans	0	FAC	W-Vine	TRUMPET CREEPER
5	Cardamine bulbosa	-5	OBL	P-Forb	BULB BITTERCRESS
3	Cardamine pensylvanica	-4	FACW+	B-Forb	BITTER CRESS
5	Carex artitecta	5	UPL	P-Sedge	BLUNT-SCALED OAK SEDGE
2	Carex blanda	0	FAC	P-Sedge	COMMON WOOD SEDGE
5	Carex conjuncta	-3	FACW	P-Sedge	GREEN-HEADED FOX SEDGE
6	Carex emoryi	-5	OBL	P-Sedge	RIVERBANK SEDGE
2	Carex granularis	-4	FACW+	P-Sedge	PALE SEDGE
6	Carex grayi	-4	FACW+	P-Sedge	COMMON BUR SEDGE
3	Carex grisea	5	UPL	P-Sedge	WOOD GRAY SEDGE
6	Carex hystericina	-5	OBL	P-Sedge	PORCUPINE SEDGE
4	Carex jamesii	5	UPL	P-Sedge	GRASS SEDGE
5	Carex lupulina	-5	OBL	P-Sedge	COMMON HOP SEDGE
6	Carex muskingumensis	-5	OBL	P-Sedge	SWAMP OVAL SEDGE
4	Carex normalis	-3	FACW	P-Sedge	SPREADING OVAL SEDGE
5	Carex rosea	5	UPL	P-Sedge	CURLY-STYLED WOOD SEDGE
2	Carex stipata	-5	OBL	P-Sedge	COMMON FOX SEDGE
0	CATALPA cf. SPECIOSA (sterile)	3	FACU	Tree	CIGAR TREE
3	Celtis occidentalis	1	FAC-	Tree	HACKBERRY
4	Cephalanthus occidentalis	-5	OBL	Shrub	BUTTONBUSH
3	Cercis canadensis	3	FACU	Tree	EASTERN REDBUD
1	Chaerophyllum procumbens	-1	FAC+	A-Forb	STREAMBANK CHERVIL
0	Chamaesyce maculata	4	FACU-	A-Forb	NODDING SPURGE
7	Chelone glabra	-5	OBL	P-Forb	WHITE TURTLEHEAD
0	CHENOPODIUM ALBUM	1	FAC-	A-Forb	LAMB'S QUARTERS
4	Cicuta maculata	-5	OBL	B-Forb	WATER HEMLOCK
5	Cinna arundinacea	-3	FACW	P-Grass	COMMON WOOD REED
2	Circaea lutetiana v. canadensis	3	FACU	P-Forb	ENCHANTER'S NIGHTSHADE
9	Cirsium muticum	-5	OBL	B-Forb	FEN THISTLE
3	Clematis virginiana	0	FAC	W-Vine	VIRGIN'S BOWER
0	COMMELINA COMMUNIS	0	FAC	A-Forb	COMMON DAY FLOWER
0	Conyza canadensis	1	FAC-	A-Forb	HORSEWEED
6	Corallorhiza odontorhiza	5	UPL	P-Forb	FALL CORAL ROOT
2	Cornus drummondii	0	FAC	Shrub	ROUGH-LEAVED DOGWOOD
4	Cornus obliqua	-5	OBL	Shrub	PALE DOGWOOD
4	Cornus stolonifera	-3	FACW	Shrub	RED OSIER DOGWOOD
4	Corylus americana	0	FAC	Shrub	AMERICAN FILBERT
2	Crataegus mollis	-2	FACW-	Tree	DOWNY HAWTHORN
1	Cryptotaenia canadensis	0	FAC	P-Forb	HONEWORT
2	Cuscuta gronovii	-3	FACW	A-Forb	COMMON DODDER
1	Cynanchum laeve	0	FAC	W-Vine	BLUE VINE
2	Cyperus aristatus	-5	OBL	A-Sedge	AWNED FLAT SEDGE
1	Cyperus erythrorhizos	-5	OBL	A-Sedge	RED-ROOTED NUT SEDGE
0	Cyperus esculentus	-3	FACW	P-Sedge	FIELD NUT SEDGE
1	Cyperus ferruginescens	-5	OBL	A-Sedge	RUSTY NUT SEDGE
0	Cyperus strigosus	-3	FACW	P-Sedge	LONG-SCALED NUT SEDGE
7	Dasistoma macrophylla	4	FACU-	P-Forb	MULLEIN FOXGLOVE

Appenidx 14 continued

C	Scientific Name	W	Wetness	Physiog.	Common Name
0	DIGITARIA ISCHAEMUM	3	FACU	A-Grass	SMOOTH CRAB GRASS
0	DIGITARIA SANGUINALIS	3	FACU	A-Grass	HAIRY CRAB GRASS
4	Dioscorea villosa	1	FAC-	H-Vine	WILD YAM
0	ECHINOCHLOA CRUSGALLI	-3	FACW	A-Grass	BARNYARD GRASS
5	Echinochloa walteri	-5	OBL	A-Grass	SALT-MARSH COCKSPUR GRASS
2	Eclipta prostrata	-3	FACW	A-Forb	YERBA DE TAJO
0	ELAEAGNUS UMBELLATA	5	UPL	Shrub	AUTUMN OLIVE
3	Eleocharis erythropoda	-5	OBL	P-Sedge	RED-ROOTED SPIKE RUSH
1	Ellisia nyctelea	-1	FAC+	A-Forb	AUNT LUCY
4	Elymus villosus	3	FACU	P-Grass	SILKY WILD RYE
4	Elymus virginicus	-2	FACW-	P-Grass	VIRGINIA WILD RYE
3	Epilobium coloratum	-5	OBL	P-Forb	CINNAMON WILLOW HERB
0	Equisetum arvense	0	FAC	Fern	COMMON HORSETAIL
5	Eragrostis hypnoides	-5	OBL	A-Grass	CREEPING LOVE GRASS
2	Erechtites hieracifolia	3	FACU	A-Forb	FIREWEED
3	Erigeron philadelphicus	-3	FACW	P-Forb	MARSH FLEABANE
2	Eupatorium altissimum	3	FACU	P-Forb	TALL BONESET
5	Eupatorium maculatum	-5	OBL	P-Forb	SPOTTED JOE PYE WEED
4	Eupatorium perfoliatum	-4	FACW+	P-Forb	COMMON BONESET
1	Eupatorium serotinum	-1	FAC+	P-Forb	LATE BONESET
5	Festuca obtusa	2	FACU+	P-Grass	NODDING FESCUE
10	Filipendula rubra	-4	FACW+	P-Forb	QUEEN OF THE PRAIRIE
6	Fimbristylis autumnalis	-4	FACW+	A-Sedge	AUTUMN SEDGE
4	Fraxinus americana	3	FACU	Tree	WHITE ASH
8	Fraxinus nigra	-4	FACW+	Tree	BLACK ASH
2	Fraxinus pennsylvanica v. subintegerrima	-3	FACW	Tree	GREEN ASH
6	Fraxinus quadrangulata	5	UPL	Tree	BLUE ASH
0	Galium aparine	3	FACU	A-Forb	ANNUAL BEDSTRAW
5	Galium obtusum	-4	FACW+	P-Forb	WILD MADDER
4	Galium triflorum	2	FACU+	P-Forb	SWEET-SCENTED BEDSTRAW
2	Geum canadense	0	FAC	P-Forb	WHITE AVENS
0	GLECHOMA HEDERACEA	3	FACU	P-Forb	GROUND IVY
2	Gleditsia triacanthos	0	FAC	Tree	HONEY LOCUST
4	Glyceria striata	-5	OBL	P-Grass	FOWL MANNA GRASS
1	Hackelia virginiana	1	FAC-	P-Forb	STICKSEED
4	Hibiscus laevis	-5	OBL	P-Forb	HALBERD-LEAVED ROSE MALLOW
2	Humulus lupulus	3	FACU	H-Vine	COMMON HOPS
5	Hydrophyllum virginianum	-2	FACW-	P-Forb	VIRGINIA WATERLEAF
3	Hypericum punctatum	-1	FAC+	P-Forb	SPOTTED ST. JOHN'S WORT
2	Impatiens capensis	-3	FACW	A-Forb	SPOTTED TOUCH-ME-NOT
4	Impatiens pallida	-3	FACW	A-Forb	PALE TOUCH-ME-NOT
6	Iodanthus pinnatifidus	-3	FACW	P-Forb	VIOLET CRESS
1	Ipomoea lacunosa	-3	FACW	A-Forb	SMALL MORNING GLORY
2	Ipomoea pandurata	3	FACU	P-Forb	WILD SWEET POTATO
0	IRIS PSEUDACORUS	-5	OBL	P-Forb	TALL YELLOW IRIS
5	Iris shrevei	-5	OBL	P-Forb	SOUTHERN BLUE FLAG
4	Juglans nigra	3	FACU	Tree	BLACK WALNUT
4	Lactuca floridana	1	FAC-	B-Forb	BLUE LETTUCE
2	Laportea canadensis	-3	FACW	P-Forb	CANADA WOOD NETTLE

Appenidx 14 continued

C	Scientific Name	W	Wetness	Physiog.	Common Name
3	Leersia oryzoides	-5	OBL	P-Grass	RICE CUT GRASS
4	Leersia virginica	-3	FACW	P-Grass	WHITE GRASS
3	Lemna minor	-5	OBL	A-Forb	SMALL DUCKWEED
9	Leptochloa panicoides	-5	OBL	A-Grass	SALT MEADOW GRASS
5	Lindernia dubia	-5	OBL	A-Forb	FALSE PIMPERNEL
6	Lobelia cardinalis	-5	OBL	P-Forb	CARDINAL FLOWER
4	Lobelia siphilitica	-4	FACW+	P-Forb	GREAT BLUE LOBELIA
0	LONICERA MAACKII	5	UPL	Shrub	AMUR HONEYSUCKLE
0	LONICERA X BELLA	3	FACU	Shrub	SHOWY FLY HONEYSUCKLE
4	Ludwigia palustris v. americana	-5	OBL	P-Forb	MARSH PURSLANE
5	Ludwigia peploides v. glabrescens	-5	OBL	P-Forb	CREEPING PRIMROSE WILLOW
5	Lycopus virginicus	-5	OBL	P-Forb	BUGLE WEED
4	Lysimachia ciliata	-3	FACW	P-Forb	FRINGED LOOSESTRIFE
0	LYSIMACHIA NUMMULARIA	-4	FACW+	P-Forb	MONEYWORT
0	LYSIMACHIA VULGARIS	-2	FACW-	P-Forb	GARDEN LOOSESTRIFE
5	Lythrum alatum	-5	OBL	P-Forb	WINGED LOOSESTRIFE
0	LYTHRUM SALICARIA	-5	OBL	P-Forb	PURPLE LOOSESTRIFE
0	MACLURA POMIFERA	3	FACU	Tree	HEDGE APPLE
4	Menispermum canadense	-1	FAC+	W-Vine	MOONSEED
0	MENTHA X PIPERITA	-5	OBL	P-Forb	PEPPERMINT
5	Mimulus ringens	-5	OBL	P-Forb	MONKEY FLOWER
0	MORUS ALBA	0	FAC	Tree	WHITE MULBERRY
4	Morus rubra	1	FAC-	Tree	RED MULBERRY
3	Muhlenbergia frondosa	-3	FACW	P-Grass	COMMON SATIN GRASS
3	Osmorhiza claytonii	4	FACU-	P-Forb	HAIRY SWEET CICELY
3	Osmorhiza longistylis	4	FACU-	P-Forb	ANISE ROOT
0	Oxalis stricta	3	FACU	P-Forb	TALL WOOD SORREL
7	Oxypolis rigidior	-5	OBL	P-Forb	COWBANE
0	Panicum capillare	0	FAC	A-Grass	OLD WITCH GRASS
4	Panicum virgatum	-1	FAC+	P-Grass	PRAIRIE SWITCH GRASS
2	Parietaria pensylvanica	3	FACU	A-Forb	PENNSYLVANIA PELLITORY
2	Parthenocissus quinquefolia	1	FAC-	W-Vine	VIRGINIA CREEPER
8	Peltandra virginica	-5	OBL	P-Forb	ARROW ARUM
2	Penthorum sedoides	-5	OBL	P-Forb	DITCH STONECROP
0	PHALARIS ARUNDINACEA	-4	FACW+	P-Grass	REED CANARY GRASS
0	PHRAGMITES AUSTRALIS	-4	FACW+	P-Grass	COMMON REED
5	Phlox divaricata	3	FACU	P-Forb	BLUE PHLOX
1	Phyla lanceolata	-5	OBL	P-Forb	FOG FRUIT
6	Physostegia virginiana	-3	FACW	P-Forb	OBEDIENT PLANT
1	Phytolacca americana	1	FAC-	P-Forb	POKEWEED
6	Pilea fontana	-3	FACW	A-Forb	BOG CLEARWEED
3	Pilea pumila	-3	FACW	A-Forb	CANADA CLEARWEED
3	Platanus occidentalis	-3	FACW	Tree	BUTTONWOOD
5	Poa sylvestris	0	FAC	P-Grass	WOODLAND BLUE GRASS
4	Podophyllum peltatum	3	FACU	P-Forb	MAY APPLE
3	Polygonum amphibium	-5	OBL	P-Forb	WATER KNOTWEED
0	POLYGONUM CESPITOSUM v. LONGISETUM	5	UPL	A-Forb	CREEPING SMARTWEED
4	Polygonum hydropiperoides	-5	OBL	P-Forb	MILD WATER PEPPER
0	Polygonum lapathifolium	-4	FACW+	A-Forb	CURTTOP LADY'S THUMB

Appenidx 14 continued

C	Scientific Name	W	Wetness	Physiog.	Common Name
1	Polygonum pensylvanicum	-4	FACW+	A-Forb	PINKWEED
0	POLYGONUM PERSICARIA	-3	FACW	A-Forb	LADY'S THUMB
3	Polygonum punctatum	-5	OBL	A-Forb	SMARTWEED
2	Polygonum scandens	0	FAC	H-Vine	CLIMBING FALSE BUCKWHEAT
3	Polygonum virginianum	0	FAC	P-Forb	VIRGINIA KNOTWEED
2	Populus deltoides	-1	FAC+	Tree	EASTERN COTTONWOOD
1	Prunus serotina	3	FACU	Tree	WILD BLACK CHERRY
3	Prunus virginiana	1	FAC-	Shrub	COMMON CHOKE CHERRY
2	Quercus imbricaria	1	FAC-	Tree	JACK OAK
5	Quercus macrocarpa	1	FAC-	Tree	BURR OAK
1	Ranunculus abortivus	-2	FACW-	A-Forb	LITTLE-LEAF BUTTERCUP
5	Ranunculus recurvatus	-3	FACW	A-Forb	HOOKED BUTTERCUP
3	Ranunculus sceleratus	-5	OBL	A-Forb	CURSED CROWFOOT
1	Rhus glabra	5	UPL	Shrub	SMOOTH SUMAC
5	Ribes americanum	-3	FACW	Shrub	WILD BLACK CURRENT
2	Ribes missouriense	5	UPL	Shrub	MISSOURI GOOSEBERRY
4	Rorippa palustris	-5	OBL	A-Forb	MARSH YELLOW CRESS
3	Rorippa sessiliflora	-5	OBL	A-Forb	SESSILE-FLOWERED CRESS
5	Rosa setigera	2	FACU+	Shrub	ILLINOIS ROSE
2	Rubus allegheniensis	2	FACU+	Shrub	COMMON BLACKBERRY
2	Rubus occidentalis	3	FACU	Shrub	BLACK RASPBERRY
3	Rudbeckia laciniata	-4	FACW+	P-Forb	WILD GOLDEN GLOW
0	RUMEX CRISPUS	-1	FAC+	P-Forb	CURLY DOCK
7	Rumex orbiculatus	-5	OBL	P-Forb	GREAT WATER DOCK
5	Rumex verticillatus	-5	OBL	P-Forb	SWAMP DOCK
4	Sagittaria latifolia	-5	OBL	P-Forb	COMMON ARROWHEAD
4	Salix amygdaloides	-3	FACW	Tree	PEACH-LEAVED WILLOW
4	Salix discolor	-3	FACW	Shrub	PUSSY WILLOW
1	Salix exigua	-5	OBL	Shrub	SANDBAR WILLOW
3	Salix nigra	-5	OBL	Tree	BLACK WILLOW
2	Sambucus canadensis	4	FACU-	Shrub	COMMON ELDER
4	Sanicula canadensis	2	FACU+	B-Forb	CANADIAN BLACK SNAKEROOT
2	Sanicula gregaria	-1	FAC+	P-Forb	CLUSTERED BLACK SNAKEROOT
5	Saururus cernuus	-5	OBL	P-Forb	LIZARD'S TAIL
6	Scirpus acutus	-5	OBL	P-Sedge	HEARD-STEMMED BULRUSH
3	Scirpus americanus	-5	OBL	P-Sedge	CHAIRMAKER'S RUSH
4	Scirpus atrovirens	-5	OBL	P-Sedge	DARK GREEN RUSH
3	Scirpus fluviatilis	-5	OBL	P-Sedge	RIVER BULRUSH
7	Scirpus micranthus	-5	OBL	A-Sedge	SMALL-FLOWERED RUSH
4	Scutellaria lateriflora	-5	OBL	P-Forb	MAD-DOG SKULLCAP
3	Sicyos angulatus	-2	FACW-	H-Vine	BUR CUCUMBER
8	Silene nivea	-3	FACW	P-Forb	SNOWY CAMPION
4	Silphium perfoliatum	-2	FACW-	P-Forb	CUP PLANT
5	Sisyrinchium angustifolium	-2	FACW-	P-Forb	STOUT BLUE-EYED GRASS
5	Sium suave	-5	OBL	P-Forb	WATER PARSNIP
4	Smilacina racemosa	3	FACU	P-Forb	FEATHERY FALSE SOLOMON SEAL
5	Smilacina stellata	1	FAC-	P-Forb	STARRY FALSE SOLOMON SEAL
3	Smilax hispida	0	FAC	W-Vine	BRISTLY GREEN BRIER
0	Solanum ptycanthum	4	FACU-	A-Forb	BLACK NIGHTSHADE

Appendix 16. Threatened and endangered species Element Occurrence Record for *Filipendula rubra* (Hill) Robins., Woodford County, Illinois.

Taxon: *Filipendula rubra* (Hill) Robins.	**Status:** State Endangered
Project Area: Spring Bay Fen Nature Preserve	**County:** Woodford
Date: 24 July 2007	
Distance from Edge of Pavement: N/A	**Population Size:** 10 flowering stems and 4 fruiting stems; not known if genets or ramets, or a combination thereof

Reproductive State: Flowering/fruiting

Latitude: 40.78610°N
Longitude: from -089.53500° W
(WGS84/NAD83)
Voucher: Yes (*Murphy #2322* - ILLS) **Photograph:** No

Community Description:

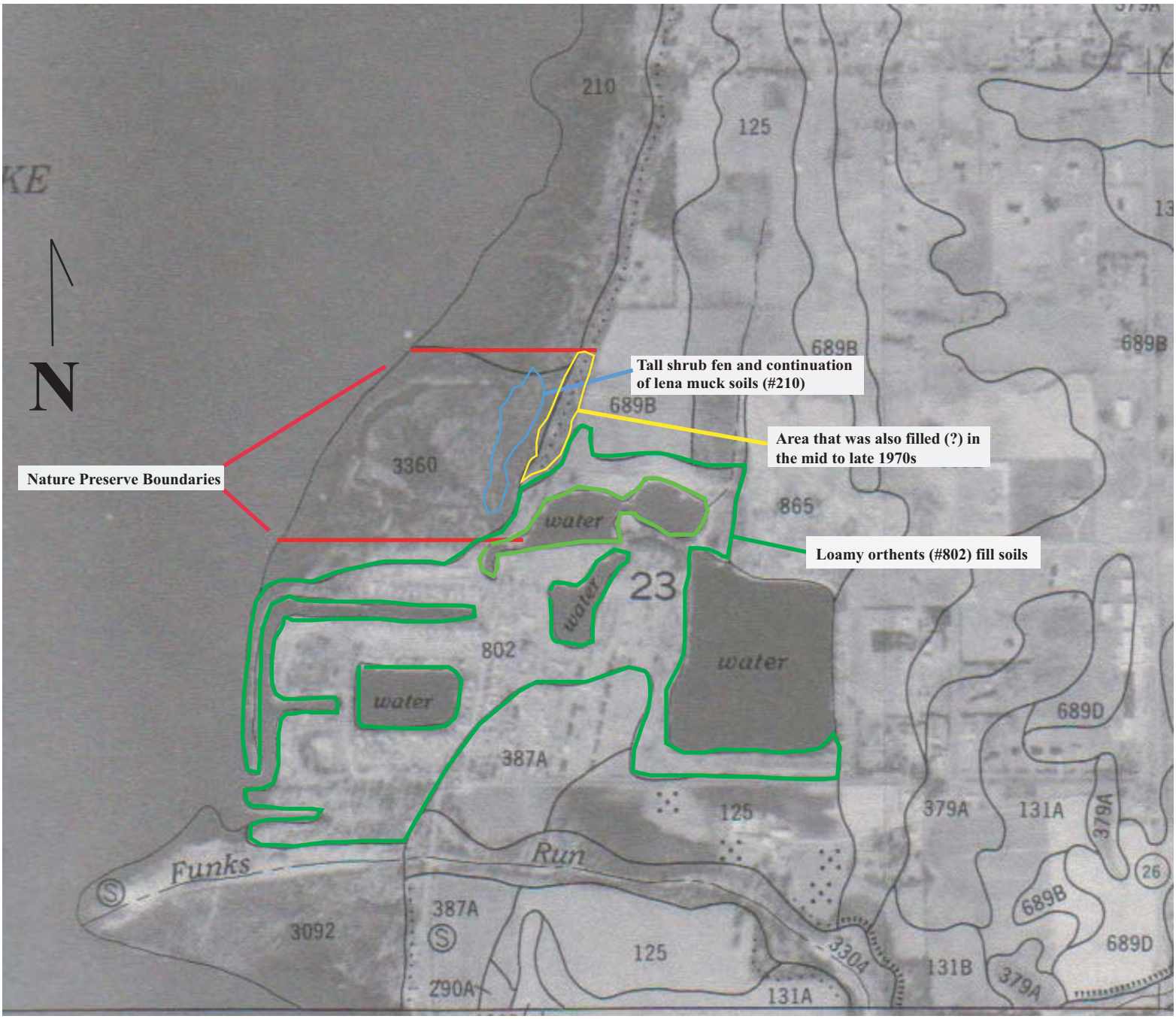
Natural Community: More open portion of the tall shrub fen

Associate Species: *Apios americana, Aster puniceus, Bolboshoenus fluviatilis, Caltha palustris, Carex hystericina, Chelone glabra, Cornus sericea, Cuscuta gronovii, Eupatoriadelphus maculatus, Galium obtusum, G. triflorum, Glyceria striata, Impatiens capensis, Iris shrevei, Lysimachia vulgaris*, Pilea fontana, Ranunculus recurvatus, Ribes americanum, Sagittaria latifolia, Silene nivea, Smilacina stellata, Solidago patula, Stachys hispida, Symplocarpus foetidus, Thelypteris palustris, Toxicodendron vernix,* and *Viburnum lentago.*

Comments: None

Appendix 17. Photograph of *Filipendula rubra* (queen of the prairie) specimen (*Murphy #2322* - ILLS), colleced in the tall shrub fen community, in Spring Bay Fen Nature Preserve, Woodford County, Illinois, on 24 July, 2007.

Appendix 18. Soil map from Teater (1999) showing soils of Spring Bay Fen Nature Preserve and surrouding areas, in Woodford County, Illinois. Soil codes are as follows: 210 = Lena muck; 689B = Coloma sand - 1 to 7% slopes; 802 = Orthents, loamy (soils of cut and fill areas); and 3360 = Slacwater silt loam (floodplain soils).



Appendix 19. Floristic quality assessment of vascular plant taxa occurring in the tall shrub fen community, within Spring Bay Fen Nature Preserve, Woodford County, Illinois. Abbreviations are as follows: **FQI** = floristic quality index; **C** = coefficient of conservatism; **W** = numeric wetness values associated with wetland categories (see end of appendix); **Wetness** = wetland classification category (see end of appendix); **Physiog.** = physiognomy (combination of structural attributes, life history and taxonomic classification). Single letter prefixes accompanying Forb, Grass, Sedge or Vine classifications are as follows: A = annual, H= herbaceous, P = perennial, W = woody. Taxa with scientific names in all capital letters are adventive to the region.

FLORISTIC QUALITY DATA	Native	92	92.0%	Adventive	8	8.0%
92 NATIVE SPECIES	Tree	5	5.0%	Tree	0	0.0%
100 Total Species	Shrub	12	12.0%	Shrub	2	2.0%
4.0 NATIVE MEAN C	W-Vine	4	4.0%	W-Vine	0	0.0%
3.7 W/Adventives	H-Vine	2	2.0%	H-Vine	0	0.0%
38.8 NATIVE FQI	P-Forb	44	44.0%	P-Forb	3	3.0%
37.2 W/Adventives	B-Forb	2	2.0%	B-Forb	0	0.0%
-2.7 NATIVE MEAN W	A-Forb	10	10.0%	A-Forb	0	0.0%
-2.5 W/Adventives	P-Grass	6	6.0%	P-Grass	2	2.0%
AVG: Fac. Wetland	A-Grass	0	0.0%	A-Grass	1	1.0%
	P-Sedge	6	6.0%	P-Sedge	0	0.0%
	A-Sedge	0	0.0%	A-Sedge	0	0.0%
	Fern	1	1.0%			

C	Scientific Name	W	Wetness	Physiog.	Common Name
1	Acer saccharinum	-3	FACW	Tree	SILVER MAPLE
6	Amorpha fruticosa	-4	FACW+	Shrub	FALSE INDIGO BUSH
3	Apios americana	-3	FACW	H-Vine	GROUND NUT
4	Asclepias incarnata	-5	OBL	P-Forb	SWAMP MILKWEED
2	Aster lateriflorus	-2	FACW-	P-Forb	SIDE-FLOWERING ASTER
4	Aster ontarionis	0	FAC	P-Forb	ONTARIO ASTER
7	Aster puniceus	-5	OBL	P-Forb	BRISTLY ASTER
1	Bidens frondosa	-3	FACW	A-Forb	COMMON BEGGAR'S TICKS
5	Blephilia hirsuta	4	FACU-	P-Forb	WOOD MINT
3	Boehmeria cylindrica	-5	OBL	P-Forb	FALSE NETTLE
0	BROMUS TECTORUM	5	UPL	A-Grass	CHEAT GRASS
7	Caltha palustris	-5	OBL	P-Forb	COWSLIP
1	Calystegia sepium	0	FAC	P-Forb	AMERICAN BINDWEED
5	Cardamine bulbosa	-5	OBL	P-Forb	BULB BITTERCRESS
5	Carex conjuncta	-3	FACW	P-Sedge	GREEN-HEADED FOX SEDGE
2	Carex granularis	-4	FACW+	P-Sedge	PALE SEDGE
6	Carex hystericina	-5	OBL	P-Sedge	PORCUPINE SEDGE
2	Carex stipata	-5	OBL	P-Sedge	COMMON FOX SEDGE
4	Cephalanthus occidentalis	-5	OBL	Shrub	BUTTONBUSH
1	Chaerophyllum procumbens	-1	FAC+	A-Forb	STREAMBANK CHERVIL
7	Chelone glabra	-5	OBL	P-Forb	WHITE TURTLEHEAD
4	Cicuta maculata	-5	OBL	B-Forb	WATER HEMLOCK
5	Cinna arundinacea	-3	FACW	P-Grass	COMMON WOOD REED
9	Cirsium muticum	-5	OBL	B-Forb	FEN THISTLE
3	Clematis virginiana	0	FAC	W-Vine	VIRGIN'S BOWER
4	Cornus obliqua	-5	OBL	Shrub	PALE DOGWOOD
4	Cornus stolonifera	-3	FACW	Shrub	RED OSIER DOGWOOD
4	Corylus americana	0	FAC	Shrub	AMERICAN FILBERT
1	Cryptotaenia canadensis	0	FAC	P-Forb	HONEWORT
2	Cuscuta gronovii	-3	FACW	A-Forb	COMMON DODDER
3	Epilobium coloratum	-5	OBL	P-Forb	CINNAMON WILLOW HERB

Appendix 19 continued

C	Scientific Name	W	Wetness	Physiog.	Common Name
3	Erigeron philadelphicus	-3	FACW	P-Forb	MARSH FLEABANE
5	Eupatorium maculatum	-5	OBL	P-Forb	SPOTTED JOE PYE WEED
4	Eupatorium perfoliatum	-4	FACW+	P-Forb	COMMON BONESET
5	Festuca obtusa	2	FACU+	P-Grass	NODDING FESCUE
10	Filipendula rubra	-4	FACW+	P-Forb	QUEEN OF THE PRAIRIE
8	Fraxinus nigra	-4	FACW+	Tree	BLACK ASH
2	Fraxinus pennsylvanica v. subintegerrima	-3	FACW	Tree	GREEN ASH
5	Galium obtusum	-4	FACW+	P-Forb	WILD MADDER
4	Galium triflorum	2	FACU+	P-Forb	SWEET-SCENTED BEDSTRAW
2	Geum canadense	0	FAC	P-Forb	WHITE AVENS
4	Glyceria striata	-5	OBL	P-Grass	FOWL MANNA GRASS
2	Humulus lupulus	3	FACU	H-Vine	COMMON HOPS
2	Impatiens capensis	-3	FACW	A-Forb	SPOTTED TOUCH-ME-NOT
4	Impatiens pallida	-3	FACW	A-Forb	PALE TOUCH-ME-NOT
5	Iris shrevei	-5	OBL	P-Forb	SOUTHERN BLUE FLAG
2	Laportea canadensis	-3	FACW	P-Forb	CANADA WOOD NETTLE
3	Leersia oryzoides	-5	OBL	P-Grass	RICE CUT GRASS
4	Leersia virginica	-3	FACW	P-Grass	WHITE GRASS
3	Lemna minor	-5	OBL	A-Forb	SMALL DUCKWEED
4	Lobelia siphilitica	-4	FACW+	P-Forb	GREAT BLUE LOBELIA
0	LONICERA X BELLA	3	FACU	Shrub	SHOWY FLY HONEYSUCKLE
4	Ludwigia palustris v. americana	-5	OBL	P-Forb	MARSH PURSLANE
5	Lycopus virginicus	-5	OBL	P-Forb	BUGLE WEED
4	Lysimachia ciliata	-3	FACW	P-Forb	FRINGED LOOSESTRIFE
0	LYSIMACHIA NUMMULARIA	-4	FACW+	P-Forb	MONEYWORT
0	LYSIMACHIA VULGARIS	-2	FACW-	P-Forb	GARDEN LOOSESTRIFE
0	MENTHA X PIPERITA	-5	OBL	P-Forb	PEPPERMINT
7	Oxypolis rigidior	-5	OBL	P-Forb	COWBANE
2	Parthenocissus quinquefolia	1	FAC-	W-Vine	VIRGINIA CREEPER
8	Peltandra virginica	-5	OBL	P-Forb	ARROW ARUM
0	PHALARIS ARUNDINACEA	-4	FACW+	P-Grass	REED CANARY GRASS
0	PHRAGMITES AUSTRALIS	-4	FACW+	P-Grass	COMMON REED
6	Pilea fontana	-3	FACW	A-Forb	BOG CLEARWEED
3	Polygonum amphibium	-5	OBL	P-Forb	WATER KNOTWEED
3	Polygonum punctatum	-5	OBL	A-Forb	SMARTWEED
3	Prunus virginiana	1	FAC-	Shrub	COMMON CHOKE CHERRY
5	Ranunculus recurvatus	-3	FACW	A-Forb	HOOKED BUTTERCUP
3	Ranunculus sceleratus	-5	OBL	A-Forb	CURSED CROWFOOT
1	Rhus glabra	5	UPL	Shrub	SMOOTH SUMAC
5	Ribes americanum	-3	FACW	Shrub	WILD BLACK CURRENT
3	Rudbeckia laciniata	-4	FACW+	P-Forb	WILD GOLDEN GLOW
7	Rumex orbiculatus	-5	OBL	P-Forb	GREAT WATER DOCK
4	Sagittaria latifolia	-5	OBL	P-Forb	COMMON ARROWHEAD
4	Salix discolor	-3	FACW	Shrub	PUSSY WILLOW
3	Salix nigra	-5	OBL	Tree	BLACK WILLOW
2	Sambucus canadensis	4	FACU-	Shrub	COMMON ELDER
4	Scirpus atrovirens	-5	OBL	P-Sedge	DARK GREEN RUSH
3	Scirpus fluviatilis	-5	OBL	P-Sedge	RIVER BULRUSH
4	Scutellaria lateriflora	-5	OBL	P-Forb	MAD-DOG SKULLCAP

Appendix 19 continued

C	Scientific Name	W	Wetness	Physiog.	Common Name
8	Silene nivea	-3	FACW	P-Forb	SNOWY CAMPION
4	Silphium perfoliatum	-2	FACW-	P-Forb	CUP PLANT
5	Sium suave	-5	OBL	P-Forb	WATER PARSNIP
5	Smilacina stellata	1	FAC-	P-Forb	STARRY FALSE SOLOMON SEAL
3	Solidago gigantea	-3	FACW	P-Forb	LATE GOLDENROD
9	Solidago patula	-5	OBL	P-Forb	ROUGH-LEAVED GOLDENROD
5	Sparganium eurycarpum	-5	OBL	P-Forb	COMMON BUR REED
5	Sphenopholis obtusata	0	FAC	P-Grass	PRAIRIE WEDGE GRASS
5	Stachys tenuifolia v. hispida	-5	OBL	P-Forb	MARSH HEDGE NETTLE
1	Symphoricarpos orbiculatus	3	FACU	Shrub	CORALBERRY
3	Teucrium canadense v. virginicum	-2	FACW-	P-Forb	AMERICAN GERMANDER
5	Thalictrum revolutum	0	FAC	P-Forb	WAXY MEADOW RUE
7	Thelypteris palustris v. pubescens	-4	FACW+	Fern	MARSH SHIELD FERN
5	Tilia americana	3	FACU	Tree	AMERICAN LINDEN
1	Toxicodendron radicans	3	FACU	W-Vine	POISON IVY
2	Urtica dioica	-1	FAC+	P-Forb	TALL NETTLE
4	Verbesina alternifolia	-3	FACW	P-Forb	WINGSTEM
4	Viburnum lentago	-1	FAC+	Shrub	NANNYBERRY
0	VIBURNUM OPULUS	0	FAC	Shrub	EUROPEAN HIGH-BUSH CRANBERRY
2	Vitis riparia	-2	FACW-	W-Vine	RIVERBANK GRAPE

The average coefficient of conservatism ($\overline{C}$) and floristic quality index [FQI = (I)] were calculated for each site according to Taft et al. (1997), using the following formulae, respectively:

$$\overline{C} = \sum C / N$$

Where C is the coefficient of conservatism and N is the number of taxa; and:

$$\text{FQI } (I) = \overline{C}\,(\sqrt{N})$$

Where I is a weighted index of species richness, and is the arithmetic product of the average coefficient of conservatism ($\overline{C}$) and the square root of species richness ($\sqrt{N}$) of a given natural area.

Wetland classification categories follow Reed (1988) for Region 3. Further details are from Taft et al. (1997). Plants are placed within one of five wetland indicator categories: Obligate Wetland (OBL), Facultative Wetland (FACW), Facultative (FAC), Facultative Upland (FACU), and Upland (UPL). Within any of these five categories, a "+" indicates that a particular taxon has a greater tendency to occur in wetlands while a "-" indicates a lesser tendency. Following this, indicator status categories, in descending order of probability of occurrence in wetland habitat to upland habitat, would be:

-5 Obligate Wetland	(OBL)
-4 Facultative Wetland +	(FACW+)
-3 Facultative Wetland	(FACW)
-2 Facultative Wetland -	(FACW-)
-1 Facultative +	(FAC+)
0 Facultative	(FAC)
+1 Facultative -	(FAC-)
+2 Facultative Upland +	(FACU+)
+3 Facultative Upland	(FACU)
+4 Facultative Upland -	(FACU-)
+5 Upland	(UPL)

Appendix 20. Frequency, mean cover, relative frequency, relative cover, and importance values (IV 200) of ground flora species occurring in tall shrub fen sampling plots at Spring Bay Fen Nature Preserve, Woodford Co., Illinois. Species are listed in descending rank order by importance value. Importance values are the sum of the relative frequency and relative cover (* = adventive species).

Species	Freq. %	Mean Cover	Rel. Freq.%	Rel. Cover %	IV 200 (%)
Apios americana	98	28.68	8.94	18.68	27.62
Symplocarpus foetidus	90	23.45	8.21	15.27	23.48
Impatiens capensis	94	15.15	8.58	9.87	18.44
Aster puniceus	62	12.07	5.66	7.86	13.52
Sagittaria latifolia	48	10.8	4.38	7.03	11.41
Ribes americanum	72	7.16	6.57	4.66	11.23
Pilea fontana	76	4.14	6.93	2.70	9.63
Solidago patula	60	5.94	5.47	3.87	9.34
**Lysimachia vulgaris*	40	8.14	3.65	5.30	8.95
Peltandra virginica	28	6.66	2.55	4.34	6.89
**Lysimachia nummularia*	48	2.97	4.38	1.93	6.31
Eupatoriadelphus maculatus	28	4.86	2.55	3.16	5.72
Parthenocissus quinquefolia	32	2.59	2.92	1.69	4.61
Smilacina stellata	30	2.29	2.74	1.49	4.23
Clematis virginiana	26	2.7	2.37	1.76	4.13
Cuscuta gronovii	40	0.25	3.65	0.16	3.81
Rudbeckia laciniata	16	2.11	1.46	1.37	2.83
Scirpus fluviatilis	10	2.16	0.91	1.41	2.32
Calystegia sepium	18	0.73	1.64	0.48	2.12
Chelone glabra	10	1.26	0.91	0.82	1.73
Geum canadense	14	0.66	1.28	0.43	1.71
Silene nivea	14	0.42	1.28	0.27	1.55
**Mentha X piperita*	10	0.97	0.91	0.63	1.54
Laportea canadensis	10	0.97	0.91	0.63	1.54
Caltha palustris	12	0.26	1.09	0.17	1.26
Carex hystericina	10	0.54	0.91	0.35	1.26
Cornus obliqua	10	0.44	0.91	0.29	1.20
Silphium perfoliatum	4	1.05	0.36	0.68	1.05
Scutellaria lateriflora	8	0.19	0.73	0.12	0.85
Boehmeria cylindrica	8	0.14	0.73	0.09	0.82
Viburnum lentago	8	0.14	0.73	0.09	0.82
Glyceria striata	6	0.42	0.55	0.27	0.82
Acer saccharinum	6	0.13	0.55	0.08	0.63
Persicaria amphibium	4	0.36	0.36	0.23	0.60
Lycopus virginicus	4	0.36	0.36	0.23	0.60
Galium triflorum	4	0.12	0.36	0.08	0.44
Epilobium coloratum	4	0.07	0.36	0.05	0.41
Thalictrum revolutum	4	0.07	0.36	0.05	0.41
Toxicodendron vernix	2	0.3	0.18	0.20	0.38
Cirsium muticum	2	0.3	0.18	0.20	0.38
Filipendula rubra	2	0.3	0.18	0.20	0.38
**Lonicera X bella*	2	0.3	0.18	0.20	0.38
Urtica gracilis	2	0.3	0.18	0.20	0.38
Sparganium eurycarpum	2	0.3	0.18	0.20	0.38
Galium obtusum	2	0.06	0.18	0.04	0.22
Lysimachia ciliata	2	0.06	0.18	0.04	0.22
Stachys hispida	2	0.06	0.18	0.04	0.22
Vitis riparia	2	0.06	0.18	0.04	0.22
Leersia oryzoides	2	0.06	0.18	0.04	0.22
Cinna arundinacea	2	0.01	0.18	0.01	0.19
Aster lateriflorus	2	0.01	0.18	0.01	0.19
Carex sp.	2	0.01	0.18	0.01	0.19
Fraxinus lanceolata	2	0.01	0.18	0.01	0.19
Totals		153.56	100.00	100.00	200.00
Bare ground/leaf litter		17.63			

Appendix 21. Summary data for shrub (50 cm tall < stems ≤ 2.5 cm DBH) species occurring in tall shrub fen sampling area (400 m² rectangular plot) at Spring Bay Fen Nature Preserve, Woodford Co., Illinois. Species are listed in descending rank order by relative density/hectare (%) (* = adventive species).

Scientific Name	# Occurrences	Stem Density/ha	Rel. Density/ha (%)
Ribes americana	144	3600	60.25
Viburnum lentago	41	1025	17.15
Cornus stolonifera	26	650	10.88
Rhus vernix	18	450	7.53
**Lonicera X bella*	7	175	2.93
Salix discolor	2	50	0.84
Sambus canadensis	1	25	0.42
Totals	239	5975	100.00

Appendix 22. Summary data for large saplings (stems > 1.0 m tall and 2.6 - 9.9 cm DBH) occurring in tall shrub fen sampling area (2000 m² rectangular plot) at Spring Bay Fen Nature Preserve, Woodford Co., Illinois.

Scientific Name	# Occurrences	Stem Density/ha	Rel. Density/ha (%)
Acer saccharinum	2	10	66.70
Fraxinus lanceolata	1	5	33.30
Totals	3	15	100.00

Appendix 23. Summary data for tree (stems ≥ 10 cm DBH) species occurring in tall shrub fen sampling area (2000 m² rectangular plot) at Spring Bay Fen Nature Preserve, Woodford Co., Illinois. Importance Value 200 (%) = Relative Basal Area (%) + Relative Density (%).

Scientific Name	Basal Area (BA) m²			Stem Density		
Scientific Name	Within plot (m²)	Rel. Basal Area (%)	Basal Area m²/ha	Rel. Density (%)	Density/ha	IV 200 (%)
Fraxinus lanceolata	0.6994	94.3	3.50	80.0	60	174.3
Fraxinus nigra	0.0426	5.7	0.21	20.0	15	25.7
Totals	0.6994	94.3	3.50	80.0	60	174.3

Appendix 24. Floristic quality assessment of vascular plant taxa occurring in the floodplain forest community, within Spring Bay Fen Nature Preserve, Woodford County, Illinois. Abbreviations are as follows: **FQI** = floristic quality index; **C** = coefficient of conservatism; **W** = numeric wetness values associated with wetland categories (see end of appendix); **Wetness** = wetland classification category (see end of appendix); **Physiog.** = physiognomy (combination of structural attributes, life history and taxonomic classification). Single letter prefixes accompanying Forb, Grass, Sedge or Vine classifications are as follows: A = annual, H= herbaceous, P = perennial, W = woody. Taxa with scientific names in all capital letters are adventive to the region.

FLORISTIC QUALITY DATA	Native	119	90.8%	Adventive	12	9.2%
119 NATIVE SPECIES	Tree	19	14.5%	Tree	3	2.3%
131 Total Species	Shrub	6	4.6%	Shrub	0	0.0%
3.3 NATIVE MEAN C	W-Vine	4	3.1%	W-Vine	0	0.0%
3.0 W/Adventives	H-Vine	4	3.1%	H-Vine	0	0.0%
35.8 NATIVE FQI	P-Forb	49	37.4%	P-Forb	4	3.1%
34.1 W/Adventives	B-Forb	1	0.8%	B-Forb	1	0.8%
-1.2 NATIVE MEAN W	A-Forb	16	12.2%	A-Forb	1	0.8%
-1.0 W/Adventives	P-Grass	8	6.1%	P-Grass	1	0.8%
AVG: Faculative (+)	A-Grass	0	0.0%	A-Grass	2	1.5%
	P-Sedge	11	8.4%	P-Sedge	0	0.0%
	A-Sedge	0	0.0%	A-Sedge	0	0.0%
	Fern	1	0.8%			

C	Scientific Name	W	Wetness	Physiog.	Common Name
0	Acalypha rhomboidea	3	FACU	A-Forb	THREE-SEEDED MERCURY
1	Acer negundo	-2	FACW-	Tree	BOXELDER
6	Acer nigrum	5	UPL	Tree	BLACK MAPLE
1	Acer saccharinum	-3	FACW	Tree	SILVER MAPLE
4	Agastache nepetoides	3	FACU	P-Forb	YELLOW GIANT HYSSOP
4	Agrostis perennans	1	FAC-	P-Grass	AUTUMN BENT GRASS
0	ALLIARIA PETIOLATA	0	FAC	B-Forb	GARLIC MUSTARD
6	Amorpha fruticosa	-4	FACW+	Shrub	FALSE INDIGO BUSH
4	Amphicarpa bracteata	0	FAC	H-Vine	HOG PEANUT
4	Anemone canadensis	-3	FACW	P-Forb	MEADOW ANEMONE
2	Apocynum cannabinum	0	FAC	P-Forb	DOGBANE
4	Arisaema dracontium	-3	FACW	P-Forb	GREEN DRAGON
4	Arisaema triphyllum	-2	FACW-	P-Forb	INDIAN TURNIP
2	Aster lateriflorus	-2	FACW-	P-Forb	SIDE-FLOWERING ASTER
4	Aster ontarionis	0	FAC	P-Forb	ONTARIO ASTER
2	Bidens cernua	-5	OBL	A-Forb	NODDING BUR MARIGOLD
2	Bidens connata	-5	OBL	A-Forb	PURPLESTEMMED TICKSEED
1	Bidens frondosa	-3	FACW	A-Forb	COMMON BEGGAR'S TICKS
0	Bidens vulgata	-3	FACW	A-Forb	TALL BEGGAR'S TICKS
5	Blephilia hirsuta	4	FACU-	P-Forb	WOOD MINT
3	Boehmeria cylindrica	-5	OBL	P-Forb	FALSE NETTLE
1	Calystegia sepium	0	FAC	P-Forb	AMERICAN BINDWEED
3	Cardamine pensylvanica	-4	FACW+	B-Forb	BITTER CRESS
2	Carex blanda	0	FAC	P-Sedge	COMMON WOOD SEDGE
5	Carex conjuncta	-3	FACW	P-Sedge	GREEN-HEADED FOX SEDGE
6	Carex emoryi	-5	OBL	P-Sedge	RIVERBANK SEDGE
2	Carex granularis	-4	FACW+	P-Sedge	PALE SEDGE
6	Carex grayi	-4	FACW+	P-Sedge	COMMON BUR SEDGE
3	Carex grisea	5	UPL	P-Sedge	WOOD GRAY SEDGE

Appendix 24 continued

C	Scientific Name	W	Wetness	Physiog.	Common Name
4	Carex jamesii	5	UPL	P-Sedge	GRASS SEDGE
5	Carex lupulina	-5	OBL	P-Sedge	COMMON HOP SEDGE
6	Carex muskingumensis	-5	OBL	P-Sedge	SWAMP OVAL SEDGE
4	Carex normalis	-3	FACW	P-Sedge	SPREADING OVAL SEDGE
5	Carex rosea	5	UPL	P-Sedge	CURLY-STYLED WOOD SEDGE
0	CATALPA cf. SPECIOSA (sterile)	3	FACU	Tree	CIGAR TREE
4	Cephalanthus occidentalis	-5	OBL	Shrub	BUTTONBUSH
3	Cercis canadensis	3	FACU	Tree	EASTERN REDBUD
1	Chaerophyllum procumbens	-1	FAC+	A-Forb	STREAMBANK CHERVIL
5	Cinna arundinacea	-3	FACW	P-Grass	COMMON WOOD REED
2	Circaea lutetiana v. canadensis	3	FACU	P-Forb	ENCHANTER'S NIGHTSHADE
0	Conyza canadensis	1	FAC-	A-Forb	HORSEWEED
2	Cornus drummondii	0	FAC	Shrub	ROUGH-LEAVED DOGWOOD
1	Cryptotaenia canadensis	0	FAC	P-Forb	HONEWORT
0	DIGITARIA ISCHAEMUM	3	FACU	A-Grass	SMOOTH CRAB GRASS
0	DIGITARIA SANGUINALIS	3	FACU	A-Grass	HAIRY CRAB GRASS
4	Dioscorea villosa	1	FAC-	H-Vine	WILD YAM
1	Ellisia nyctelea	-1	FAC+	A-Forb	AUNT LUCY
4	Elymus virginicus	-2	FACW-	P-Grass	VIRGINIA WILD RYE
3	Epilobium coloratum	-5	OBL	P-Forb	CINNAMON WILLOW HERB
0	Equisetum arvense	0	FAC	Fern	COMMON HORSETAIL
2	Erechtites hieracifolia	3	FACU	A-Forb	FIREWEED
3	Erigeron philadelphicus	-3	FACW	P-Forb	MARSH FLEABANE
4	Eupatorium perfoliatum	-4	FACW+	P-Forb	COMMON BONESET
1	Eupatorium serotinum	-1	FAC+	P-Forb	LATE BONESET
5	Festuca obtusa	2	FACU+	P-Grass	NODDING FESCUE
4	Fraxinus americana	3	FACU	Tree	WHITE ASH
8	Fraxinus nigra	-4	FACW+	Tree	BLACK ASH
2	Fraxinus pennsylvanica v. subintegerrima	-3	FACW	Tree	GREEN ASH
6	Fraxinus quadrangulata	5	UPL	Tree	BLUE ASH
4	Galium triflorum	2	FACU+	P-Forb	SWEET-SCENTED BEDSTRAW
2	Geum canadense	0	FAC	P-Forb	WHITE AVENS
0	GLECHOMA HEDERACEA	3	FACU	P-Forb	GROUND IVY
2	Gleditsia triacanthos	0	FAC	Tree	HONEY LOCUST
4	Glyceria striata	-5	OBL	P-Grass	FOWL MANNA GRASS
1	Hackelia virginiana	1	FAC-	P-Forb	STICKSEED
5	Hydrophyllum virginianum	-2	FACW-	P-Forb	VIRGINIA WATERLEAF
3	Hypericum punctatum	-1	FAC+	P-Forb	SPOTTED ST. JOHN'S WORT
2	Impatiens capensis	-3	FACW	A-Forb	SPOTTED TOUCH-ME-NOT
6	Iodanthus pinnatifidus	-3	FACW	P-Forb	VIOLET CRESS
1	Ipomoea lacunosa	-3	FACW	A-Forb	SMALL MORNING GLORY
2	Ipomoea pandurata	3	FACU	P-Forb	WILD SWEET POTATO
0	IRIS PSEUDACORUS	-5	OBL	P-Forb	TALL YELLOW IRIS
5	Iris shrevei	-5	OBL	P-Forb	SOUTHERN BLUE FLAG
4	Juglans nigra	3	FACU	Tree	BLACK WALNUT
2	Laportea canadensis	-3	FACW	P-Forb	CANADA WOOD NETTLE

Appendix 24 continued

C	Scientific Name	W	Wetness	Physiog.	Common Name
4	Leersia virginica	-3	FACW	P-Grass	WHITE GRASS
6	Lobelia cardinalis	-5	OBL	P-Forb	CARDINAL FLOWER
5	Lycopus virginicus	-5	OBL	P-Forb	BUGLE WEED
4	Lysimachia ciliata	-3	FACW	P-Forb	FRINGED LOOSESTRIFE
0	LYSIMACHIA NUMMULARIA	-4	FACW+	P-Forb	MONEYWORT
0	MACLURA POMIFERA	3	FACU	Tree	HEDGE APPLE
0	MORUS ALBA	0	FAC	Tree	WHITE MULBERRY
4	Morus rubra	1	FAC-	Tree	RED MULBERRY
3	Muhlenbergia frondosa	-3	FACW	P-Grass	COMMON SATIN GRASS
3	Osmorhiza claytonii	4	FACU-	P-Forb	HAIRY SWEET CICELY
3	Osmorhiza longistylis	4	FACU-	P-Forb	ANISE ROOT
0	Oxalis stricta	3	FACU	P-Forb	TALL WOOD SORREL
2	Parietaria pensylvanica	3	FACU	A-Forb	PENNSYLVANIA PELLITORY
2	Parthenocissus quinquefolia	1	FAC-	W-Vine	VIRGINIA CREEPER
8	Peltandra virginica	-5	OBL	P-Forb	ARROW ARUM
0	PHALARIS ARUNDINACEA	-4	FACW+	P-Grass	REED CANARY GRASS
5	Phlox divaricata	3	FACU	P-Forb	BLUE PHLOX
1	Phyla lanceolata	-5	OBL	P-Forb	FOG FRUIT
6	Physostegia virginiana	-3	FACW	P-Forb	OBEDIENT PLANT
1	Phytolacca americana	1	FAC-	P-Forb	POKEWEED
3	Pilea pumila	-3	FACW	A-Forb	CANADA CLEARWEED
3	Platanus occidentalis	-3	FACW	Tree	BUTTONWOOD
5	Poa sylvestris	0	FAC	P-Grass	WOODLAND BLUE GRASS
0	POLYGONUM CESPITOSUM v. LONGISETUM	5	UPL	A-Forb	CREEPING SMARTWEED
1	Polygonum pensylvanicum	-4	FACW+	A-Forb	PINKWEED
3	Polygonum punctatum	-5	OBL	A-Forb	SMARTWEED
2	Polygonum scandens	0	FAC	H-Vine	CLIMBING FALSE BUCKWHEAT
3	Polygonum virginianum	0	FAC	P-Forb	VIRGINIA KNOTWEED
2	Populus deltoides	-1	FAC+	Tree	EASTERN COTTONWOOD
1	Prunus serotina	3	FACU	Tree	WILD BLACK CHERRY
5	Quercus macrocarpa	1	FAC-	Tree	BURR OAK
1	Ranunculus abortivus	-2	FACW-	A-Forb	LITTLE-LEAF BUTTERCUP
5	Rosa setigera	2	FACU+	Shrub	ILLINOIS ROSE
2	Rubus occidentalis	3	FACU	Shrub	BLACK RASPBERRY
5	Rumex verticillatus	-5	OBL	P-Forb	SWAMP DOCK
4	Salix amygdaloides	-3	FACW	Tree	PEACH-LEAVED WILLOW
3	Salix nigra	-5	OBL	Tree	BLACK WILLOW
2	Sambucus canadensis	4	FACU-	Shrub	COMMON ELDER
5	Saururus cernuus	-5	OBL	P-Forb	LIZARD'S TAIL
4	Scutellaria lateriflora	-5	OBL	P-Forb	MAD-DOG SKULLCAP
3	Sicyos angulatus	-2	FACW-	H-Vine	BUR CUCUMBER
8	Silene nivea	-3	FACW	P-Forb	SNOWY CAMPION
5	Sisyrinchium angustifolium	-2	FACW-	P-Forb	STOUT BLUE-EYED GRASS
3	Solidago gigantea	-3	FACW	P-Forb	LATE GOLDENROD
5	Stachys tenuifolia v. hispida	-5	OBL	P-Forb	MARSH HEDGE NETTLE
0	TARAXACUM OFFININALE	3	FACU	P-Forb	COMMON DANDELION

Appendix 24 continued

C	Scientific Name	W	Wetness	Physiog.	Common Name
3	Teucrium canadense v. virginicum	-2	FACW-	P-Forb	AMERICAN GERMANDER
1	Toxicodendron radicans	3	FACU	W-Vine	POISON IVY
5	Ulmus americana	-2	FACW-	Tree	AMERICAN ELM
3	Ulmus rubra	0	FAC	Tree	SLIPPERY ELM
2	Urtica dioica	-1	FAC+	P-Forb	TALL NETTLE
3	Verbena urticifolia	-1	FAC+	P-Forb	WHITE VERVIAN
4	Verbesina alternifolia	-3	FACW	P-Forb	WINGSTEM
4	Viola missouriensis	-3	FACW	P-Forb	MISSOURI VIOLET
2	Vitis riparia	-2	FACW-	W-Vine	RIVERBANK GRAPE
4	Vitis vulpina	-2	FACW-	W-Vine	FROST GRAPE

The average coefficient of conservatism ($\overline{C}$) and floristic quality index [FQI = (I)] were calculated for each site according to Taft et al. (1997), using the following formulae, respectively:

$$\overline{C} = \sum C / N$$

Where C is the coefficient of conservatism and N is the number of taxa; and:

$$\text{FQI } (I) = \overline{C}\,(\sqrt{N})$$

Where I is a weighted index of species richness, and is the arithmetic product of the average coefficient of conservatism ($\overline{C}$) and the square root of species richness ($\sqrt{N}$) of a given natural area.

Wetland classification categories follow Reed (1988) for Region 3. Further details are from Taft et al. (1997). Plants are placed within one of five wetland indicator categories: Obligate Wetland (OBL), Facultative Wetland (FACW), Facultative (FAC), Facultative Upland (FACU), and Upland (UPL). Within any of these five categories, a "+" indicates that a particular taxon has a greater tendency to occur in wetlands while a "-" indicates a lesser tendency. Following this, indicator status categories, in descending order of probability of occurrence in wetland habitat to upland habitat, would be:

-5 Obligate Wetland	(OBL)
-4 Facultative Wetland +	(FACW+)
-3 Facultative Wetland	(FACW)
-2 Facultative Wetland -	(FACW-)
-1 Facultative +	(FAC+)
0 Facultative	(FAC)
+1 Facultative -	(FAC-)
+2 Facultative Upland +	(FACU+)
+3 Facultative Upland	(FACU)
+4 Facultative Upland -	(FACU-)
+5 Upland	(UPL)

Appendix 25. Frequency, mean cover, relative frequency, relative cover, and importance values (IV 200) of ground flora species occurring in floodplain forest plots at Spring Bay Fen Nature Preserve, Woodford Co., Illinois. Species are listed in descending rank order by importance value. Importance values (IV 200 %) are the sum of the relative frequency (%) and relative cover (%) (* = adventive species).

Species	Freq. %	Mean Cover	Rel. Freq.%	Rel. Cover %	IV 200 (%)
Laportea canadensis	98.0	33.26	10.72	36.02	46.74
Pilea pumila	94.0	22.35	10.28	24.21	34.49
**Lysimachia nummularia*	56.0	14.42	6.13	15.62	21.74
Aster ontarionis	44.0	3.34	4.81	3.62	8.43
Leersia virginica	62.0	1.3	6.78	1.41	8.19
Persicaria punctata	50.0	1.76	5.47	1.91	7.38
Acalypha rhomboidea	48.0	1.72	5.25	1.86	7.11
Boehmeria cylindrica	26.0	3.36	2.84	3.64	6.48
Viola missouriensis	38.0	1.22	4.16	1.32	5.48
Impatiens capensis	28.0	1.96	3.06	2.12	5.19
Stachys hispida	26.0	1.59	2.84	1.72	4.57
Toxicodendron radicans	20.0	1.12	2.19	1.21	3.40
Carex blanda	24.0	0.27	2.63	0.29	2.92
Hackelia virginiana	20.0	0.54	2.19	0.58	2.77
Ulmus americana	22.0	0.21	2.41	0.23	2.63
Eupatorium serotinum	18.0	0.14	1.97	0.15	2.12
Elymus virginicus	16.0	0.18	1.75	0.19	1.95
Cinna arundinacea	12.0	0.55	1.31	0.60	1.91
Acer saccharinum	16.0	0.08	1.75	0.09	1.84
Fallopia scandens	14.0	0.22	1.53	0.24	1.77
Parthenocissus quinquefolia	14.0	0.17	1.53	0.18	1.72
Vitis riparia	14.0	0.12	1.53	0.13	1.66
**Alliaria petiolata*	10.0	0.152	1.09	0.16	1.26
Scutellaria lateriflora	10.0	0.05	1.09	0.05	1.15
Cornus drummondii	6.0	0.37	0.66	0.40	1.06
Iodanthus pinnatifidus	8.0	0.14	0.88	0.15	1.03
Bidens frondosa	6.0	0.32	0.66	0.35	1.00
Geum canadense	8.0	0.09	0.88	0.10	0.97
Eupatorium perfoliatum	8.0	0.09	0.88	0.10	0.97
Hypericum cf. *punctatum*	8.0	0.04	0.88	0.04	0.92
Parietaria pensylvanica	6.0	0.18	0.66	0.19	0.85
Physostegia virginiana	6.0	0.13	0.66	0.14	0.80
**Morus alba*	6.0	0.08	0.66	0.09	0.74
Lycopus virginicus	6.0	0.08	0.66	0.09	0.74
Carex muskingumensis	6.0	0.03	0.66	0.03	0.69
Agrostis perennans	4.0	0.07	0.44	0.08	0.51
Carex conjuncta	4.0	0.07	0.44	0.08	0.51
Ranunculus abortivus	4.0	0.07	0.44	0.08	0.51
Oxalis fontana	4.0	0.02	0.44	0.02	0.46
Glyceria striata	4.0	0.02	0.44	0.02	0.46
Silene nivea	4.0	0.02	0.44	0.02	0.46
Sisyrinchium angustifolium	4.0	0.02	0.44	0.02	0.46
Fraxinus lanceolata	2.0	0.06	0.22	0.06	0.28
Celtis occidentalis	2.0	0.06	0.22	0.06	0.28
Carex granularis	2.0	0.06	0.22	0.06	0.28
Sambucus canadensis	2.0	0.06	0.22	0.06	0.28
**Phalaris arundinacea*	2.0	0.06	0.22	0.06	0.28
Carex emoryi	2.0	0.01	0.22	0.01	0.23
Prunus serotina	2.0	0.01	0.22	0.01	0.23
Erechtites hieracifolia	2.0	0.01	0.22	0.01	0.23
Rubus occidentalis	2.0	0.01	0.22	0.01	0.23
Bidens connata	2.0	0.01	0.22	0.01	0.23
Bidens cernua	2.0	0.01	0.22	0.01	0.23
**Taraxacum officinale*	2.0	0.01	0.22	0.01	0.23
Cryptotaenia canadensis	2.0	0.01	0.22	0.01	0.23
Peltandra virginica	2.0	0.01	0.22	0.01	0.23
Quercus macrocarpa	2.0	0.01	0.22	0.01	0.23
Carex sp. (sterile)	2.0	0.01	0.22	0.01	0.23
Totals		92.332	100.00	100.00	200.00
Bare ground/leaf litter		33.31			

Appendix 26. Summary data for small saplings, including shrubs (50 cm tall < stems ≤ 2.5 cm DBH) occurring in floodplain forest sampling area (2000 m² rectangular plot) at Spring Bay Fen Nature Preserve, Woodford Co., Illinois.

Scientific Name	# Occurrences	Stem Density/ha	Rel. Density/ha (%)
Fraxinus lanceolata	5	25	83.3
Amorpha fruticosa	1	5	16.7
Totals	6	30	100.0

Appendix 27. Summary data for large saplings, including shrubs (2.5 cm < DBH < 10.0 cm) occurring in floodplain forest sampling area (2000 m² rectangular plot) at Spring Bay Fen Nature Preserve, Woodford Co., Illinois.

Scientific Name	# Occurrences	Stem Density/ha	Rel. Density/ha (%)
Fraxinus lanceolata	31	155	56.4
Acer saccharinum	19	95	34.5
Ulmus americana	4	20	7.3
Cornus drummondii	1	5	1.8
Totals	55	275	100.0

Appendix 28. Summary data for tree (stems ≥ 10 cm DBH) species occurring in floodplain forest sampling area (2000 m² rectangular plot) at Spring Bay Fen Nature Preserve, Woodford Co., Illinois. Importance Value 200 (%) = Relative Basal Area (%) + Relative Density (%).

	Basal Area (BA) m²			Stem Density		
Scientific Name	Within plot (m²)	Rel. Basal Area (%)	Basal Area m²/ha	el. Density (%	Density/ha	IV 200 (%)
Acer saccharinum	3.5846	71.7	17.92	48.9	220	120.6
Fraxinus lanceolata	0.8470	16.9	4.23	37.8	170	54.7
Salix nigra	0.3485	7.0	1.74	5.6	25	12.5
Ulmus americana	0.1040	2.1	0.52	4.4	20	6.5
Acer negundo	0.0305	0.6	0.15	2.2	10	2.8
Platanus occidentalis	0.0850	1.7	0.43	1.1	5	2.8
Totals	4.9997	100.0	25.00	100.0	450	200.0