

Vascular Flora of Long Branch Nature Preserve, Mason County, Illinois

Loy R. Phillippe, Mary Ann Feist, John E. Ebinger
Illinois Natural History Survey, Champaign, Illinois 61820
and
William E. McClain
Illinois State Museum, Springfield, Illinois 62706

ABSTRACT

Long Branch Nature Preserve, Mason County, Illinois is located in the Illinois River sand deposits in the central part of the state. Located on a large stabilized dune, 18 ha of the Preserve is dominated by a mature dry sand prairie community along with small savanna/woodland community. In the dry sand prairie community *Schizachyrium scoparium* (Michx.) Nash had the highest importance value (IV of 55.7 out of 200), followed by *Ambrosia psilostachya* DC. (IV of 28.5), and *Opuntia humifusa* (Raf.) Raf. (IV of 19.0). The savanna/woodland community was dominated by *Quercus marilandica* L. (IV of 180.7) followed by *Q. velutina* Lam. A total of 251 vascular plant species were found on the Preserve including six fern and fern-allies, three gymnosperms, 171 dicots, and 71 monocots. Forty-two non-native species were found, comprising nearly 17% of the flora. The Preserve had a Floristic Quality Index of 48.76 an indication of its high natural quality.

INTRODUCTION

Prairie vegetation was common in Illinois at the time of European settlement and covered about 60% of the state (Iverson et al. 1991). Most was tall-grass, black soil prairie that occurred in the prairie peninsula of northeastern Illinois (Transeau 1935, Schwegman 1973, Ebinger and McClain 1991). Depending upon soil and topography, other prairie types were common, including loess hill prairies, glacial till prairies, sand prairies, and gravel prairies (Schwegman 1973). Sand prairies were relatively common in the northern half of Illinois, most occurring on outwash plains that resulted from erosional events associated with Wisconsin glaciation (Willman and Frye 1970, King 1981).

Two extensive sand regions are the Kankakee sand deposits of northeastern Illinois, and the Illinois River sand deposits in the central part of the state (Gleason 1910, Schwegman 1973). The Kankakee sand deposits were formed when glacial lakes drained about 14,500 years ago after glacial moraines were breached, resulting in the Kankakee Torrent (Willman 1973). The Illinois River sand deposits were formed when waters of the Kankakee Torrent slowed as they entered the broad lowlands of the Illinois River below present day Hennepin.

The structure and composition of forest, woodland, and savanna communities of the Illinois River sand deposits have been studied by various workers (Jenkins et al. 1991, Coates et al. 1992, McClain et al. 2002). Also, Rodgers and Anderson (1979) examined presettlement vegetation, while Anderson and Brown (1983, 1986) determined effects of fire on sand savannas and adjacent forest. Since the studies of Gleason (1910) little information is available concerning the structure and composition of ground layer vegetation of the sand deposits. The only information available are studies of the dry sand prairie remnants at the Henry Allan Gleason Nature Preserve (McClain et al. 2005), and wetland sand communities at Matanzas Prairie Nature Preserve (Feist et al. 2005). The present study was undertaken to determine vascular plant species composition, vegetation structure, and floristic quality of major plant communities at Long Branch Nature Preserve (LBNP) and associated sand prairie remnants nearby.

DESCRIPTION OF THE STUDY SITE

LBNP is located in southwestern Mason County, about 8 km south of Havana, Illinois (NW1/4 S31 T21N R8W). Dedicated in 1989, this Preserve lies within the Illinois River Section of the Mississippi River and Illinois River Sand Area Natural Division (Schwegman 1973). This 38 ha Preserve is situated on a large dune, and though once grazed, an 18 ha section of the dune had never been subjected to major disturbances. The remainder of the Preserve had been farmed and about 4 ha had been planted to pines that have since been removed. The 18 ha dry sand prairie was designated "grade B" by the Illinois Natural Areas Inventory (White 1978). The soils are excessively drained Plainfield sands (Calsyn 1995) that are part of the dune and swale topography known as the Parkland Formation (Willman and Frye 1970).

LBNP has a continental climate with warm summers and cold winters. Based on weather data from Havana, mean annual precipitation is 96.0 cm, with May having the highest rainfall (11.3 cm). Mean annual temperature is 10.8°C with the hottest month being July (average of 24.6°C), and the coldest January (average of -5.0°C). Frost-free days range from 140 to 206, with the average being 173 day per year (Midwestern Regional Climate Center 2002).

METHODS

Between 1991 and 2003 the LBNP has been visited by scientists from the Illinois Natural History Survey. During these visits voucher specimens were collected, identified, and deposited in the herbarium of the Illinois Natural History Survey, Champaign, Illinois (ILLS), and the Stover-Ebinger Herbarium, Eastern Illinois University, Charleston, Illinois (EIU). Determination of non-native species followed Mohlenbrock (2002) and Gleason and Cronquist (1991). Nomenclature follows Mohlenbrock (2002) while the community classification follows those of White and Madany (1978).

In late summer of 2003 six 25 m transects were located randomly along cardinal compass directions in the dry sand prairie of the LBNP. Along each transect, 1 m² quadrates were spaced at 1 m intervals (n=25/transect), odd-numbered quadrates to the right, even-numbered quadrates to the left. A random numbers table was used to determine the number of meters (0 to 9) the quadrate was located from the transect line. Species cover was deter-

mined using the Daubenmire cover class system (Daubenmire 1959) as modified by Bailey and Poulton (1968). Importance value (IV) for ground layer species was determined by summing relative cover and relative frequency. In late summer of 2001 three sites were surveyed on private property just north of the Preserve, two mature dry sand prairie remnants (150 plots), and a disturbed dry sand prairie remnant (50 plots). The same procedure described above was used except the quadrates were $1/4 \text{ m}^2$. These sites on private land were studied as they contained some dry sand prairie remnants that differed from those found on the LBNP.

During the early summer of 2001, a 25 m by 50 m section of open woods along the north edge of LBNP was surveyed. In this small woodland all living woody individuals >10.0 cm dbh were identified and the diameters recorded. From this data, the living-stem density (stems/ha), basal area (m^2/ha), relative density, relative dominance, importance value (IV), and average diameter (cm) were calculated for each species. Determination of the IV follows the procedure used by McIntosh (1957), and is the sum of the relative density and relative dominance (basal area).

The Floristic Quality Index (FQI) was determined using the coefficient of conservatism (CC) assigned to each species by Taft et al. (1997). The CC was determined by assigning each species an integer from 0 to 10 based on the species tolerance to disturbance and its fidelity to habitat integrity. Therefore, the FQI is a weighted index of species richness (N = number of species present), and is the arithmetic product of the average coefficient of conservatism (C-Value = the average of all species CC's) multiplied by the square root of the species richness (\sqrt{N}) of an inventory site: $\text{FQI} = \text{C-Value} (\sqrt{N})$. For relatively small areas that are intensively studied, the FQI gives a rapid means of comparison and an indication of the floristic integrity of the site. Using the FQI along with other floristic measures, such as quadrat-based sampling methods, provides a method of making comparisons among sites. Prairies with an FQI of 35 or higher are considered good quality natural areas (Taft et al. 1997).

RESULTS

A total of 251 vascular plant species within 179 genera and 69 families were documented for LBNP. Of these, six were fern and fern-allies, three gymnosperms, 171 dicots in 131 genera and 55 families, and 71 monocots in 41 genera and eight families (Appendix I). Forty-two non-native (exotic) species were encountered, about 17% of the species present. One threatened species, *Cyperus grayoides*, was encountered (Herkert and Ebinger 2002). The predominant plant families were the Poaceae with 39 species, the Asteraceae with 35 species, and the Cyperaceae with 19 species.

Mature dry sand prairie communities

Of the species found on the LBNP, 45 were present in the 150 quadrats sampled. Of these taxa *Schizachyrium scoparium* (little bluestem) was most important, having a frequency of 93%, an average cover of 26.77, and an IV of 55.7 (Table 1). Also common, *Ambrosia psilostachya* (western ragweed) was second with an IV of 28.5, while *Opuntia humifusa* (common prickly pear) was third with an IV of 19.0. Overall, five native prairie species, that are typical components of dry sand prairies, had IV's greater than 10. All would be expected in good quality dry sand prairie communities in Illinois. No exotic species were

encountered in the plots, and none were observed in the general area of the transects. The FQI for this site was 48.76 with a mean C-Value of 3.084 when all native and exotic species were included in the calculations.

In mature sand prairie remnants just north of LBNP on private land, similar results were obtained. In the larger of these remnants (Dry Sand Prairie # 1), about 3 ha in size, the same dominants were present, little bluestem having an IV of 73.9, followed by western ragweed (IV of 35.1), with common prickly pear being third (IV of 22.7) (Table 1). Most of the subordinate species were the same as in the LBNP mature sand prairie. One non-native species was encountered, *Rumex acetosella* (sour dock), with an IV of 3.5 (Table 1). On the second sand prairie remnant, also on private land and about 0.5 ha in size, the same three species were among the dominants, but *Helianthus occidentalis* (western sunflower) was second with an IV of 37.1, followed by western ragweed and common prickly pear (Table 1).

Disturbed dry sand prairie community

A disturbed sand prairie community that still contained much of its natural character was sampled. This community on private land just north of LBNP, was about 3 ha in size, had been disturbed by past grazing and probably off-road vehicles. Clumps of *Rhus aromatica* (fragrant sumac) and successional trees and shrubs dominated this site. Western ragweed (IV of 32.5) and common prickly pear (IV of 31.6) were important components, but *Conyza canadensis* (horseweed) with an IV of 36.7 was dominant, while *Eragrostis trichodes* (thread love grass), with an IV of 31.7 was third (Table 1). No non-native species were encountered in the plots.

Savanna/woodland communities

The small woodlots on LBNP had closed canopies, but trees became scattered and the canopy open near woodland edges. In the small remnant studied, *Quercus marilandica* (blackjack oak) dominated with an IV of 180.7 (Table 2). *Quercus velutina* (black Oak) was also present, and was also scattered throughout the dry sand prairie.

DISCUSSION

Though 42 non-native, adventive species were collected, most were restricted to disturbances at the edges of the Preserve, in the recently removed pine plantation, or the fallow field on the southern half of the Preserve. One exotic species was found in the study plots, sour dock, which is a pervasive species in most Illinois sand prairies. The fallow field also contained some woody species, most of which were exotics or invasive native species.

Dry sand prairie at LBNP is very similar to that at Henry Allan Gleason Nature Preserve 22 km to the northeast in northern Mason County, Illinois (McClain et al. 2005). Three of the top four dominants were the same with little bluestem dominant and western ragweed and common prickly pear important subdominants. *Tephrosia virginiana* (goat's-rue) was second in IV at Gleason Nature Preserve but was not found in the plots at LBNP. This species is rare at LBNP and had a clumped distribution (Table 1).

Gleason (1910) referred to dry sand prairie communities as the bunch-grass association. At LBNP the dry sand prairie was dominated by 20-40 cm clumps of little bluestem. Nearly circular in outline these clumps formed a dense mass through which few other species could grow. Mostly, other species grew in spaces between clumps. The lack of exotic species between these clumps, the high FQI, the high species diversity, and the large number of conservative prairie species present, indicate that the mature dry sand prairie remnant at the LBNP is of high natural quality.

ACKNOWLEDGMENTS

The authors thank Dr. Gordon Tucker, Eastern Illinois University, for help in the identification of species of Cyperaceae, and John Wilker, Natural Heritage Biologist, Illinois Department of Natural Resources, for his help and advice. The Illinois Department of Natural Resources, Wildlife Preservation Funds supported this project.

LITERATURE CITED

- Anderson, R.C. and L.E. Brown. 1983. Comparative effects of fire on trees in a midwestern savannah and an adjacent forest. *Bulletin of the Torrey Botanical Club* 110:87-90.
- Anderson, R.C. and L.E. Brown. 1986. Stability and instability in plant communities following fire. *American Journal of Botany* 73:364-368.
- Bailey, A.W. and C.E. Poulton. 1968. Plant communities and environmental relationships in a portion of the Tillamook burn, northwestern Oregon. *Ecology* 49:1-13.
- Calsyn, D.E. 1995. Soil survey of Mason County, Illinois. Soil Report 146, University of Illinois Agricultural Experiment Station, Urbana. ix+211 pp.
- Coates, D.T., S.E. Jenkins, and J.E. Ebinger. 1992. Woody vegetation survey of Barkhausen Woods, a closed canopy sand forest in Mason County, Illinois. *Erigenia* 12:1-6.
- Daubenmire, R. 1959. A canopy coverage method of vegetation analysis. *Northwest Science* 33:43-64.
- Ebinger, J.E. and W.E. McClain. 1991. Forest succession in the prairie peninsula of Illinois. *Illinois Natural History Survey Bulletin* 34:375-381.
- Feist, M.A., M.J. Morris, L.R. Phillippe, J.E. Ebinger, and W.E. McClain. 2005. Sand prairie communities of Matanzas Nature Preserve, Mason County, Illinois. (in review)
- Gleason, H.A. 1910. The vegetation of the inland sand deposits of Illinois. *Bulletin of the Illinois State Laboratory of Natural History* 9:21-174.
- Gleason, H.A., and A. Cronquist. 1991. *Manual of the vascular flora of northeastern United States and adjacent Canada*. Second Edition. The New York Botanical Garden, Bronx, New York. lxxv+910 pp.
- Herkert, J.R. and J.E. Ebinger. 2002. editors. *Endangered and Threatened Species of Illinois: Status and Distribution*. Volume 1: Plants. Endangered Species Protection Board, Springfield, Illinois. 161 pp.
- Iverson, L.R., G.L. Rolfe, T.J. Jacob, A.S. Hodgins, and M.R. Jeffords. 1991. *Forests of Illinois*. Illinois Council on Forest Development, Urbana, and Illinois Natural History Survey, Champaign, Illinois.
- Jenkins, S.E., J.E. Ebinger, and W.E. McClain. 1991. Woody vegetation survey of Bishop's Woods, a sand forest in Mason County, Illinois. *Transactions of the Illinois State Academy of Science* 84:20-27.
- King, J.E. 1981. Late Quaternary vegetational history of Illinois. *Ecological Monographs* 51:43-62.

- McClain, W.E., L.R. Phillippe, and J.E. Ebinger. 2005. Floristic assessment of the Henry Allan Gleason Nature Preserve, Mason County, Illinois. *Castanea* (in press)
- McClain, W.E., S.D.Turner, and J.E.Ebinger. 2002. Vegetation of forest communities at the Sand Prairie-Scrub Oak Nature Preserve, Mason County, Illinois. *Transactions of the Illinois State Academy of Science* 95:37-46.
- McIntosh, R.P. 1957. The York Woods. A case history in forest succession in southern Wisconsin. *Ecology* 38:29-37.
- Midwestern Regional Climate Center. 2002. <http://mcc.sws.uiuc.edu>
- Mohlenbrock, R.H. 2002. *Vascular Flora of Illinois*. Southern Illinois University Press, Carbondale, Illinois. xi+490 pp.
- Rodgers, C.S. and R.C. Anderson. 1979. Presettlement vegetation of two prairie peninsula counties. *Botanical Gazette* 140:232-240.
- Schwegman, J.E. 1973. Comprehensive plan for the Illinois nature preserves system. Part 2. The natural divisions of Illinois. Illinois Nature Preserves Commission, Rockford, Illinois. map+32 pp.
- Taft, J.B., G.S. Wilhelm, D. M. Ladd, and L.A. Masters. 1997. Floristic quality assessment for vegetation in Illinois, a method for assessing vegetation integrity. *Erigenia* 15:1-95.
- Transeau, E.N. 1935. The prairie peninsula. *Ecology* 16:423-437.
- White, J. 1978. Illinois Natural Areas Inventory. Technical report. Volume I. Survey methods and results. Illinois Natural Areas Inventory, Urbana. xix+426 pp.
- White, J. and M.H. Madany. 1978. Classification of natural communities in Illinois. Pp. 310-405 in Illinois natural areas inventory. Technical report. (J. White, Editor). Illinois Natural Areas Inventory, Urbana, Illinois.
- Willman, H.B. 1973. Geology along the Illinois waterway - a basis for environmental planning. Illinois State Geological Survey Circular 478. Urbana. 48 pp.
- Willman, H.B. and J.C. Frye. 1970. Pleistocene stratigraphy of Illinois. Illinois State Geological Survey Bulletin 94:1-204.

Table 1. Relative cover and importance values of ground layer species encountered in prairie communities at Long Branch Nature Preserve and adjacent private ground just north of the Preserve.

| Species | LBNP | | Private Property North of LBNP | | | | | |
|--------------------------------------|-----------------------------|------|--------------------------------|------|-------------------------------|------|----------------------------------|------|
| | Dry Sand Prairie (n=100) | | Dry Sand Prairie #1 (n=100) | | Dry Sand Prairie #2 (n=50) | | Disturbed Sand Prairie (n=50) | |
| | Avg. Cover | I.V. | Avg. Cover | I.V. | Avg. Cover | I.V. | Avg. Cover | I.V. |
| <i>Schizachyrium scoparium</i> | 26.77 | 55.7 | 26.68 | 73.9 | 23.38 | 57.8 | -- | -- |
| <i>Amброsia psilostachya</i> | 10.81 | 28.5 | 9.42 | 35.1 | 9.07 | 30.0 | 9.74 | 32.5 |
| <i>Opuntia humifusa</i> | 5.74 | 19.0 | 5.86 | 22.7 | 4.53 | 17.1 | 9.13 | 31.6 |
| <i>Leptoloma cognatum</i> | 5.89 | 16.3 | 1.01 | 4.8 | 0.07 | 0.8 | 0.30 | 1.0 |
| <i>Calamovilfa longifolia</i> | 2.43 | 10.6 | -- | -- | -- | -- | 0.36 | 1.4 |
| <i>Dichanthelium villosissimum</i> | 1.37 | 6.8 | 1.32 | 8.7 | 3.61 | 15.1 | 3.66 | 14.4 |
| <i>Conyza canadensis</i> | 0.85 | 6.5 | 1.15 | 12.5 | 0.96 | 9.6 | 10.77 | 36.7 |
| <i>Carex muhlenbergii</i> | 0.34 | 6.2 | 0.42 | 3.7 | 0.35 | 4.2 | 1.17 | 10.5 |
| <i>Crotonopsis linearis</i> | 0.19 | 5.0 | 0.07 | 2.9 | 0.11 | 4.1 | 0.02 | 0.8 |
| <i>Aristida tuberculosa</i> | 0.61 | 4.9 | 0.32 | 3.8 | -- | -- | 0.03 | 1.2 |
| <i>Commelina erecta</i> | 0.24 | 3.6 | -- | -- | -- | -- | -- | -- |
| <i>Cyperus lupulinus</i> | 0.22 | 3.5 | 0.06 | 1.4 | -- | -- | -- | -- |
| <i>Cyperus schweinitzii</i> | 0.31 | 3.4 | 0.09 | 3.0 | -- | -- | 0.15 | 2.1 |
| <i>Chamaechaerista fasciculata</i> | 0.31 | 3.2 | 0.03 | 1.2 | 0.02 | 0.8 | -- | -- |
| <i>Euthamia gymnospermoides</i> | 0.78 | 2.9 | -- | -- | -- | -- | -- | -- |
| <i>Carex tomsa</i> | 0.21 | 2.2 | 0.03 | 0.3 | -- | -- | 0.84 | 3.7 |
| <i>Lespedeza capitata</i> | 0.28 | 2.2 | -- | -- | -- | -- | -- | -- |
| <i>Cyperus grayoides</i> | 0.10 | 1.5 | -- | -- | -- | -- | -- | -- |
| <i>Eragrostis spectabilis</i> | 0.41 | 1.5 | 0.34 | 1.8 | 0.07 | 0.8 | 0.06 | 0.5 |
| <i>Panicum virgatum</i> | 0.63 | 1.5 | -- | -- | -- | -- | -- | -- |
| <i>Paspalum bushii</i> | 0.32 | 1.5 | 0.52 | 3.3 | 0.12 | 0.9 | 2.17 | 10.0 |
| <i>Croton glandulosus</i> | 0.07 | 1.4 | 0.03 | 1.1 | 0.04 | 1.5 | 0.06 | 2.1 |
| <i>Rhus aromatica</i> | 0.62 | 1.3 | -- | -- | -- | -- | -- | -- |
| <i>Eragrostis trichodes</i> | 0.25 | 1.2 | 1.40 | 5.1 | 1.63 | 5.7 | 8.82 | 31.7 |
| <i>Oenothera rhombipetala</i> | 0.06 | 1.2 | 0.09 | 3.0 | 1.23 | 6.0 | 0.87 | 8.1 |
| <i>Froelichia floridana</i> | 0.07 | 1.1 | 0.18 | 1.9 | 0.03 | 1.2 | 0.12 | 2.7 |
| <i>Antennaria plantaginifolia</i> | 0.03 | 0.9 | -- | -- | -- | -- | -- | -- |
| <i>Chrysopsis camporum</i> | 0.22 | 0.7 | 0.38 | 1.2 | -- | -- | 0.30 | 1.0 |
| <i>Hieracium longipilum</i> | 0.04 | 0.7 | -- | -- | -- | -- | -- | -- |
| <i>Andropogon gerardii</i> | 0.14 | 0.5 | -- | -- | -- | -- | -- | -- |
| <i>Polygonum tenue</i> | 0.02 | 0.5 | -- | -- | 0.02 | 0.7 | -- | -- |
| <i>Pseudognaphalium obtusifolium</i> | 0.02 | 0.4 | 0.20 | 2.3 | 0.07 | 0.8 | 0.36 | 1.4 |
| <i>Solidago speciosa</i> | 0.05 | 0.4 | -- | -- | -- | -- | -- | -- |
| <i>Heterostipa spartea</i> | 0.04 | 0.4 | -- | -- | -- | -- | -- | -- |
| <i>Triplasis purpurea</i> | 0.03 | 0.4 | 0.02 | 0.6 | 0.01 | 0.4 | 0.01 | 0.4 |
| <i>Asclepias hirtella</i> | 0.10 | 0.3 | -- | -- | -- | -- | -- | -- |
| <i>Baptisia bracteata</i> | 0.10 | 0.3 | -- | -- | -- | -- | -- | -- |
| <i>Brickellia eupatorioides</i> | 0.03 | 0.3 | -- | -- | -- | -- | -- | -- |
| <i>Lactuca canadensis</i> | 0.03 | 0.3 | -- | -- | -- | -- | 0.06 | 0.5 |
| <i>Liatris aspera</i> | 0.03 | 0.3 | -- | -- | -- | -- | -- | -- |
| <i>Phlox bifida</i> | 0.01 | 0.3 | -- | -- | -- | -- | -- | -- |
| <i>Sorghastrum nutans</i> | 0.03 | 0.3 | -- | -- | -- | -- | -- | -- |
| <i>Chamaesyce geyeri</i> | 0.01 | 0.1 | -- | -- | 0.02 | 0.8 | -- | -- |
| <i>Chenopodium desiccatum</i> | 0.01 | 0.1 | -- | -- | -- | -- | 0.01 | 0.4 |

Table 1. continued

| Species | LBNP | | Private Property North of LBNP | | | | | |
|--------------------------------|--------------------------|-------|--------------------------------|-------|----------------------------|-------|-------------------------------|-------|
| | Dry Sand Prairie (n=100) | | Dry Sand Prairie #1 (n=100) | | Dry Sand Prairie #2 (n=50) | | Disturbed Sand Prairie (n=50) | |
| | Avg. Cover | I.V. | Avg. Cover | I.V. | Avg. Cover | I.V. | Avg. Cover | I.V. |
| <i>Poinsettia dentata</i> | 0.01 | 0.1 | -- | -- | -- | -- | -- | -- |
| <i>Rumex acetosella</i> | -- | -- | 0.32 | 3.5 | -- | -- | -- | -- |
| <i>Euphorbia corollata</i> | -- | -- | 0.22 | 1.5 | -- | -- | -- | -- |
| <i>Teucrium canadense</i> | -- | -- | 0.04 | 0.7 | -- | -- | -- | -- |
| <i>Helianthus occidentalis</i> | -- | -- | -- | -- | 12.02 | 37.1 | -- | -- |
| <i>Fallopia cristatum</i> | -- | -- | -- | -- | 0.22 | 2.9 | -- | -- |
| <i>Koeleria macrantha</i> | -- | -- | -- | -- | 0.36 | 1.3 | -- | -- |
| <i>Lithospermum croceum</i> | -- | -- | -- | -- | 0.01 | 0.4 | -- | -- |
| <i>Tephrosia virginiana</i> | -- | -- | -- | -- | -- | -- | 1.38 | 5.3 |
| Totals | 60.83 | 200.0 | 50.20 | 200.0 | 57.95 | 200.0 | 50.39 | 200.0 |
| Average bare ground | 42.45 | | 44.85 | | 38.90 | | 59.45 | |

Table 2. Density (#/ha), basal area (m²/ha), relative values, and importance values of woody species in a small woodland at the north edge of Long Branch Nature Preserve, Mason County, Illinois

| Species | Density (#/ha) | Basal Area (m ² /ha) | Relative Density | Relative Dominance | Importance Value | Avg. Diam. (cm) |
|-----------------------------|----------------|---------------------------------|------------------|--------------------|------------------|-----------------|
| <i>Quercus marilandica</i> | 256 | 15.256 | 88.9 | 91.8 | 180.7 | 24.6 |
| <i>Quercus velutina</i> | 16 | 1.064 | 5.7 | 6.4 | 12.1 | 25.0 |
| <i>Juniperus virginiana</i> | 8 | .208 | 2.7 | 1.3 | 4.0 | 18.1 |
| <i>Prunus serotina</i> | 8 | .088 | 2.7 | 0.5 | 3.2 | 11.6 |
| Totals | 288 | 16.616 | 100.0 | 100.0 | 200.0 | |

APPENDIX I.

Vascular plant species encountered at Long Branch Nature Preserve, Mason County, Illinois, listed alphabetically by family in major plant groups. An asterisk indicates non-native species. John E. Ebinger (E) collections are deposited in the Stover-Ebinger Herbarium, Eastern Illinois University, Charleston, Illinois (EIU). Loy R. Phillippe (P) collections are deposited in the Illinois Natural History Survey Herbarium, Champaign, Illinois (ILLS).

FERN AND FERN-ALLIES

Aspleniaceae

Asplenium platyneuron (L.) Oakes P13288

Dryopteridaceae

Woodsia obtusa (Spreng.) Torr. E30370

Equisetaceae

Equisetum hyemale L. P13421

Equisetum laevigatum A. Br. P33301

Ophioglossaceae

Botrychium virginianum (L.) Sw. P13162

Thelypteridaceae

Thelypteris palustris Schott P13309

GYMNOSPERMAE

Cupressaceae

Juniperus virginiana L. P13300

Pinaceae

**Pinus banksiana* Lamb. P13327

**Pinus sylvestris* L. E31198

DICOTS

Acanthaceae

Ruellia humilis Nutt. P13279

Aceraceae

Acer negundo L. P13073

Amaranthaceae

Amaranthus albus L. P13640

Froelichia floridana (Nutt.) Moq. P13555

Froelichia gracilis (Hook.) Moq. P13433

Anacardiaceae

Rhus aromatica Ait. E28425

Toxicodendron radicans (L.) Kuntze
P13561

Apiaceae

Osmorhiza longistylis (Torr.) DC. P13291

Sanicula canadensis L. P13289

Apocynaceae

Apocynum cannabinum L. P33296

Apocynum sibiricum Jacq. P13299

Asclepiadaceae

Ampelamus albidus (Nutt.) Britt. P13414

Asclepias amplexicaulis Small P13274

Asclepias hirtella (Pennell) Woodson
P13314

Asclepias syriaca L. P13315

Asclepias verticillata L. P13419

Asteraceae

**Achillea millefolium* L. E31399

Ageratina altissima (L.) King & Robins.
P13647

Ambrosia artemisiifolia L. E29188

Ambrosia psilostachya DC. E29208

Antennaria plantaginifolia (L.) Hook.
E28416

Arnoglossum atriplicifolia (L.) H. Robins.
P13416

Aster ericoides L. E29411

Aster oblongifolius Nutt. P13629

Aster pilosus Willd. E29412

Bidens bipinnata L. E29201

Bidens comosa (Gray) Wieg. E29185

Bidens connata Muhl. P31290

Brickellia eupatorioides (L.) Shinnery
P13566

Chrysopsis camporum Greene P13319

Cirsium discolor (Muhl.) Spreng. P13613

Conyza canadensis (L.) Cronq. E29209

Coreopsis lanceolata L. P13310

Erigeron annuus (L.) Pers. P13278

Erigeron strigosus Muhl. E28621

Eupatorium serotinum Michx. E30371

Euthamia graminifolia (L.) Nutt. P31291

Euthamia gymnospermoides Greene E29196

Helianthus occidentalis Riddell E28836

**Helianthus petiolaris* Nutt. P13626

Heliopsis helianthoides (L.) Sweet P13646

Hieracium longipilum Torr. P13554

Krigia virginica (L.) Willd. P13140

Lactuca canadensis L. P13553

Liatris aspera Michx. P13603

Pseudognaphalium obtusifolium (L.)

Hilliard & Burt E29206

Senecio plattensis Nutt. P13156

Solidago canadensis L. P13645

Solidago speciosa Nutt. P13628

**Taraxacum officinale* Weber P13074

**Tragopogon dubius* Scop. P13139

Boraginaceae

- Hackelia virginiana* (L.) I. M. Johnston
P33299
Lithospermum croceum Fern. P33302
Lithospermum incisum Lehm. P33306

Brassicaceae

- **Alliaria petiolata* (Bieb.) Cavara & Grande
E28420
Descurainia pinnata (Walt.) Britt. P13055
Draba reptans (Lam.) Fern. P13054
Erysimum capitatum (Dougl.) Greene
P13057
**Lepidium densiflorum* Schrad. P35696
Lepidium virginicum L. P13142

Cactaceae

- Opuntia humifusa* (Raf.) Raf. P13326

Caesalpiniaceae

- Chamaechaerista fasciculata* (Michx.) Greene
E28838
Gleditsia triacanthos L. P13312
Senna marilandica (L.) Link E30372

Campanulaceae

- Campanulastrum americana* (L.) Small
P33459
Triodanis perfoliata (L.) Nieuwl. P13282

Cannabaceae

- **Cannabis sativa* L. P13624

Caprifoliaceae

- **Lonicera maackii* (Rupr.) Maxim. P33295
Sambucus canadensis L. P13290

Caryophyllaceae

- **Holosteium umbellatum* L. P13052
Silene stellata (L.) Ait. f. E30901
**Stellaria media* (L.) Cyrillo P13413

Celastraceae

- Celastrus scandens* L. P33458
Euonymus atropurpurea Jacq. P13062

Chenopodiaceae

- **Chenopodium album* L. E31398
**Chenopodium ambrosioides* L. P13642
Chenopodium desiccatum A. Nels. P13563
Cycloloma atriplicifolium (Spreng.) Coult.
P13415

Convolvulaceae

- **Ipomoea hederacea* (L.) Jacq. P13632

Cornaceae

- Cornus drummondii* C. A. Mey. P13155

Euphorbiaceae

- Chamaesyce geyeri* (Engelm.) Small P13562
Croton glandulosus L. E28828
Crotonopsis linearis Michx. P13558
Euphorbia corollata L. P13283

- Phyllanthus caroliniensis* Walt. E30373
Poinsettia cyathophora (Murr.) Kl. &
Gracke E30374
Poinsettia dentata (Michx.) Kl. & Gracke
P13639

Fabaceae

- Amorpha canescens* Pursh P13427
Baptisia bracteata Ell. P13148
Desmodium illinoensis Gray P33309
Desmodium sessilifolium (Torr.) Torr. &
Gray P33461
Lespedeza capitata Michx. P13612
**Melilotus officinalis* (L.) Pallas. P13321
**Robinia pseudoacacia* L. P13175
Tephrosia virginiana (L.) Pers. P13306

Fagaceae

- Quercus x bushii* Sarg. E29409
Quercus marilandica Muenchh. P13154
Quercus velutina Lam. P13552

Geraniaceae

- Geranium carolinianum* L. P33300

Grossulariaceae

- Ribes missouriense* Nutt. P13071

Hydrophyllaceae

- Ellisia nyctelea* L. P13165

Hypericaceae

- Hypericum majus* (Gray) Britt. P33287
Hypericum mutilum L. P33456

Juglandaceae

- Juglans nigra* L. P13161

Lamiaceae

- Agastache nepetoides* (L.) Ktze. E29191
**Leonurus cardiaca* L. P13295
Lycopus americanus Muhl. P13644
Monarda punctata L. P13564
**Nepeta cataria* L. P13418
Teucrium canadense L. P13428

Lauraceae

- Sassafras albidum* (Nutt.) Nees P13060

Malvaceae

- Callirhoe triangulata* (Leavenw.) Gray
P13407

Menispermaceae

- Menispermum canadense* L. P13302

Molluginaceae

- **Mollugo verticillata* L. P13324

Moraceae

- **Maclura pomifera* (Raf.) Schneider P33281
**Morus alba* L. P13292

Nyctaginaceae

**Mirabilis nyctaginea* (Michx.) MacM.
P13286

Onagraceae

Circaea lutetiana Aschers. & Magnus
P33282

Ludwigia alternifolia L. E29194
Oenothera laciniata Hill P13143
Oenothera rhombipetala Nutt. P13406

Oxalidaceae

Oxalis stricta L. P13273

Phytolaccaceae

Phytolacca americana L. P13325

Plantaginaceae

Plantago patagonica Jacq. P13269

Polemoniaceae

Phlox bifida Beck P13065

Polygalaceae

Polygala polygama Walt. P33310
Polygala verticillata L. P33303

Polygonaceae

Fallopia cristata (Engelm. & Gray) Holub.
P31292
Persicaria coccinea (Muhl.) Greene P33297
**Persicaria hydropiper* (L.) Opiz. P33286
Persicaria pensylvanicum (L.) Small
P33284
Persicaria punctata (Ell.) Small E29193
Polygonum tenue Michx. P31293
**Rumex acetosella* L. P13276

Primulaceae

Androsace occidentalis Pursh P13053

Ranunculaceae

Anemone virginiana L. P13301
Clematis virginiana L. P33308
Ranunculus abortivus L. P13164

Rhamnaceae

Ceanothus americanus L. P13272

Rosaceae

Fragaria virginiana Duchesne P13146
Geum canadense Jacq. P13287
**Potentilla recta* L. P13320
Potentilla simplex Michx. P13147
Prunus serotina Ehrh. P13160b
Prunus virginiana L. P13072
Rosa carolina L. P13313
Rosa suffulta Greene P13275
Rubus argutus Link P13437
Rubus flagellaris Willd. P13149
Rubus occidentalis L. P13150

Rubiaceae

Diodia teres Walt. P13606

Galium aparine L. P13169
Galium circaeans Michx. P13305

Rutaceae

Ptelea trifoliata L. P13303
Zanthoxylum americanum Mill. P13067

Salicaceae

Populus tremuloides Michx. P13144
Salix humilis Marsh. P13064

Scrophulariaceae

Nuttallanthus canadensis (L.) D. Sutton
P13141
Penstemon pallidus Small P13145
**Verbascum thapsus* L. P13420

Solanaceae

Physalis heterophylla Nees P13304
Solanum carolinense L. P13318

Ulmaceae

Celtis occidentalis L. P13063
Ulmus americana L. P13056
Ulmus rubra Muhl. P13061

Urticaceae

Parietaria pensylvanica Muhl. P13294

Verbenaceae

Verbena stricta Vent. P13432

Violaceae

**Viola rafinesquii* Greene P13051
Viola sororia Willd. P13069

Vitaceae

Parthenocissus quinquefolia (L.) Planch.
P33307
Vitis riparia Michx. P13151

MONOCOTS**Araceae**

Arisaema triphyllum (L.) Schott P13070

Commelinaceae

Commelina erecta L. P13617
Tradescantia ohimensis Raf. P13163

Cyperaceae

Bulbostylis capillaris (L.) C. B. Clarke
P13410
Carex amphibola Steud. P13171
Carex blanda Dewey E28422
Carex jamesii Schwein. P13166
Carex lurida Wahl. P33289
Carex muhlenbergii Schk. P13172
Carex oligocarpa Schk. P13296
Carex pensylvanica Lam. P13059
Carex scoparia Schk. P35695
Carex stipata Muhl. P35694
Carex tonsa (Fern.) Bickn. P13308
Carex tribuloides Wahl. P33291
Cyperus esculentus L. P13408

Cyperus grayoides Mohlenbr. P13638
Cyperus lupulinus (Spreng.) Mareks P13633
Cyperus schweinitzii Torr. P36151
Cyperus strigosus L. P33288
Eleocharis ovata (Roth) Roem. & Schultes
 P33457
Scirpus atrovirens Willd. P33283

Iridaceae

**Belamcanda chinensis* (L.) DC. P13625
Sisyrinchium albidum Raf. E28415
Sisyrinchium campestre Bickn. P13422

Juncaceae

Juncus acuminatus Michx. P33293
Juncus interior Wieg. P13316
Juncus marginatus Rostk. P33292

Liliaceae

**Allium vineale* L. P35698
 **Asparagus officinalis* L. P13160
Smilacina stellata (L.) Desf. P13170

Poaceae

Agrostis hyemalis (Walt.) BSP. E28424
Andropogon gerardii Vitman P13615
Aristida desmantha Trin. & Ripr. P13567
Aristida tuberculosa Nutt. P13621
Bouteloua hirsuta Lag. P33305
 **Bromus commutatus* Schrad. E28624
 **Bromus inermis* Leyss. P13270
 **Bromus tectorum* L. P13159
Calamovilfa longifolia (Hook.) Scribn.
 P13550
Cenchrus longispinus (Hack.) Fern. P13409
Dichantherium acuminatum (Sw.) Gould &
 Clark P33285
Dichantherium depauperatum (Muhl.)
 Gould E28429
Dichantherium oligosanthes (Schult.) Gould
 P13284

Dichantherium perlongum (Nash) Freckm.
 P13297
Dichantherium villosissimum (Nash)
 Freckm. P13285
 **Digitaria ischaemum* (Schreb.) Schreb.
 P13607
 **Digitaria sanguinalis* (L.) Scop. P13641
 **Echinochloa crus-galli* (L.) Beauv. E30375
Elymus villosus Muhl. P13293
 **Eragrostis cilianensis* (All.) Vign. P13429
Eragrostis spectabilis (Pursh) Steud.
 P13551
Eragrostis trichodes (Nutt.) Wood. P13549
Heterostipa spartea (Trin.) Barkworth
 P13271
Koeleria macrantha (Ledeb.) Spreng.
 P13307
Leptoloma cognatum (Schult.) Chase
 P31287
Panicum capillare L. P13434
Panicum virgatum L. P13609
Paspalum bushii Nash P13601
 **Poa pratensis* L. P13167
Schizachyrium scoparium (Michx.) Nash
 P13610
 **Secale cereale* L. P13322
 **Setaria faberi* F. Herrm. P33294
 **Setaria viridis* (L.) Beauv. P13435
Sorghastrum nutans (L.) Nash P13630
Sporobolus clandestinus (Biehler) Hitchc.
 P13634
Sporobolus cryptandrus (Torr.) Gray
 P13627
Tridens flavus (L.) Hitchc. P31288
Triplasis purpurea (Walt.) Chapm. P13623
Vulpia octoflora (Walt.) Rydb. E28414

Smilacaceae
Smilax hispida Muhl. P13152