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Vegetation of Wilmington Shrub Prairie Nature Preserve, Will County, Illinois

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ABSTRACT

Wilmington Shrub Prairie Nature Preserve is located in the southwestern corner of Will County about 4 km east of Braidwood in the Kankakee Sand Area Section of the Grand Prairie Natural Division. Extensive areas of the preserve have been degraded by past grazing, peat fires, and parts were probably cultivated before the land was purchased by the Illinois Department of Natural Resources in 1989. Small sections of the preserve still contain native vegetation of high natural quality. On both dry-mesic "black soil" prairies studied *Helianthus mollis* (downy sunflower), *Parthenium integrifolium* (America feverfew), and *Schizachyrium scoparium* (little bluestem) dominated (highest importance values). Overall, less than 25 species on each prairie had an I.V. greater than 2.5 with 61species recorded in the plots of one prairie and 102 on the second. *Spiraea tomentosa* (hardhack), *Rubus hispidus* (swampy dewberry), and *Onoclea sensibilis* (sensitive fern) dominated the two shrub prairies surveyed with mosses the common ground cover. The sedge meadow was dominated by *Carex haydenii/stricta*, *Onoclea sensibilis*, *Calamagrostis canadensis* (bluejoint grass), and *Thelypteris palustris* (marsh fern). *Cephalanthus occidentali*s (buttonbush) dominated the shrub swamp. Of the 358 vascular plant taxa found, 32 were exotics.

Key Words: dry to dry-mesic prairie, Illinois, Kankakee sand deposits, sedge meadow, shrub prairie, shrub swamp.

INTRODUCTION

Sand deposits are relatively common in the northern half of Illinois, accounting for nearly 5% of the land surface. These deposits, the result of erosion events associated with Wisconsin glaciation, were formed about 14,500 years ago (King 1981; Schwegman 1973; Willman and Frye 1970). The Kankakee sand deposits in northeastern Illinois are the most extensive in the state, extending from Newton County, Indiana west through large parts of Iroquois, Kankakee, Will, and Grundy counties, Illinois. These deposits remained after glacial lakes were drained as glacial moraines and ice dams were breached resulting in the Kankakee Torrent (Willman 1973). This torrent carried large amounts of sand and gravel down the Kankakee and Illinois River valleys into central Illinois south of present day Hennepin, Illinois (Schwegman 1973).

The early studies of Illinois sand deposits by Hart and Gleason (1907), Gleason (1910), and Vestal (1913) mostly discuss the species associated with dry to mesic sand prairies and sand savannas. Also, more recent studies in Illinois sand deposits have mostly been concerned with dry sand prairie and sand savanna communities as these habitats are

abundant, being less suitable for cultivation. Overall, dry habitats are characteristic of sand deposits, and the commonly associated species are those adapted to xeric conditions (White and Madany 1978). Plant communities of sand deposits, however, are extremely diverse and also include many differed wet and wet-mesic community types. In Will County, these wetland communities are found on the extensive outwash plains and old lake beds of Wisconsian glaciation. In these wet to mesic communities the soil has a high organic content resulting in a dark A horizon, while some of the dominant grass species (Poaceae) are replaced by sedges and rushes (Cyperaceae and Juncaceae).

Wet and mesic sand prairie communities are common in some of the nature preserves in Will County Illinois where sand areas are interspersed with “black soil” communities in some preserves and sand dunes, which are usually associated with sand deposits, are uncommon or absent. One of these preserves, Wilmington Shrub Prairie Nature Preserve (WSPNP) contains wetland communities on both fine sand and sandy loam soils. The present study was undertaken to determine vascular plant species composition, vegetation structure, and floristic quality of the major natural plant communities on this Preserve.

DESCRIPTION OF THE STUDY AREA

The 72 ha WSPNP is located in the southwestern corner of Will County about 4 km east of Braidwood, and 20 km south of Joliet (SW1/4 S2 NW1/4 S11 T32N R10E; 41.27934°N, -88.166576°W). Presently owned by the Illinois Department of Natural Resources (IDNR), the Preserve is located in the Kankakee Sand Area Section of the Grand Prairie Natural Division (Schwegman 1973). Dedicated in 1989, this Preserve contains remnants of dry-mesic to mesic “black soil” prairie, dry-mesic to mesic sand prairie, sedge meadows, marshes, sand savannas, shrub prairies, and shrub swamps (McFall and Karnes 1995). Extensive areas of the preserve have been degraded by past grazing and farming, and it is likely that extensive peat fires occurred in bog and sedge meadow communities in the mid 1900s. Small parts of the preserve still contain plant communities of high natural quality.

The Preserve is situated near the edge of former glacial Lake Wauponsee that drained during the Kankakee Torrent leaving sandy beaches and near shore sand deposits (Willman and Frye 1970). Characteristic sand savanna and sand prairie vegetation became established during the Hypsithermal period about 8,000 years ago (King 1981). The soils of the Preserve are mostly fine sandy loam (Gilford and Grundy) that are poorly drained and relatively high in organic material. Some Watseka and Ade loamy fine sand are also present on slightly higher ground. These fine sands developed from windblown sediments, are well drained, and relatively low in organic material (Hanson 2004). The climate is continental with warm summers and cold winters. Mean annual precipitation is 98.0 cm, with May having the highest rainfall (11.5 cm). Mean annual temperature is 9.9°C with the hottest month being July (average of 23.6°C), and the coldest being January (average of -5.7°C). Frost-free days range from 141 to 206, with the average being 174 days per year (Midwestern Regional Climate Center 2009; Kankakee, Illinois).

METHODS

Floristic Composition

The Preserve was visited six to ten times each year throughout the growing seasons of 2007 to 2009. During these visits voucher specimens were collected and deposited in the herbarium of the Illinois Natural History Survey, Champaign, Illinois (ILLS). The designation of exotic species follows Gleason and Cronquist (1991), Mohlenbrock (2002), and Taft et al. (1997). Nomenclature follows Mohlenbrock (2002).

Sampling

In mid-summer of 2009 transects were located randomly along cardinal compass directions within two mesic prairies, two shrub prairies, and a sedge meadow. Within each of these communities, two transects were located (n = 50 plots). Along each transect, $1m^2$ quadrats were located alternately along each transect. A random numbers table was used to determine the distance (0 to 9 m) a quadrat was located from the transect line. Species cover was determined using the Daubenmire (1959) cover class system as modified by Bailey and Poulton (1968). The modified Daubenmire cover scale is as follows: class 1 = 0 to 1%; class 2 = >1 to 5%; class 3 = >5 to 25%; class 4 = >25 to 50%; class 5 = >50 to 75%; class 6 = >75 to 95%; class 7 = >95 to 100%. Only ground layer species rooted within the quadrat frame were recorded. Mean cover was determined for each taxon using the mid-point values for each cover class, while Importance Value (I.V.) was calculated by summing relative cover and relative frequency.

The shrub swamp was sampled in late-summer of 2010 by randomly locating three transects 20 m long in various aged parts of the swamp based on the average size of the larger stems observed (swamp margin, mature swamp, old-age swamp). Along each transect five circular plots 0.001 ha (10 m^2) were located at 5 m intervals, and the number of plants of *Cephalanthus occidentalis* (buttonbush), and the number of individuals stems by basal diameter class was determined. From this data the density (plants/ha) of plants and the number of stems (stems/ha) by basal diameter classes determined.

RESULTS

Floristic Composition

The preserve supported a total of 358 vascular plant taxa in 81 families (Appendix I). Ferns, fern-allies, and gymnosperms were represented by 11 taxa in 7 families. Of the remaining taxa, 104 were monocots in 12 families, and 243 were dicots in 62 families. Non-native (exotic) species accounted for 32 taxa, about 8% of the species collected. Predominant plant families were Asteraceae (65 species), Poaceae (44), and Cyperaceae (29). The only state endangered species found was *Platanthera clavellata* (wood orchid). No state threatened species were encountered (Illinois Endangered Species Protection Board 2005).

Dry to Dry-Mesic Prairie

Two small dry to dry mesic “black soil” prairies were surveyed, one at the northwest corner of the Preserve (North Edge Prairie) (41.27989°N, -88.16562°W), the other in the south part of the Preserve (South Central Prairie) (41.27446°N, -88.16428°W). Both are situated on fine sandy loam soils high in organic material. On both prairies the dominant

grass was *Schizachyrium scoparium* (little bluestem) with *Sorghastrum nutans* (Indian grass) ranging from fifth to eight in I.V. while *Andropogon gerardii* (big bluestem) was present but not common (Table 1). *Schizachyrium scoparium* was distributed throughout the prairie as indicated by its high frequency, the other two species being less common. On both prairies *Helianthus mollis* (downy sunflower) and *Parthenium integrifolium* (America feverfew) were among the top three species in I.V. Other common forbs encountered were *Euthamia gymnospermoides* (viscid grass-leaved goldenrod), *Coreopsis tripteris* (tall tickseed), *Solidago missouriensis* (Missouri goldenrod), *Potentilla simplex* (common cinquefoil), and *Rubus flagellaris* (common dewberry). Overall, less than 25 species on each prairie had an I.V. greater than 2.5 (possible 200), though 61 species were recorded for South Central Prairie and 102 were recorded for North Edge Prairie (Table 1). Only six exotic species were recorded in the plots, *Poa pratensis* (Kentucky blue grass), *Achillea millefolium* (yarrow), and *Rumex acetosella* (sour dock) being the most common with Importance Values between 2.5 and 8.2 (Table 1).

Shrub Prairie

Two small shrub prairies were surveyed, one at the southeast corner of the Preserve (East Shrub Prairie) (41.27183°N, -88.15765ºW), the other about 250 m to the northwest in the southwest corner of the Preserve (West Shrub Prairie) (41.27307°N, -88.16689°W). At the time of the survey the East Shrub prairie had recently been brush-hogged. The vegetation survey was conducted in an undisturbed narrow section along the southern edge of this shrub prairie. Both shrub prairies were on wet to mesic, acidic sandy soils high in organic material and both were dominated by prairie shrubs, forbs, and a few grasses with mosses usually forming part of the ground-layer (White and Madany 1978). Common woody species encountered were *Spiraea tomentosa* (hardhack), *Rubus hispidus* (swampy dewberry), and *Aronia melanocarpa* (black chokeberry). The ferns *Onoclea sensibilis* (sensitive fern) and *Osmunda regalis* (royal fern) were the dominant herbaceous species encountered (Table 2). A few prairie forbs were common, many species scattered through the shrub prairie, but mostly in low numbers. Few prairie grasses were encountered, although *Andropogon gerardii* was found on the southeastern shrub prairie (I.V. of 8.6). Other grass-like plants included eight species sedges (Cyperaceae) and two rushes (Juncaceae). Overall, 49 species were encountered in West Shrub Prairie and 51 species from East Shrub Prairie. Three exotic species were found, all in very low numbers with *Poa pratensis* being the most common (I.V. of 1.8).

Mosses were relatively common in the ground layer in the shrub prairies. On East Shrub Prairie the I.V. for bryophytes was 22.0 (possible 200), on West Shrub Prairie the I.V. was only 2.9. Parts of the West Shrub Prairie had a higher concentrations of bryophytes, but in the area we surveyed mosses were not important. Species encountered included: *Aulacomnium palustre* (Hedw.) Schwaegr., *Helodium paludosum* (Sull.) Aust., *Leucobryum glaucum* (Hedw.) Ångstr., *Polytrichum formosum* Hedw., and *Sphagnum* sp.

Sedge Meadow

This community is common in the WSPNP, one being more than 3 ha in size and located in the west-central part of the Preserve (41.27496°N, -88.16402°W). This sedge meadow was dominated by *Carex haydenii* (Hayden's sedge), and probably *C. stricta* (tussock sedge), with a combined I.V. of 29.3 and a mean cover of 27.12%. The few flowering stems found were all identified to *C. haydenii* though both species were probably present.

These two sedges are difficult to separate using vegetative material, and both formed hummocks on which many of the other species grow. *Onoclea sensibilis* was second in importance with an I.V. of 24.6 followed by *Thelypteris palustris* and *Calamagrostis canadensis*. Of the 36 species encountered in the plots, one was an exotic.

Shrub Swamp

A 3 ha shrub swamp was located at the northwest corner of the Preserve (41.21844°N, -88.16479°W). This swamp was dominated almost exclusively by *Cephalanthus occidentalis* (buttonbush) shrubs to 4 m tall that formed a nearly impenetrable thicket. Scattered throughout this thicket were a few trees of *Acer saccharinum* (silver maple), *Salix nigra* (black willow), *S. interior* (sandbar willow), and *Fraxinus lanceolata* (green ash). Buttonbush density averaged 12,400 small individuals (2 m tall) near the margin of the swamp to 8,600 larger individuals (4 m tall) in more mature areas near the middle and the eastern edge of the swamp. Here some individuals exceeded 12 cm dbh. *Bidens frondosa* (common beggar-tick) was the only ground layer species commonly encountered while *Lemna minor* (duckweed) floated on the water surface and on the sandy muck.

DISCUSSION

Dry to dry-mesic “black soil” prairies are relatively common in northern Illinois. This community, as described by White and Madany (1978), is dominated by *Schizachyrium scoparium* along with similar to smaller amounts of *Sorghastrum nutans* and *Heterostipa spartea* (Porcupine grass), a species not observed in our plots but observed on the prairies. In contrast, White and Madany (1978) mention that mesic prairies are dominated by *Andropogon gerardii* and S*orghastrum nutans*. All three grasses were found on both of the dry to dry mesic prairies examined. *Schizachyrium scoparium* was the most important grass encountered and was well distributed throughout the prairies, occurring in nearly all plots. *Sorghastrum nutans*, in contrast, had a lower frequency and importance, while *Andropogon gerardi* was uncommon (Table 1). These three grass species were well distributed throughout the prairies, not being clumped and restricted to certain areas, an indication that the community was probably a little drier than typical dry-mesic prairies. The forbs encountered on both prairies were typical of those associated with dry-mesic prairies, and the large number of species encountered in the plots was typical of dry-mesic sites. The few exotic species present and the high species diversity indicated that the prairies were of high natural quality. Management should consist of occasional burns and the removal of trees and forest shrubs by cutting and the use of herbicides.

The two shrub prairies surveyed are the only shrub prairies that the authors have seen during their surveys of the Illinois glacial sand deposits during the past 12 years. Small disturbed remnants of this community type were seen at the Iroquois County Conservation Area, but these lacked many of the species encountered during the present study. This is one of the rarest community types in Illinois and management activities are undoubtedly necessary for maintenance. Burning and/or cutting and herbicide will be required to prevent the encroachment of tree species, but we know of no studies concerning management of this community type. In contrast, the sedge meadow communities are common in all glacial sand deposits in northern Illinois. Many similar examples are known from other sites in Will County, particularly Braidwood Dunes and Savanna Nature Preserve (Phillippe et al. 2008), Hitts Siding Prairie Nature Preserve (Marcum et

al. 2011), and Sand Ridge Savanna Nature Preserve (Phillippe et al. 2011). All are similar in structure and floristic composition.

Presently, we have been unable to find any published literature concerning the species composition and structure of buttonbush shrub swamps other than general information from some site evaluations. Most of this information is from materials in the files of the original Illinois Natural Areas Inventory of the late 1970s (White 1978). White and Madany (1978) recognized this community with at least 50% coverage by shrubs, and less than 20% coverage by trees. A community with less than 50% shrub cover was considered a pond, while a community with more than 20% tree cover would be classified as a swamp. Most important consideration in preserving this community type in sand areas is maintaining a high water table for most of the year.

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Table 1. Frequency (%), mean cover (% of total area), and importance value (I.V.) for species encountered in two dry to dry-mesic "black soil" prairies on sandy loam soil at Wilmington Shrub Prairie Nature Preserve, Will County, Illinois. Species with I.V. <2.4 are listed as others. (*exotics)

Species	South Central Prairie			North Edge Prairie		
	Freq. %	Mean Cover	I.V.	Freq. %	Mean Cover	I.V.
Helianthus mollis	100	21.93	17.6	98	13.02	15.5
Parthenium integrifolium	100	19.71	16.1	100	19.71	20.9
Schizachyrium scoparium	94	15.78	13.4	100	19.50	20.8
Solidago missouriensis	100	14.22	12.6	6	0.42	0.6
Rubus flagellaris	62	13.02	10.5	60	4.43	6.7
Euthamia gymnospermoides	98	9.84	9.8	92	6.11	9.7
Potentilla simplex	100	8.80	9.1	36	1.12	2.8
Sorghastrum nutans	88	6.04	6.9	82	9.66	12.0
**Poa pratensis*	82	3.31	4.9	100	3.67	8.2
Aletris farinosa	56	4.13	4.6	--	--	--
Phlox glaberrima	100	1.45	4.3	92	2.00	6.5
Scleria triglomerata	94	1.67	4.3	30	1.28	2.6
Coreopsis tripteris	88	1.64	4.1	90	5.96	9.4
Euphorbia corollata	86	1.13	3.7	42	0.71	2.8
Antennaria plantaginifolia	58	2.54	3.6	--	--	--
Spiraea tomentosa	48	3.12	3.6	--	--	--
Viola sagittata	88	0.54	3.4	100	2.73	7.5
**Achillea millefolium*	72	1.26	3.3	94	1.57	6.3
Juncus greenei	86	0.43	3.3	20	0.15	1.2
Hieracium canadense	74	0.92	3.1	--	--	--
Liatris pycnostachya	82	0.46	3.1	--	--	--
**Rumex acetosella*	74	0.97	3.1	28	1.26	2.5
Comandra umbellata	70	0.60	2.8	--	--	--
Krigia biflora	60	0.75	2.6	--	--	--
Lespedeza capitata	52	1.01	2.5	36	1.07	2.7
Thelypteris palustris	14	3.00	2.4	--	--	--
Solidago nemoralis	46	1.07	2.3	38	1.76	3.4
Cornus racemosa	32	1.72	2.2	88	9.36	12.0
Dichanthelium acuminatum	54	0.32	2.1	40	0.35	2.4
Andropogon gerardii	16	0.13	0.6	36	2.76	4.1
Solidago altissima	6	0.66	0.6	20	1.80	2.5
Eryngium yuccifolium	--	--	--	92	7.65	11.0
Carex umbellata	--	--	--	88	2.57	6.7
Liatris spicata	--	--	--	36	0.63	2.4
Others	--	12.81	33.5	--	5.00	16.8
Totals		154.98	200.0		126.25	200.0
Bare ground and litter		17.58			19.65	

Table 2. Frequency (%), mean cover (% of total area), and importance value (I.V.) for the species encountered in two shrub prairies at Wilmington Shrub Prairie Nature Preserve, Will County, Illinois. Species with I.V. <1.6 are listed as others. (*exotics)

Species	West Shrub Prairie			East Shrub Prairie		
	Freq. %	Mean Cover	I.V.	Freq. %	Mean Cover	I.V.
Spiraea tomentosa	100	31.80	32.3	64	11.24	12.9
Rubus hispidus	100	19.02	22.7	96	26.20	25.9
Onoclea sensibilis	96	13.34	18.0	76	11.40	14.0
Osmunda regalis	52	14.20	15.0	60	16.34	16.2
Solidago altissima	84	10.10	14.6	8	0.14	0.7
Carex longii	72	4.94	9.7	28	1.50	3.3
Juncus dudleyi	72	3.38	8.5	12	0.06	1.0
Solidago gigantea	56	4.54	8.1	4	0.12	0.4
Eleocharis verrucosa	56	4.16	7.8	36	0.18	3.0
Liatris spicata	56	3.40	7.2	--	--	--
Viola lanceolata	64	2.36	7.0	36	0.38	3.2
Euthamia gymnospermoides	44	3.52	6.3	24	1.10	2.7
Agrimonia parviflora	40	2.34	5.1	8	0.14	0.7
Scirpus cyperinus	28	3.72	5.1	4	0.02	0.3
Dichanthelium acuminatum	40	0.30	3.5	24	0.12	2.0
Vernonia missurica	16	2.40	3.1	32	2.30	4.2
Bryophytes	32	0.46	2.9	80	22.38	22.0
Andropogon virginicus	16	1.44	2.4	--	--	--
Ambrosia artemisiifolia	20	0.10	1.7	--	--	--
Coreopsis tripteris	8	1.20	1.6	--	--	--
Salix humilis	8	1.20	1.6	--	--	--
Bartonia virginica	4	0.02	0.3	28	0.14	2.3
Cornus obliqua	4	0.02	0.3	16	1.82	2.6
Aronia melanocarpa	--	--	--	76	20.50	20.4
Andropogon gerardii	--	--	--	64	4.98	8.6
Carex haydenii/stricta	--	--	--	56	4.16	7.7
Carex pensylvanica	--	--	--	32	3.68	5.2
Spiraea alba	--	--	--	24	4.02	4.7
Lycopus uniflorus	--	--	--	48	0.74	4.3
Aster lanceolatus	--	--	--	40	1.18	4.0
Persicaria amphibium	--	--	--	40	1.08	4.0
Thelypteris palustris	--	--	--	20	2.04	3.0
Carex vulpinoidea	--	--	--	12	1.80	2.3
Carex scoparia	--	--	--	16	0.86	1.9
**Poa pratensis*	--	--	--	16	0.76	1.8
Lysimachia terrestris	--	--	--	16	0.48	1.6
Others	--	3.62	15.2	--	1.78	13.1
Totals		131.58	200.0		143.64	200.0
Bare ground and litter		9.52			3.48	

Table 3. Frequency (%), mean cover (% of total area), relative frequency, relative cover, and importance value (I.V.) for the ground layer species encountered in a sedge meadow at Wilmington Shrub Prairie Nature Preserve, Will County, Illinois. (*exotics)

Species	Freq. %	Mean Cover	Rel. Freq.	Rel. Cover	I. V.
Carex haydenii/stricta	100	27.12	7.9	21.4	29.3
Onoclea sensibilis	100	21.02	7.9	16.7	24.6
Thelypteris palustris	92	13.80	7.2	11.0	18.2
Calamagrostis canadensis	100	12.24	7.9	9.7	17.6
Agrimonia parviflora	92	11.90	7.2	9.5	16.7
Solidago gigantea	76	9.76	6.0	7.8	13.8
Aster praealtus	72	8.88	5.6	7.1	12.7
Hypericum sphaerocarpum	96	5.36	7.5	4.3	11.8
Pycnanthemum virgnianum	68	1.34	5.3	1.0	6.3
Lycopus uniflorus	64	1.20	5.0	1.0	6.0
Galium obtusum	68	0.34	5.3	0.3	5.6
Spiraea alba	28	3.62	2.2	2.9	5.1
Lathyrus palustris	56	0.38	4.4	0.3	4.7
Helianthus grosseserratus	20	3.00	1.6	2.4	4.0
Persicaria amphibium	36	0.48	2.8	0.4	3.2
Boehmeria cylindrica	24	1.38	1.9	1.0	2.9
Lycopus americanus	32	0.36	2.5	0.3	2.8
Euthamia graminifolia	24	0.62	1.9	0.5	2.4
Solidago altissima	12	0.84	0.9	0.7	1.6
Bidens polylepis	16	0.28	1.2	0.2	1.4
Stachys pilosa	16	0.08	1.2	0.1	1.3
Ulmus americana	8	0.62	0.6	0.5	1.1
Eleocharis palustris	12	0.16	0.9	0.1	1.0
Muhlenbergia mexicana	8	0.24	0.6	0.2	0.8
Epilobium leptophyllum	8	0.14	0.6	0.1	0.7
Verbena hastata	8	0.14	0.6	0.1	0.7
Caltha palustris	8	0.04	0.6	--	0.6
Apocynum cannabinum	4	0.12	0.3	0.1	0.4
Cornus obliqua	4	0.12	0.3	0.1	0.4
Rubus allegheniensis	4	0.12	0.3	0.1	0.4
Scrirpis cyperinus	4	0.12	0.3	0.1	0.4
Acer saccharinum	4	0.02	0.3	--	0.3
Epilobium coloratum	4	0.02	0.3	--	0.3
Geum laciniatum	4	0.02	0.3	--	0.3
Liparis loeselii	4	0.02	0.3	--	0.3
**Poa pratensis*	4	0.02	0.3	--	0.3
Totals		125.92	100.0	100.0	200.0
Bare ground and litter		5.50			

Table 4. Plant density (#/ha) and stem density by basal diameter in diameter classes of *Cephalanthus occidentalis* in three vegetation zones of a buttonbush shrub swamp at Wilmington Shrub Prairie Nature Preserve, Will County, Illinois.

Vegetation Zones	Total Shrubs (#ha)	Stems by Basal Diameter Classes (#/ha) 1.0-≤2.5 cm	>2.5-5.0 cm	>5.1+ cm	Total Stems
Swamp Margin Totals	12400	17000	7000	--	24000
Mature Swamp Totals	10400	10000	23000	7200	40200
Old-age Swamp Totals	8600	8600	10000	8000	26600

APPENDIX 1

Vascular plant species encountered at Wilmington Shrub Prairie Nature Preserve, Will County, Illinois, are listed alphabetically by family under major plant groups. Collecting numbers preceded by a P were collected by Loy R. Phillippe. All specimens are deposited in the Illinois Natural History Survey Herbarium, Champaign, Illinois (ILLS). (*exotic species)

FERN AND FERN-ALLIES
Aspleniaceae
Asplenium platyneuron (L.) Oakes: P41187

Equisetaceae
Equisetum arvense L.: P41205
Equisetum fluviatile L.: P40104
Equisetum hyemale L.: P40315

Onocleaceae
Onoclea sensibilis L.: P39779

Ophioglossaceae
Botrychium virginianum (L.) Sw.: P41766
Ophioglossum vulgatum L.: P39778

Osmundaceae
Osmunda cinnamomea L.: P40045
Osmunda regalis L.: P39759

Thelypteridaceae
Thelypteris palustris Schott: P40319

GYMNOSPERMS
Cupressaceae
Juniperus virginiana L.:P42136

MONOCOTS
Alismataceae
Alisma subcordatum Raf.: P40108
Sagittaria brevirostrata Mack. & Bush: P42169
Sagittaria cuneata Sheld.: P40105

Amaryllidaceae
Hypoxis hirsuta (L.) Coville: P39457

Araceae
Arisaema dracontium (L.) Schott: P40326

Commelinaceae
**Commelina communis* L.: P42146
Tradescantia ohiensis Raf.: P39780

Cyperaceae
Bulboschoenus fluviatilis (Torr.) Sojak.: P42161
Carex bicknellii Britt.: P41837
Carex brachyglossa Mack.: P41796
Carex buxbaumii Wahlenb.: P40911
Carex cephalophora Muhl.: P41783
Carex conoidea Schk.: P39462
Carex cristatella Britt.: P40320
Carex haydenii Dewey: observed
Carex longii Mack.: P40210
Carex pellita Willd.: P39768
Carex pensylvanica Lam.: observed
Carex sartwellii Dewey: P41793
Carex scoparia Schk.: P39769
Carex stricta Lam.: observed
Carex swanii (Fern.) Mack.: P39819
Carex umbellata Schk.: P39461
Carex vulpinoidea Michx.: P41794
Cyperus erythrorhizos Muhl.: P40110
Cyperus esculentus L.: P40109
Cyperus strigosus L.: P42150
Eleocharis ovata (Roth) Roem. & Schultes var. *obtusa* (Willd.) Kukenth: P41801
Eleocharis palustris (L.) Roem. & Schultes: P39767
Eleocharis verrucosa (Svenson) Harms: P41836
Eleocharis wolfii Gray: P41799
Rhynchospora capitellata (Mixhx.) Vahl: P42122
Scirpus atrovirens Willd.: P40086
Scirpus cyperinus (L.) Kunth: P39770
Scirpus pendulus Muhl.: P39815
Scleria triglomerata Michx.: P39812

Iridaceae
Iris shrevei Small: P39766
Sisyrinchium albidum Raf.: P39468

Juncaceae
Juncus acuminatus Michx.: P39784
Juncus anthelatus (Wieg.) R.E. Brooks: P41774
Juncus brachycarpus Engelm.: P41782
Juncus dudleyi Wieg.: P39822
Juncus effusus L.: P39756
Juncus greenei Oakes & Tuckerm.: P40124
Juncus interior Wieg.: P41842
Juncus marginatus Rostk.: P40815
Juncus tenuis Willd.: P39776
Juncus torreyi Coville: P40306

Liliaceae
Aletris farinosa L.: P40298
**Asparagus officinalis* L.: P40313

Lilium michiganense Farw.: P40816
Smilacina racemosa (L.) Desf.: P40097

Orchidaceae
Goodyera pubescens (Willd.) R. Br.: P40812
Liparis loeselii (L.) Rich.: P40112
Platanthera clavellata (Michx.) Luer: P40814
Platanthera lacera (Michx.) G. Don: P41807
Spiranthes cernua (L.) Rich.: P42149
Spiranthes magnicamporum Sheviak: P42171

Poaceae
Agrostis gigantea Roth: P39762
Agrostis hyemalis (Walt.) BSP.: P39793
Agrostis perennans (Walt.) Tuckerm.: P40100
Andropogon gerardii Vitman: P40073
Andropogon virginicus L.: P40329
Aristida basiramea Engelm.: P42137
Aristida purpurascens Poir.: P40297
Aristida oligantha Michx.: P42138
**Bromus inermis* Leyss.: P41791
Calamagrostis canadensis (Michx.) P. Beauv.: P39755
Cenchrus longispinus (Hack.) Fern.: P42155
Cinna arundinacea L.: P40102
Dichanthelium acuminatum (Sw.) Gould & Clark: P39820
Dichanthelium clandestinum (L.) Gould: P39777
**Digitaris ischaemum* (Schreb.) Schreb.: P42157
**Digitaria sanguinalis* (L.) Scop.: P42144
**Echinochloa crus-galli* (L.) P. Beauv.: P40106
Elymus canadensis L.: P40066
Elymus virginicus L.: P40111
**Elytrigia repens* (L.) Desv.: P41800
Eragrostis frankii C.A. Meyer: P40128
Festuca subverticillata (Pers.) E.B. Alexeev.: P41765
Glyceria striata (Lam.) Hitchc.: P39794
Heterostipa spartea (Trin.) Barkworth: P39807
Koeleria macrantha (Ledeb.) Spreng.: P39811
Leersia oryzoides (L.) Swartz: P41191
Leersia virginica Willd.: P40325
Muhlenbergia mexicana (L.) Trin.: P40042
Muhlenbergia schreberi J.F. Gmel.: P42165
Panicum capillare L.: P40136
Panicum dichotomiflorum Michx.: P42143
Panicum rigidulum Bosc.: P41193
Panicum virgatum L.: P40077
**Phalaris arundinacea* L.: P41792
**Phragmites australis* (Cav.) Trin.: P40322
**Poa compressa* L.: P41838
**Poa pratensis* L.: P39475
Schizachyrium scoparium (Michx.) Nash: P40119
**Setaria faberi* R.A.W. Herrm.: P40135
Setaria glauca (L.) P. Beauv.: P42158
Sorghastrum nutans (L.) Nash: P40120
Spartina pectinata Link: P41208
Sphenopholis intermedia (Rydb.) Rydb.: P39801
Vulpia octoflora (Walt.) Rydb.: P41785

Smilacaceae
Smilax tamnoides L.: P42147

Typhaceae
Typha latifolia L.: P39771

DICOTS
Acanthaceae
Ruellia humilis Nutt.: P39816

Aceraceae
Acer negundo L.: P42163
Acer saccharinum L.: P39482

Anacardiaceae
Rhus glabra L.: P40138
Toxicodendron radicans (L.) Kuntze: P41203

Apiaceae
Cicuta maculata L.: P39763
Cryptotaenia canadensis (L.) DC.: P40061
Eryngium yuccifolium Michx.: P41188
Oxypolis rigidior (L.) Raf.: P40053
Sanicula canadensis L.: P41763
Sanicula odorata (Raf.) Pryer & Phillippe: P41786
Sium suave Walt.: P40113
Zizia aurea (L.) Koch: P41840

Apocynaceae
Apocynum cannabinum L.: P41805

Asclepiadaceae
Asclepias hirtella (Pennell) Woodson: P40122
Asclepias incarnata L.: P39764
Asclepias sullivantii Engelm.: P40317

Asteraceae
**Achillea millefolium* L.: P39824
Ageratina altissima (L.) R.M. King & H. Robins.: P42115
Ambrosia artemisiifolia L.: P40099
Ambrosia trifida L.: P42147a
Antennaria neglecta Greene: P41835
Antennaria plantaginifolia (L.) Hook.: P39473
**Arctium minus* L.: P42180
Arnoglossum plantagineum Raf.: P39805
Aster dumosus L.: P40115, P40211
Aster ericoides L.: P40310
Aster lanceolatus Willd.: P42175
Aster novae-angliae L.: P40304
Aster ontarionis Wieg.: P40303

Aster pilosus Willd.: P40295
Aster praealtus Poir.: P40081
Aster puniceus L.: P40307
Bidens aristosa (Michx.) Britt.: P42121
Bidens comosa (Gray) Wieg.: P40318
Bidens frondosa L.: P42173
Bidens polylepis Blake: P42129
Cirsium discolor (Muhl.) Spreng.: P40046
**Cirsium vulgare* (Savi) Tenore: P40137
Conyza canadensis (L.) Cronq.: P42156
Coreopsis tripteris L.: P40065
Erechtites hieracifolia (L.) Raf.: P40085
Erigeron annuus (L.) Pers.: P41773
Erigeron strigosus Muhl.: P41844
Eupatoriadelphus maculatus (L.) R.M. King & H. Rob.: P40084
Eupatorium altissimum L.: P40311
Eupatorium perfoliatum L.: P40038
Eupatorium serotinum Michx.: P40131
Euthamia graminifolia (L.) Nutt.: P40090
Euthamia gymnospermoides Greene: P40213
Helenium autumnale L.:P42166
Helianthus grosseserratus Maretns: P40076
Helianthus mollis Lam.: P40093
Helianthus tuberosus L.: P42154
Heliopsis helianthoides (L.) Sweet: P40139
Hieracium canadense Michx.: P42128
Hieracium gronovii L.: P40096
Krigia biflora (Walt.) Blake: P41779
Lactuca biennis (Moench) Fern.: P40067
Lactuca canadensis L.: P40121
Lactuca floridana (L.) Gaertn.: P42147b
Liatris pycnostachya Michx.: P41834
Liatris spicata (L.) Willd.: P40071, P40082
Oligoneuron riddellii (Frank) Rydb.: P40308
Parthenium integrifolium L.: 39810
Prenanthes racemosa Michx.: P40302
Pseudognaphalium obtusifolium (L.) Hilliard & Burtt.: P40292
Ratibida pinnata (Vent.) Barnh.: P39818
Rudbeckia hirta L.: P39806
Rudbeckia laciniata L.: P40047
Rudbeckia subtomentosa Pursh: P40055
Rudbeckia sullivantii Boynt. & Beadle: P40129
Silphium integrifolium Michx.: P40064
Silphium laciniatum L.: P40314
Silphium terebinthinaceum Jacq.: P40059
Solidago altissima L.: P40216
Solidago gigantea Ait.: P40057
Solidago missouriensis Nutt.: P40117
Solidago nemoralis Ait.: P40214
Solidago speciosa Nutt.: P40215
Vernonia fasciculata Michx.: P40114
Vernonia missurica Raf.: P40054

Balsaminaceae
Impatiens capensis Meerb.: P40083

Boraginaceae
Hackelia virginiana (L.) I.M.Johnston: P42116
Lithospermum canescens (Michx.) Lehm.: P39467

Brassicaceae
**Alliaria petiolata* (Bierb.) Cavara & Grande: P39456
Arabis shortii (Fern.) Gl.: P39455
Cardamine bulbosa (Muhl.) BSP.: P39477

Caesalpiniaceae
Chamaecrista fasciculata (Michx.) Greene: P40293
Gleditsia triacanthos L.: P41788

Campanulaceae
Campanula aparinoides Pursh: P39796
Campanulastrum americanum (L.) Small: P40051
Lobelia cardinalis L.: P40092
Lobelia siphilitica L.: P40324
Lobelia spicata Lam.: P40134

Caprifoliaceae
**Lonicera x bella* Zabel: P39799
Sambucus canadensis L.: P39782
Viburnum lentago L.: P39775
Viburnum opulus L.: P42177
Viburnum prunifolium L.: P39478

Caryophyllaceae
**Stellaria media* (L.) Cyrillo: P39480

Chenopodiaceae
**Chenopodium album* L.: P41197

Convolvulaceae
Calystegia sepium (L.) R. Br.: P41798

Cornaceae
Cornus obliqua Raf.: P39758
Cornus racemosa Lam.: P40050

Corylaceae
Corylus americana Walt.: P40101

Cuscutaceae
Cuscuta coryli Engelm.: P40068:

Elaeagnaceae
**Elaeagnus umbellata* Thunb.: P39465

Ericaceae
Vaccinium angustifolium Ait.: P39472

Euphorbiaceae
Acalypha rhomboidea Raf.: P40098

Euphorbia corollata L.: P39813

Fabaceae
Amorpha canescens Pursh: P39808
Dalea purpurea Vent.: P39814
Desmodium canadense (L.) DC.: P40123
Lathyrus palustris L.: P39765, P40079
Lespedeza capitata Michx.: P40116
Lespedeza virginica ((L.) Britt.: P41832
**Lotus corniculatus* L.: P39821
Strophostyles helvula (L.) Ell.: P41195

Fagaceae
Quercus velutina Lam.: P40328

Gentianaceae
Bartonia virginica (L.) BSP.: P40209
Gentiana saponaria L.: P40296

Grossulariaceae
Ribes missouriense Nutt.: P42181

Haloragidaceae
Proserpinaca palustris L.: P39788

Hypericaceae
Hypericum majus (Gray) Britt.: P41189
Hypericum sphaerocarpum Michx.: P39774
Triadenum fraseri (Spach) Gl.: P40088

Lamiaceae
Lycopus americanus Muhl.: P40062
Lycopus uniflorus Michx.: P40103
Lycopus virginicus L.: P42167
Monarda fistulosa L.: P41207
Physostegia virginiana (L.) Benth.: P40078
Prunella vulgaris L. var. *elongata* Benth.: P40305
Pycnanthemum virginianum (L.) Dur. & B.D. Jacks.: P40074
Scutellaria lateriflora L.: P40041
Stachys pilosa Nutt.: P39773
Teucrium canadense L.:P41804

Lauraceae
Sassafras albidum (Nutt.) Nees: P39464

Linaceae
Linum medium (Planch.) Britt.: P40813

Lythraceae
Lythrum alatum Pursh: P39792

Menispermaceae
Menispermum canadense L.: P40303.1

Mimosaceae
Desmanthus illinoensis (Michx.) MacM.: P40132

Molluginaceae
**Mollugo verticillata* L.: P42148

Moraceae
**Maclura pomifera* (Raf.) Schneider: P42170
**Morus alba* L.: P41803

Nyssaceae
Nyssa sylvatica Marsh.: P39761

Oleaceae
Fraxinus lanceolata Borkh.: P41802

Onagraceae
Circaea lutetiana L.: P39800
Epilobium coloratum Biehler: P40044
Epilobium leptophyllum Raf.: P42118
Ludwigia alternifolia L.: P40089
Ludwigia palustris (L.) Ell.: P39790
Ludwigia polycarpa Short & Peter: P39789
Oenothera laciniata Hill: P42142
Oenothera pilosella Raf.: P39772

Oxalidaceae
Oxalis violacea L.: P39459

Phrymaceae
Phryma leptostachya L.: P40056

Phytolaccaceae
Phytolacca americana L.: P41764

Plantaginaceae
Plantago rugelii Decne: P40309

Polemoniaceae
Phlox glaberrima L.: P39757
Polemonium reptans L.: P39476

Polygalaceae
Polygala cruciata L.: P41199
Polygala sanguinea L.: P40118

Polygonaceae
Antenoron virginianum (L.) Roberty & Vautier: P40060
Fallopia scandens (L.) Holub: P40069
Persicaria amphibium (L.) S.F. Gray: P42122
Persicaria coccinea (Muhl.) Greene: P42141
Persicaria hydropiperoides (Michx.) Small: P41202
Persicaria opelousana (Riddell) Small: P42125
Persicaria pensylvanica (L.) Small: P40141
Persicaria punctata (Ell.) Small: P40058
**Rumex acetosella* L.: P39823

Portulacaceae
Claytonia virginica L.: P39458

Primulaceae
Lysimachia lanceolata Walt.: P40212
Lysimachia quadriflora Sims.: P39817
Lysimachia terrestris (L.) BSP.: P39760

Ranunculaceae
Caltha palustris L.: P39483
Ranunculus abortivus L.: P39479
Thalictrum dasycarpum Fisch. & Lall.: P39802

Rhamnaceae
**Frangula alnus* Mill.: P39798
**Rhamnus cathartica* L.: P41806

Rosaceae
Agrimonia parviflora Sol.: P40063
Aronia melanocarpa (Michx.) Ell.: P39463
Fragaria virginiana Duchesne: P39470
Geum canadense Jacq.: P39795
Geum laciniatum Murr.: P39804
Malus ioensis (Wood) Britt.: P39481
**Malus pumila* Mill.: P39466
**Potentilla norvegica* L.: P41787
Potentilla simplex Michx.: P41198
Prunus serotina Ehrh.: P40142
Rosa carolina L.: P42176
**Rosa multifolia* Thunb.: P42117
Rosa palustris Marsh.: P39754
Rubus allegheniensis Porter: P41843
Rubus flagellaris Willd.: P41841
Rubus hispidus L.: P41780
Rubus occidentalis L.: P41767
Spiraea alba DuRoi: P39781
Spiraea tomentosa L.: P40094

Rubiaceae
Cephalanthus occidentalis L.: P39785
Galium obtusum Bigel.: P41204
Galium triflorum Michx.: P40301

Salicaceae
Populus deltoids Marsh.: P41790
Populus tremuloides Michx.: P41797
Salix discolor Muhl.: P41769
Salix humilis L.: P42151
Salix interior Rowlee: P42168
Salix nigra Marsh.: P41789

Santalaceae
Comandra umbellata (L.) Nutt.: P41196

Saxifragaceae
Penthorum sedoides L.: P40125

Scrophulariaceae
Agalinis purpurea (L.) Pennell: P40291
Agalinis tenuifolia (Vahl) Raf.: P40127
Castilleja coccinea (L.) Spreng.: P41778
Chelone glabra L.: P41200
Leucospora multifida (Michx.) Nutt.: P40126
Lindernia dubia (L.) Pennell: P39786
Mimulus alatus Sol.: P40040
Pedicularis canadensis L.: P39809
Pedicularis lanceolata Michx.: P40070
Penstemon digitalis Nutt.: P40133
Scrophularia lanceolata Pursh: P41194
Veronicastrum virginicum (L.) Farw.: P39803

Solanaceae
Solanum carolinense L.: P42145
**Solanum dulcamara* L.: P39783
**Solanum dulcamara* L. f. *albiflorum* House: P39797
Solanum ptychanthum Duanl: P40095

Ulmaceae
Celtis occidentalis L.:P42179
Ulmus americana L.: P40327

Urticaceae
Boehmeria cylindrica (L.) Sw.: P40039
Laportea canadensis (L.) Wedd.: P42164
Parietaria pensylvanica Muhl.: P41762
Pilea fontana (Lunell) Rydb.: P40321
Pilea pumila (L.) Gray: P40300
Urtica gracilis Ait.: P41209

Verbenaceae
Phyla lanceolata (Michx.) Greene: P40107
Verbena hastata L.: P39791
Verbena urticifolia L.: P40048

Violaceae
Viola lanceolata L.: P39471
Viola pratincola Greene: P39469
Viola sagittata Ait.: P39460, P39474

Vitaceae
Parthenocissus quinquefolia (L.) Planch.: P40043
Vitis riparia Michx.: P40087