

BOTANICAL INVENTORY OF PRAIRIE RIDGE STATE NATURAL AREA, JASPER COUNTY, ILLINOIS

Gordon C. Tucker¹, Bob Edgin², Sean C. Jones^{1,3} and John E. Ebinger¹: ¹Department of Biological Sciences, Eastern Illinois University, Charleston, Illinois 61920; ²Illinois Nature Preserves Commission, 9940 E. 500th Ave., Newton, Illinois 62448 USA

ABSTRACT. Prairie Ridge State Natural Area, located in southeastern Illinois, is one of the most significant grassland habitat complexes in Illinois and well known for supporting the only population of Greater Prairie Chickens (*Tympanuchus cupido*) in the state. On the site, we found 544 vascular plant species, of which 438 are native (including the state-endangered *Penstemon tubaeiflorus*), and one new state record (*Schoenoplectus americanus*). Exotic species accounted for 106 species (19.5%). Grassland communities were of two types: cool-season grasslands, managed by mowing and dominated by *Agrostis gigantea*, *Bromus inermis*, *Dactylis glomerata*, *Festuca arundinacea*, and *Poa pratensis*; and warm-season prairie grasslands, managed by fire or mowing, and dominated by *Andropogon gerardii*, *Schizachyrium scoparium*, and *Sorghastrum nutans*. Two small forest tracts were examined; both were immature second-growth mesic upland forests with an overstory dominated by *Quercus alba*, *Carya ovata*, and *Acer saccharinum*.

Keywords: Grassland communities, Illinois, prairie chickens, prairie restoration

At the time of European settlement, prairie vegetation covered about 60% of Illinois (Iverson et al. 1991). Most was “black soil” tall-grass prairie of the prairie peninsula that once stretched throughout much of the central United States and adjacent Canada (Transeau 1935). Nearly all disappeared after the arrival of European settlers. Small remnants remain in pioneer cemeteries, along a few railroad tracks, and in places of rocky or thin soil where it was not profitable to plow. In recent times, mostly within the last 40 years, numerous attempts have been made to recreate and restore prairie communities in Illinois (McClain 1986, 1997; Packard & Mutel 1997). Rarely, natural succession processes also created prairie communities.

Prairie Ridge State Natural Area is well known for supporting the only population of Greater Prairie Chickens (*Tympanuchus cupido*) in the state (McFall & Karnes 1995; Simpson & Esker 1997). There is abundant information on the site’s fauna, especially breeding birds (Simpson & Esker 1997, Simpson 1998). However, only two studies have focused on the plant life, a natural prairie restoration, associated with a pioneer cemetery (Edgin & Ebinger 2000), and

five tracts of prairie restorations surveyed by Kessler et al. (2001). The purpose of the present study was to survey the vascular flora of Prairie Ridge State Natural Area, and to determine the composition and structure of the vegetation on recently established grassland and recently acquired forest communities present on this 1093 ha natural area.

STUDY AREA

Prairie Ridge is included in the Illinois Natural Areas Inventory and is rated as one of the five most significant grassland habitat complexes in Illinois (Simpson & Esker 1997). This natural area consists of many isolated tracts of mostly abandoned farmland located approximately 11 km southwest of Newton, Jasper County, Illinois, near the small town of Bogota (S19 through 36 T6N R9E; N38.911,° W88.189°) (Fig. 1). The natural area is located within the Effingham Plain Section of the Southern Till Plain Natural Division, an area which encompasses most of the Illinoian glacial till in southern Illinois (Schwegman 1973). The Effingham Plain Section is a relatively flat plain drained by the Kaskaskia River and the Little Wabash River, and was glaciated approximately 125,000 years ago. In pre-settlement times it was covered mostly with prairie vegetation, although upland flatwoods and savanna com-

Correspondence: Gordon C. Tucker; e-mail: gctucker@eiu.edu

³ *Present address:* 715 Virginia Drive, Oklahoma City, Oklahoma 73107



Figure 1.—Map showing location of Prairie Ridge State Natural Area, Jasper County, Illinois.

munities were common depending on soil type, while forests were generally associated with dissected topography along rivers and streams. Presently, in Jasper County about 84% of the land is devoted to agriculture, 5% to woodland, and the remainder cultural (Barmstedt 1992).

Soils throughout the study area are nearly level to gently sloping, poorly-drained, grayish brown and friable silt loam composed of Illinoian till overlain with shallow loess deposits on the broad ridges and knolls of the uplands (Willman et al. 1975; Barmstedt 1992). The climate is continental and characterized by hot, humid summers and cold winters. Precipitation averages 104.8 cm, with July having the highest rainfall (11.1 cm). Mean annual temperature is 11.4 °C, the hottest month being July (average of 24.3 °C), and the coldest being January (average of -3.1 °C). The average

number of frost-free days is 183 (Newton, Illinois, Midwestern Regional Climate Center 2009).

METHODS

Prairie Ridge State Natural Area was visited every 2–3 weeks during the 2005 and 2006 growing seasons and sporadically until the fall of 2008. During each trip, all flowering or fruiting species encountered were collected and voucher specimens deposited in the Stover-Ebinger Herbarium of Eastern Illinois University, Charleston, Illinois (EIU), with duplicates sent to the Illinois Natural History Survey Herbarium, Champaign, Illinois (ILLS). Nomenclature follows Mohlenbrock (2002) and the assignment of non-native status follows Taft et al. (1997) and Mohlenbrock (2002) (Appendix I).

Ground-layer species were analyzed from late August through early October 2005 using m^2 plots located at 1 m intervals along a randomly placed 25 m transect ($n = 25/\text{transect}$) in each of 12 grasslands with varying histories of management. Even-numbered plots were placed to the right, odd-numbered to the left. Herbaceous species, shrubs, and tree seedlings to 0.4 m in height were included in the sampling. Percent cover for each species and bare ground and litter were determined by using the Daubenmire (1959) cover class system as modified by Bailey & Poulton (1968) (class 1 = 0–1%, class 2 = 2–5%, class 3 = 6–25%, class 4 = 26–50%, class 5 = 51–75%, class 6 = 76–95%, and class 7 = 96–100%). Mean cover, relative cover, frequency (%), relative frequency, and importance value (I.V.) were determined for each species. As used here, I.V. is the sum of the relative frequency and relative cover, and has a maximum value of 200.

During the late summer of 2008, transects (50 m \times 100 m) were established in two small woodlots located along the western edge of the natural area. Both woodlots were surveyed by dividing the core area into eight contiguous quadrats 25 m on a side (0.5 ha). In each quadrat all living woody stems (≥ 10.0 cm dbh) were identified and their diameters recorded. From these data, the living-stem density (stems/ha), basal area (m^2/ha), relative density, relative dominance, importance value (I.V.), and average diameter (cm) were calculated for each species. Determination of the I.V. follows the procedure used by McIntosh (1957) and is the sum of the relative density and relative dominance (basal area).

Table 1.—Total species encountered in the study area, average species/plots, average importance value (I.V.) and average mean cover (M.C.) for the dominant species, and a list of the common associated herbaceous species in the grassland habitats examined at the at Prairie Ridge State Natural Area, Jasper County, Illinois.

	<i>Sorghastrum nutans</i> <i>Solidago canadensis</i> Community (2 transects)	<i>Schizachyrium scoparium</i> <i>Solidago canadensis</i> Community (3 transects)
Total species	13	35
Species/plot	3.22	4.01
Dominant species	<i>Sorghastrum nutans</i>	<i>Solidago canadensis</i>
Average I.V. and M.C.	I.V. = 68.4 M.C. = 29.6	I.V. = 57.8 M.C. = 21.2
Subdominant species	<i>Solidago canadensis</i>	<i>Schizachyrium scoparium</i>
Average I.V. and M.C.	I.V. = 67.6 M.C. = 27.9	I.V. = 44.3 M.C. = 14.8
Associated species	<i>Festuca arundinacea</i> <i>Poa pratensis</i> <i>Pycnanthemum pilosum</i> <i>Rubus allegheniensis</i> <i>Solidago juncea</i>	<i>Achillea millefolium</i> <i>Aster pilosus</i> <i>Festuca arundinacea</i> <i>Phleum pratense</i> <i>Setaria glauca</i> <i>Sorghastrum nutans</i>
	<i>Andropogon gerardii</i> <i>Solidago canadensis</i> Community (4 transects)	<i>Solidago canadensis</i> <i>Rubus allegheniensis</i> Community (3 transects)
Total species	27	33
Species/plots	3.97	5.00
Dominant species	<i>Solidago canadensis</i>	<i>Solidago canadensis</i>
Average I.V. and M.C.	I.V. = 45.8 M.C. = 19.3	I.V. = 47.4 M.C. = 24.7
Subdominant species	<i>Andropogon gerardii</i>	<i>Rubus allegheniensis</i>
Average I.V. and M.C.	I.V. = 43.9 M.C. = 18.6	I.V. = 12.2 M.C. = 5.0
Associated species	<i>Ambrosia artemisiifolia</i> <i>Aster pilosus</i> <i>Festuca arundinacea</i> <i>Poa pratensis</i> <i>Rubus allegheniensis</i> <i>Sorghastrum nutans</i>	<i>Achillea millefolium</i> <i>Ambrosia artemisiifolia</i> <i>Aster pilosus</i> <i>Bromus inermis</i> <i>Dactylis glomerata</i> <i>Festuca arundinacea</i> <i>Trifolium pratense</i>

Woody understory composition and density (stems/ha) were determined using nested circular plots 0.0001, 0.001, and 0.01 ha in size. The nested plots were located at about 25 m intervals along line transects through the study areas. Four additional 0.0001 ha circular plots were located 6 m from the center points along cardinal compass directions. In the 0.0001 ha plots, woody seedlings (≤ 50 cm tall) and all shrubs were counted; in the 0.001 ha circular plots small saplings (> 50 cm tall and < 2.5 cm dbh) were recorded; and in the 0.01 ha circular plots large saplings (2.5–9.9 cm dbh) were tallied. Within each woodlot, 20 large and small plots and 100 seedling plots were sampled.

RESULTS

The preserve supports a total of 544 vascular plant taxa in 108 families (Appendix I). Ferns, fern-allies, and gymnosperms were represented by 10 taxa in 7 families. Of the remaining taxa, 165 were monocots in 17 families, and 369 were dicots in 84 families. Non-native (exotic) species accounted for 106 taxa, or 19.5% of the species collected. The largest plant families were Poaceae with 78 species, Asteraceae with 72 species, and Cyperaceae with 46 species. The only state-endangered species encountered was *Penstemon tubaeiflorus*, although *Silene regia* has been planted in the natural area and

Table 2.—Densities by diameter classes (stems/ha), total density (stems/ha), basal areas (m²/ha), relative values, importance values, and average diameters of woody species in a *Quercus alba* dominated, immature second growth mesic upland forest (Area A) at Fuson Farm, Prairie Ridge State Natural Area, Jasper County, Illinois.

Species	Diameter classes (cm)					Total #/ha	Basal area M ² /ha	Rel. den.	Rel. dom.	I.V.	Avg. diam. (cm)
	10–19	20–29	30–39	40–49	50+						
<i>Quercus alba</i>	–	14.0	40.0	48.0	16.0	118.0	16.46	50.8	60.3	111.1	41.2
<i>Carya ovata</i>	12.0	14.0	2.0	2.0	–	30.0	1.430	12.9	5.2	18.1	23.0
<i>Acer saccharum</i>	2.0	–	2.0	12.0	2.0	18.0	2.438	7.8	8.9	16.7	40.0
<i>Fraxinus lanceolata</i>	–	4.0	6.0	2.0	4.0	16.0	2.446	6.9	9.0	15.9	41.3
<i>Quercus rubra</i>	–	–	2.0	4.0	6.0	12.0	2.532	5.2	9.3	14.5	50.7
<i>Carya glabra</i>	14.0	6.0	4.0	–	–	24.0	0.900	10.3	3.3	13.6	20.9
<i>Carya cordiformis</i>	–	2.0	2.0	2.0	–	6.0	0.536	2.6	2.0	4.6	32.6
<i>Prunus serotina</i>	–	–	–	2.0	–	2.0	0.374	0.9	1.4	2.3	48.8
<i>Carya tomentosa</i>	2.0	2.0	–	–	–	4.0	0.134	1.7	0.5	2.2	20.5
<i>Ostrya virginiana</i>	2.0	–	–	–	–	2.0	0.018	0.9	0.1	1.0	10.7
Total	32.0	42.0	58.0	72.0	28.0	232.00	27.276	100.0	100.0	200.0	

persists (Simpson & Esker 1997; Illinois Endangered Species Protection Board 2005).

Of the many species recorded for this natural area a few were not listed by Mohlenbrock (2002). These include the hybrid between *Acer rubrum* and *A. saccharinum* (*A. × freemanii*), which has occasionally been collected in southern Illinois (EIU herbarium has specimens from Coles, Jasper and Massac counties). The hybrid grass, *Elymus canadensis* × *E. hystrix*, was also found, although this taxon has rarely been observed throughout the range of both parents (Stephen Darbyshire, Agriculture Canada, Ottawa, pers. commun.). Addi-

tionally, *Schoenoplectus americanus* (Cyperaceae; synonym *Scirpus olneyi*), a new state record was found in the natural area by Tucker (2001), which was probably brought in by migrating waterfowl, as was the case in neighboring Missouri (Yatskievych 2001). Two other taxa, *Carex missouriensis* (Cyperaceae) and *Bothriochloa laguroides* (Poaceae), are new to the state due to recent taxonomic and nomenclatural changes.

Management of this natural area has involved the development of grasslands that include both introduced exotic grass and native prairie species. During the present study, 12

Table 3.—Densities by diameter classes (stems/ha), total density (stems/ha), basal area (m²/ha), relative values, importance value, and average diameters of woody species in an *Acer saccharum* dominated, immature second-growth mesic upland forest (Area B) at CIPS Tract, Prairie Ridge State Natural Area, Jasper County, Illinois.

Species	Diameter classes (cm)					Total #/ha	Basal area M ² /ha	Rel. den.	Rel. dom.	I.V.	Avg diam. (cm)
	10–19	20–29	30–39	40–49	50+						
<i>Acer saccharum</i>	40.0	74.0	26.0	10.0	4.0	154.0	8.964	46.0	34.2	80.2	25.8
<i>Quercus alba</i>	–	12.0	10.0	30.0	18.0	70.0	10.49	21.0	40.1	61.1	42.7
<i>Carya ovata</i>	32.0	20.0	10.0	2.0	–	64.0	2.636	19.2	10.1	29.3	21.6
<i>Fraxinus lanceolata</i>	–	–	8.0	2.0	2.0	12.0	1.804	3.6	6.9	10.5	42.1
<i>Carya glabra</i>	–	2.0	4.0	–	2.0	8.0	0.918	2.4	3.5	5.9	36.8
<i>Ulmus rubra</i>	6.0	2.0	–	–	–	8.0	0.158	2.4	0.6	3.0	15.4
<i>Ulmus americana</i>	8.0	–	–	–	–	8.0	0.116	2.4	0.4	2.8	13.3
<i>Juglans nigra</i>	–	–	–	2.0	–	2.0	0.348	0.6	1.3	1.9	47.1
<i>Quercus stellata</i>	–	–	–	2.0	–	2.0	0.352	0.6	1.3	1.9	47.3
<i>Prunus serotina</i>	–	4.0	–	–	–	4.0	0.160	1.2	0.6	1.8	22.5
<i>Carya tomentosa</i>	–	–	–	2.0	–	2.0	0.252	0.6	1.0	1.6	40.0
Total	86.0	114.0	58.0	50.0	26.0	334.0	26.204	100.0	100.0	200.0	

Table 4.—Densities by diameter classes (stems/ha) of woody understory species in a *Quercus alba* dominated (Area A) and an *Acer saccharum* dominated (Area B), immature second growth mesic upland forests at Fuson Farm, Prairie Ridge State Natural Area, Jasper County, Illinois.

Species	Seedlings		Small saplings		Large saplings	
	Area A	Area B	Area A	Area B	Area A	Area B
<i>Acer saccharum</i>	11700	55125	—	—	5	15
<i>Prunus serotina</i>	6500	1875	—	—	—	—
<i>Fraxinus lanceolata</i>	4900	5500	100	—	—	—
<i>Carya glabra</i>	2000	1625	—	—	5	—
<i>Parthenocissus quinquefolia</i>	1400	3375	—	—	—	—
<i>Rubus allegheniensis</i>	1000	500	—	—	—	—
<i>Quercus alba</i>	700	500	—	—	—	—
<i>Cercis canadensis</i>	500	—	—	—	—	—
<i>Quercus rubra</i>	500	125	—	—	—	—
<i>Sassafras albidum</i>	500	—	—	—	—	—
<i>Morus alba</i>	400	125	—	—	—	—
<i>Ulmus</i> spp.	400	22750	—	—	—	—
<i>Ostrya virginiana</i>	300	—	—	—	5	—
<i>Toxicodendron radicans</i>	300	125	—	—	—	—
<i>Celastrus scandens</i>	200	625	—	—	—	—
<i>Celtis occidentalis</i>	200	875	—	—	—	5
<i>Malus ioensis</i>	200	—	—	—	—	—
<i>Carya ovata</i>	200	750	—	—	5	—
<i>Rubus occidentalis</i>	100	—	—	—	—	—
<i>Symphoricarpos orbiculatus</i>	—	1875	—	—	—	—
<i>Ribes missouriense</i>	—	125	—	—	—	—
<i>Vitis vulpina</i>	—	125	—	—	—	—
Total	32000	96000	100	—	20	20

grasslands were surveyed to determine species composition. All sites were originally cultivated fields that were seeded to grasses between 1990 and 2004, nine fields to native prairie grasses, and three fields to cool-season, exotic grasses.

The dominant species in the grasslands examined was dependent, in part, on the species originally planted on the site. Generally, the grass species planted is presently the dominant species along with *Solidago canadensis*, a common native prairie species that enters most fallow fields, prairie plantings, and other disturbed habitat in the Southern Till Plain Natural Division (Kessler et al. 2001). This perennial member of the Asteraceae, with its wind-dispersed achenes and well developed rhizome system, readily becomes established and persists (Transeau 1935).

Nine tracts were originally planted to various native prairie grass species, and always had *Solidago canadensis* as the dominant or sub-dominant species (Table 1). Usually each of the nine fields was planted to *Sorghastrum nutans* and either *Andropogon gerardii* or *Schizachyrium scoparium* as a second native grass species

(Simpson & Esker 1997). Also, based upon the results of the vegetation surveys cool-season grasses were sometimes important associates in these prairie grass plantings, indicating that they were probably in the seed mix (Table 1).

Solidago canadensis and *Rubus allegheniensis* were the only species consistently found in the fields planted to cool-season grasses (Table 1). Usually a mixture of two cool-season grass taxa was seeded in each field, the most important species planted being *Agrostis gigantea* (red top), *Bromus inermis* (awnless brome), *Dactylis glomerata* (orchard grass), *Festuca arundinacea* (tall fescue), and *Poa pratensis* (bluegrass).

Both of the small woodlots examined were immature second-growth upland forests located in slightly dissected terrain close to the eastern edge of Newton Lake. The woodlots were classified as dry-mesic to mesic upland forests with the shade-intolerant, fire-resistant *Quercus alba* and *Carya ovata* among the top three species in importance. Shade-tolerant, fire-sensitive species were also present with *Acer saccharum* the most common followed by *Fraxinus lanceolata* (Tables 2, 3). The

understory in these woodlots was very open; few small or large saplings were present, though woody seedlings were extremely common (Table 4).

DISCUSSION

Prairie Ridge State Natural Area is one of only five biologically significant grassland habitat preserves in the state (Simpson & Esker 1997). It also is one of the 30 areas identified in the Illinois Department of Natural Resources Inventory of Resource Rich Areas in Illinois (Suloway et al. 1996). Since the original purchase in 1962, the primary goal at Prairie Ridge has been the development of a grassland ecosystem capable of maintaining viable populations of grassland bird species, including both permanent residents and migratory species, with an emphasis on endangered and threatened bird species (Simpson & Esker 1997). A second goal was to reconstruct the typical prairie vegetation that was representative of the Southern Till Plain of Illinois in pre-settlement times (Schwegman 1973).

Presently, within this natural area there are numerous fields similar to those surveyed in this study. These fields were originally cultivated and now have established populations of cool-season exotic grass, or populations of native prairie bunch-grasses. These plantings have been maintained by rotary mowing and prescribed burning. Over time, seeds and fruits of many prairie species become established in these fields. Some of these fields, where succession toward prairie communities has taken place, were studied by Kessler et al. (2000). On these fields prairie forbs were usually added to the original seed mix during planting. Also, forbs have entered the fields from surrounding fence-rows, roadsides, and small prairie remnants. In these fields *Sorghastrum nutans*, *Andropogon gerardii*, *Schizachyrium scoparium*, and *Panicum virgatum* were the dominant grasses while *Solidago canadensis* was the dominant forb. One field, originally planted in 1991, had 17 native prairie forb and shrub species present when studied in 1998 (Kessler et al. 2000).

Similar results, on another site of the natural area, were obtained by Edgin & Ebinger (2000) in a successional prairie that was cropped until the mid-1950s. Since that time the site has remained fallow, and has been colonized by prairie species from surrounding roadsides, fence-rows, and a small prairie remnant in a

cemetery near the northwest corner of the site. More than 144 species were recorded for this field, the majority being native prairie grasses and forbs, but also including 10 exotic and 20 woody species. *Andropogon gerardii* and *Schizachyrium scoparium* were the dominant grasses, while more than 90 native prairie forbs and shrubs were found.

Native grassland habitats come at a premium in Illinois, and so do many grassland birds. Prairie Ridge State Natural Area is the best place to find many of these species (Simpson & Esker 1997). While the grasslands and marshes of Prairie Ridge are the most unusual feature of this area, a wide variety of habitats is nearby, including shrubby areas, small woodlots, and Newton Lake. All parts of the natural area are managed to create the best habitat for these endangered and threatened species. As a result of this management, native prairie is becoming established.

ACKNOWLEDGMENTS

The authors would like to thank the Illinois Department of Natural Resources for permission to study the natural area, and particularly to Terry Esker and Scott Simpson of the Department for help and encouragement they provided during the study.

LITERATURE CITED

- Bailey, A.W. & C.E. Poulton. 1968. Plant communities and environmental relationships in a portion of the Tillamook Burn, northwestern Oregon. *Ecology* 49:1-13.
- Barmstedt, M.W. 1992. Soil survey of Jasper County, Illinois. United States Department of Agriculture, Soil Conservation Service in cooperation with the Illinois Agricultural Experiment Station.
- Daubenmire, R. 1959. A canopy coverage method of vegetation analysis. *Northwest Science* 33:43-64.
- Illinois Endangered Species Protection Board. 2005. Checklist of Endangered and Threatened Animals and Plants of Illinois. Endangered Species Protection Board, Springfield, Illinois. 16 pp.
- Edgin, B. & J.E. Ebinger. 2000. Vegetation of a successional prairie at Prairie Ridge State Natural Area, Jasper County, Illinois. *Castanea* 5:139-146.
- Iverson, L.R., G.L. Rolfe, T.J. Jacob, A.S. Hodgins & M.R. Jeffords. 1991. Forests of Illinois. Illinois Council on Forest Development, Urbana, and Illinois Natural History Survey, Champaign, Illinois.
- Kessler, A., G.C. Tucker & J.E. Ebinger. 2001. Prairie Restorations at Prairie Ridge State Natural Area, Jasper County, Illinois. *Transactions of the Illinois State Academy of Science* 94:127-138.

- McClain, W.E. 1986. Illinois Prairie: Past and Future. A Restoration Guide. Illinois Department of Conservation, Springfield, Illinois.
- McClain, W.E. 1997. Prairie Establishment and Landscaping. Illinois Department of Natural Resources, Springfield, Illinois. 62 pp.
- McFall, D., & J. Karnes (eds.). 1995. A Directory of Illinois Nature Preserves. Volume 2. Northwestern, central, and southern Illinois. Illinois Department of Natural Resources, Springfield, Illinois.
- McIntosh, R.P. 1957. The York Woods. A case history of forest succession in southern Wisconsin. *Ecology* 38:29–37.
- Midwestern Regional Climate Center. 2009. <http://mcc.sws.uiuc.edu>
- Mohlenbrock, R. 2002. Vascular Flora of Illinois. Southern Illinois University Press, Carbondale & Edwardsville, Illinois.
- Packard, S. & C.F. Mutel. 1997. The Tallgrass Restoration Handbook for Prairies, Savanna and Woodlands. Society for Ecological Restoration. Island Press, Washington, D.C. and Covelo, California. 463 pp.
- 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. 32 pp. + map.
- Simpson, S.A. 1998. Prairie Ridge State Natural Area: A grassland bird success story involving 40 years of cooperation among public agencies, private conservation organizations and dedicated individuals. *Illinois Audubon* 266:4–9.
- Simpson, S.A. & T.L. Esker. 1997. Prairie Ridge State Natural Area Habitat Plan. Illinois Department of Natural Resources, Division of Natural Heritage. vii + 80 pp.
- Suloway, L., M. Joselyn & P.W. Brown. 1996. Inventory of Resource Rich Areas in Illinois: An Evaluation of Ecological Resources. Illinois Natural History Survey. 167 pp.
- Taft, J.B., G.S. Wilhelm, D.M. Ladd & L.A. Masters. 1997. Floristic quality assessment for vegetation in Illinois, a method for assessing vegetation integrity. *Eriogenia* 15:1–95.
- Transeau, E.N. 1935. The prairie peninsula. *Ecology* 16:423–437.
- Tucker, G.C. 2001. *Scirpus sensu lato* (Cyperaceae) in Illinois: An update. *Transactions of the Illinois State Academy of Science* 94:53.
- Yatskievych, G. 2001. Steyermark's Flora of Missouri, vol.1, Monocotyledons. Missouri Department of Conservation. Missouri Botanical Garden, St. Louis. 991 pp.
- Willman, H.B., E. Atherton, J.C. Buschbach, C. Collinson, J.C. Frye, M.E. Hopkins, J.A. Lineback & J.A. Simon. 1975. Handbook of Illinois Stratigraphy. Illinois State Geological Survey Bulletin 95, Urbana, Illinois.

Manuscript received 26 March 2009, revised 15 July 2009.

APPENDIX I

Vascular plant species encountered at Prairie Ridge State Natural Area, Jasper County, Illinois are listed alphabetically by family under major plant groups. An asterisk (*) indicates non-native species. Collecting numbers are preceded by the initial of the collector (E = Bob Edgin; K = Annette Kessler; T = Gordon Tucker). Specimens are deposited in the Stover-Ebinger Herbarium, Eastern Illinois University, Charleston, Illinois (EIU), with some duplicates at the Illinois Natural History Survey Herbarium, Champaign, Illinois (ILLS). Nomenclature generally follows Mohlenbrock (2002).

FERNS AND FERN ALLIES

Aspleniaceae (Spleenwort Family)

Asplenium platyneuron (L.) Oakes, T14050

Dryopteridaceae (Shield Fern Family)

Cystopteris protrusa (Weatherby) Blasdell, T13973

Polystichum acrostichoides (Michx.) Schott, T14086

Equisetaceae (Horsetail Family)

Equisetum arvense L., T14144

Equisetum hyemale L., T15163

Onocleaceae (Sensitive Fern Family)

Onoclea sensibilis L., T14200

Ophioglossaceae (Adder's Tongue Family)

Botrychium dissectum Spreng. var. *dissectum*, T14552A

Botrychium dissectum Spreng. var. *obliquum* (Muhl.)

Clute, T14551

Botrychium virginianum (L.) Sw., T14021

Thelypteridaceae (Marsh Fern Family)

Phegopteris hexagonoptera (Michx.) Fée, T14085

GYMNOSPERMS

Cupressaceae (Cypress Family)

Juniperus virginiana L., T13932

DICOTYLEDONEAE

Acanthaceae (Acanthus Family)

Justicia americana (L.) Vahl, T14071

Ruellia humilis Nutt., K348, T13623

Aceraceae (Maple Family)

Acer × *freemanii* Murr., T14047, T15169

Acer negundo L., T14541, T14628

Acer rubrum L., T14041, T15170

Acer saccharinum L., T15168

Acer saccharum Marsh., T14878

Amaranthaceae (Pigweed Family)

Amaranthus rudis J. Sauer, T14432, T14425

Anacardiaceae (Sumac Family)

Rhus glabra L., K358

Toxicodendron radicans (L.) Kuntze, T12349

Apiaceae (Parsley Family)

Cicuta maculata L., T14129

Eryngium yuccifolium Michx., K365

**Pastinaca sativa* L., T13636

Sanicula canadensis L., T14128

Zizia aurea (L.) Koch, T13925

Apocynaceae (Ginseng Family)

Amsonia tabernaemontana Walt., T13995

Apocynum androsaemifolium L., T15441

Apocynum cannabinum L., E394, T12326

Araliaceae (Ginseng Family)

Panax quinquefolius L., T14135

Aristolochiaceae (Birthwort Family)

Aristolochia serpentaria L., T14082

Asarum canadense L., T14053

Asclepiadaceae (Milkweed Family)

Asclepias hirtella (Pennell) Woodson, K363

Asclepias incarnata L., K393

Asclepias purpurascens L., T14045, T14065

Asclepias syriaca L., K331

Asclepias tuberosa L., T14063

Asclepias verticillata L., K400

Asclepias viridiflora Raf., T14096

Asteraceae (Aster Family)

**Achillea millefolium* L., K222

Ambrosia artemisiifolia L., T12341

Ambrosia bidentata Michx., K418

Antennaria plantaginifolia (L.) Hook., T14861

**Anthemis cotula* L., T14656

Aster ericoides L., T14483

Aster laevis L., T14482

Aster lanceolatus Willd., T14529, T14501

Aster lateriflorus (L.) Britt., T14525

Aster novae-angliae L., T13870

Aster pilosus Willd., T14481

Aster turbinellus Lindl., T14535

Bidens aristosa (Michx.) Britt., T12369

Bidens bipinnata L., T14426

Bidens cernua L., T12362, T13860

Bidens frondosa L., T15162

Boltonia asteroides (L.) L'Hér., T13854, T12343

Cirsium discolor (Muhl.) Spreng., E475

Conoclinium coelestinum (L.) DC., T13852

Conyza canadensis (L.) Cronq., T12350

Coreopsis lanceolata L., T13990

Coreopsis palmata Nutt., K301

Coreopsis tripteris L., T14391

Echinacea purpurea (L.) Moench., T14512

Eclipta prostrata (L.) L., T13867

Erechtites hieracifolia (L.) Raf., T12337

Erigeron annuus (L.) Pers., K317

Erigeron philadelphicus L., T13973

Eupatoriadelphus fistulosus (Barratt) R.M. King & H. Robins., T14834

Eupatoriadelphus purpureus (L.) R.M. King & H. Robins., T14845

Eupatorium perfoliatum L., K412

Eupatorium serotinum Michx., T12334

Euthamia graminifolia (L.) Nutt., T12366

Euthamia gymnospermoides Greene, Jones 05-1

Helenium autumnale L., Cunningham 31

Helenium flexuosum Raf., T14134

Helianthus grosseserratus Martens, E536, T12345

Helianthus mollis Lam., K410

Helianthus pauciflorus Nutt., T14421

Helianthus strumosus L., Cunningham 33

Hieracium longipilum Torr., T14850

Krigia dandelion (L.) Nutt., T13974

Lactuca canadensis L., T12348

Lactuca floridana (L.) Gaertn., T14407

**Lactuca serriola* L., T12333

**Leucanthemum vulgare* Lam., K309

Liatris aspera Michx., T14386

Liatris pycnostachya Michx., E460, K381, T12328

Liatris squarrosa (L.) Michx., T14885

**Matricaria discoidea* DC., T14029

Oligoneuron rigidum (L.) Small, T12330

Parthenium integrifolium L., T14643

Pluchea camporata (L.) DC., T15165

Pseudognaphalium obtusifolium (L.) Hillard & Burt., K431

Rudbeckia hirta L., K289

Rudbeckia laciniata L., T14388

Senecio glabellus Poir., K209

Silphium integrifolium Michx., T14486

Silphium laciniatum L., T14472

Silphium perfoliatum L., T14431

Silphium terebinthinaceum Jacq., E448

Solidago canadensis L., E1065, T14415

Solidago juncea Ait., K416

Solidago nemoralis Ait., K419

Solidago ulmifolia Muhl., T14385

**Sonchus asper* (L.) Hill., K345

**Taraxacum officinale* Weber, T14498

**Tragopogon dubius* Scop., T14035

Verbesina alternifolia (L.) Britt., T14387
Verbesina helianthoides Michx., T14075
Vernonia missurica Raf., K401
Xanthium strumarium L., Cunningham 34

Balsaminaceae (Touch-me-not Family)

Impatiens capensis Meerb., T14875

Berberidaceae (Barberry Family)

Podophyllum peltatum L., T14091

Betulaceae (Birch Family)

Betula nigra L., T14522, T14855

Bignoniaceae (Bignonia Family)

Campsis radicans (L.) Seem., T14868

Boraginaceae (Borage Family)

Hackelia virginiana (L.) I.M. Johnston, T14831
Mertensia virginica (L.) Pers., T14625
Myosotis verna Nutt., K205, T13937, T13958

Brassicaceae (Mustard Family)

**Arabidopsis thaliana* (L.) Heynh., T13928
Arabis laevigata (Willd.) Poir., T14073
**Barbarea vulgaris* R. Br., K204
**Capsella bursa-pastoris* (L.) Medic., T13936
**Cardamine hirsuta* L., T14627
Cardamine parviflora L., K206, T13929
Dentaria laciniata Muhl., T13971, T14621
**Erophila verna* (L.) Chev., T14624
**Lepidium campestre* (L.) R. Br., T14060
**Lepidium densiflorum* Schrad., T13967
Rorippa sessiliflora (Nutt.) A. Hitchc., T15164
**Rorippa sylvestris* (L.) Besser, T13631
Sibara virginica (L.) Rollins, T13929
**Thlaspi arvense* L., T13938
**Thlaspi perfoliatum* L., T14623

Caesalpiniaceae (Caesalpinia Family)

Cercis canadensis L., T14630
Chamaecrista fasciculata (Michx.) Greene, K387
Gleditsia triacanthos L., T14007
Senna marilandica (L.) Link, T14392

Callitrichaceae (Water Starwort Family)

Callitriche terrestris Raf., T13962

Campanulaceae (Bellflower Family)

Campanulastrum americanum (L.) Small, T14209
Lobelia inflata L., T14411
Lobelia spicata Lam., K396
Triodanis perfoliata (L.) Nieuwl., K298

Cannabinaceae (Hemp Family)

Humulus lupulus L., T14858

Capparaceae (Caper Family)

Polanisia dodecandra (L.) DC., T14199

Caprifoliaceae (Honeysuckle Family)

**Lonicera japonica* Thunb., K254
**Lonicera maackii* (Rupr.) Maxim., T14881
Sambucus canadensis L., T14095
Symphoricarpos orbiculatus Moench, T12379
Viburnum prunifolium L., T14644

Caryophyllaceae (Pink Family)

**Dianthus armeria* L., K235
Paronychia canadensis (L.) Wood, T14655
Paronychia fastigiata (Raf.) Fern., T14870
Silene stellata (L.) Ait. f., T14138
**Stellaria graminea* L., T14057
**Stellaria media* (L.) Cyrillo, T14651

Celastraceae (Bittersweet Family)

Celastrus scandens L., T14539

Chenopodiaceae (Goosefoot Family)

**Chenopodium album* L., T15170C
**Chenopodium ambrosioides* L., T14849, T148669

Cistaceae (Rockrose Family)

Lechea tenuifolia Michx., T14090, T14869

Convolvulaceae (Morning Glory Family)

**Convolvulus arvensis* L., T14126
**Ipomoea hederacea* (L.) Jacq., T14496
Ipomoea lacunosa L., T14502

Cornaceae (Dogwood Family)

Cornus drummondii C.A. Mey., T14040
Cornus florida L., T14149

Corylaceae (Hazelnut Family)

Carpinus caroliniana Walt., T14521
Corylus americana Walt., T14854

Crassulaceae (Stonecrop Family)

**Sedum telephium* L., T13624

Ebenaceae (Persimmon Family)

Diospyros virginiana L., T12346

Elaeagnaceae (Oleaster Family)

**Elaeagnus umbellata* Thunb., T14863

Euphorbiaceae (Spurge Family)

Acalypha deamii (Weatherby) Ahles, T14852
Acalypha virginica L., K369, T14427, T14852,
T14490
Chamaesyce maculata (L.) Small, T13869, T14487
Chamaesyce nutans (Lag.) Small, T13699

Croton capitatus Michx., T14389
Croton monanthogynus Michx., T14389
Euphorbia corollata L., K437

Fabaceae (Bean Family)

Amorpha fruticosa L., T14058
Apios americana Medic., T14851
Baptisia alba (L.) Vent, K366
Desmodium paniculatum (L.) DC., K414
 **Kummerowia stipulacea* (Maxim.) Makino, T13853
Lespedeza capitata Michx., E463, T14417
Lespedeza virginica (L.) Britt., T14420
 **Medicago lupulina* L., T14097
 **Medicago sativa* L., T13849
 **Melilotus albus* Medic., K300
 **Melilotus officinalis* (L.) Pallas, T14883
 **Securigera varia* (L.) Lassen, T14139
Strophostyles leiosperma (Torr. & A. Gray) Piper, K436, T14542
 **Trifolium campestre* Schreb., T13982, T14650
 **Trifolium hybridum* L., K376, T14036
 **Trifolium pratense* L., K311
 **Trifolium repens* L., T14074

Fagaceae (Beech Family)

Quercus bicolor Willd., T14856
Quercus imbricaria Michx., T15435
Quercus × *leana* Nutt., T14207
Quercus marilandica Muench., T14880
Quercus muhlenbergii Engelm., T14857
Quercus palustris Muench., T15170A
Quercus rubra L., T14864
Quercus stellata Wangh., T14532
Quercus velutina Lam., T14860, T14862

Gentianaceae (Gentian Family)

Frasera carolinensis Walt., T14647
Sabatia angulatus (L.) Pursh, T14841

Geraniaceae (Geranium Family)

Geranium carolinianum L., T14031
Geranium maculatum L., T14019

Grossulariaceae (Gooseberry Family)

Ribes missouriense Nutt., T14048

Hydrangeaceae (Hydrangea Family)

Hydrangea arborescens L., T14860

Hydrophyllaceae (Waterleaf Family)

Ellisia nyctelea L., T14652
Hydrophyllum virginianum L., T14059

Hypericaceae (St. John's Wort Family)

Hypericum drummondii (Grev. & Hook.) Torr. & A. Gray, K343, T14877
Hypericum mutilum L., T14531

**Hypericum perforatum* L., K292, K302
Hypericum punctatum Lam., K307, K330
Hypericum sphaerocarpum Michx., T14092

Juglandaceae (Walnut Family)

Carya cordiformis (Wangenh.) K. Koch, T14856
Carya glabra (Mill.) Sweet, T14210, T14384
Carya ovata (Mill.) K. Koch, T14202
Carya tomentosa (Poir.) Nutt., T14646
Juglans nigra L., T14830

Lamiaceae (Mint Family)

Blephilia ciliata (L.) Bernh., T14079
Hedeoma pulegioides (L.) Pers., T14871
 **Leonurus cardiaca* L., T14033
Lycopus americanus Muhlb., T14836
Lycopus virginicus L., T14548
Monarda bradburiana Beck, T14013
Monarda fistulosa L., K380
Physostegia virginiana (L.) Benth., T14437
Prunella vulgaris L., K389
Pycnanthemum pilosum Nutt., T14872
Pycnanthemum tenuifolium Schrad., K318, T13641
Pycnanthemum virginianum (L.) Dur. & B.D. Jacks., T14485
Scutellaria incana Biehler, T14148
Stachys aspera Michx., T14413
Stachys tenuifolia Willd., T14140
Teucrium canadense L., K367, T13639

Lauraceae (Laurel Family)

Lindera benzoin (L.) Blume, T14629
Sassafras albidum (Nutt.) Nees, obs.

Linaceae (Flax Family)

Linum medium (Planch.) Britt., K403, T12344

Lythraceae (Loosestrife Family)

Ammannia coccinea Rottb., T14534
Lythrum alatum Pursh, T13645

Malvaceae (Mallow Family)

**Abutilon theophrasti* Medic., T14433, T14499
Hibiscus laevis All., T13851
Hibiscus moscheutos L., T14500
 **Sida spinosa* L., T14495

Menispermaceae (Moonseed Family)

Menispermum canadense L., T15444

Mimosaceae (Mimosa Family)

Desmanthus illinoensis (Michx.) MacM., K347

Molluginaceae (Carpetweed Family)

**Mollugo verticillata* L., T12335

Moraceae (Mulberry Family)

**Maclura pomifera* (Raf.) Schneider, T14006
 **Morus alba* L., T13968, T14151
Morus rubra L., T14527

Nelumbonaceae (Lotus Family)

Nelumbo lutea (Willd.) Pers., T14550

Nyctaginaceae (Four o'Clock Family)

Mirabilis nyctaginea (Michx.) MacM., T14653

Oleaceae (Olive Family)

Fraxinus americana L., T14528
Fraxinus lanceolata Borkh., T14130
Fraxinus pennsylvanica Marsh., T14046

Onagraceae (Evening Primrose Family)

Circaea lutetiana L., T14066
Epilobium coloratum Spreng., T12336
Gaura biennis L., K406
Ludwigia alternifolia L., K368
Ludwigia palustris (L.) Ell., T14436
Ludwigia peploides (H.B.K.) Raven, T14435
Oenothera biennis L., K386, E1064

Oxalidaceae (Sorrel Family)

Oxalis stricta L., K210, T12339
Oxalis violacea L., K220

Papaveraceae (Poppy Family)

Sanguinaria canadensis L., obs.

Passifloraceae (Passion Flower Family)

Passiflora lutea L., T14210

Phrymaceae (Lopseed Family)

Phryma leptostachya L., T14155

Phytolaccaceae (Pokeweed Family)

Phytolacca americana L., T15461

Plantaginaceae (Plantain Family)

Plantago aristata Michx., T13646
 **Plantago lanceolata* L., K316
Plantago pusilla Nutt., T15449
Plantago rugelii Decne., T14198
Plantago virginica L., K261, T14067

Platanaceae (Sycamore Family)

Platanus occidentalis L., T15443

Polygalaceae (Milkwort Family)

Polygala sanguinea L., K325, T14064
Polygala verticillata L., K314

Polygonaceae (Smartweed Family)

Antenoron virginianum (L.) Roberty & Vauties, T14414

**Persicaria cespitosa* (Blume) Nakai, T14157
Persicaria lapathifolia (L.) S.F. Gray, E529
Persicaria pensylvanica (L.) Small, K407, E530
Persicaria punctata (Ell.) Small, T12333, T14430
 **Persicaria vulgaris* Webb. & Mog., T13864
 **Polygonum aviculare* L., T14853
Polygonum tenue Michx., T12353
 **Rumex acetosella* L. E358, T13985
 **Rumex crispus* L., K247
Rumex triangulivalis (Danser) Rech. f., E434

Portulacaceae (Purslane Family)

Claytonia virginica L., K207

Primulaceae (Primrose Family)

**Anagallis arvensis* L., E6123
Dodecatheon meadia L., T13927
Lysimachia lanceolata Walt., T14203
 **Lysimachia nummularia* L., T14866

Ranunculaceae (Buttercup Family)

Anemone virginiana L., T14859
Hydrastis canadensis L., T14015
Myosurus minimus L., T13926
Ranunculus abortivus L., T13933
Ranunculus sceleratus L., T13963
Thalictrum dasycarpum Fisch. & Lall., T14008

Rosaceae (Rose Family)

Agrimonia parviflora Sol., T14840
Agrimonia pubescens Wallr., T14879
Crataegus crus-galli L., T13965
Crataegus pruinosa (Wendl.) K. Koch, T15442
Fragaria virginiana Duchesne, K221
Geum canadense Jacq., T14094
Geum laciniatum Murr., T13644
Geum vernum (Raf.) Torr. & Gray, T14022, T14645
Malus ioensis (Wood) Britt., T12347
 **Malus pumila* Mill., T15446
Porteranthus stipulatus (Muhl.) Britt., T14039
 **Potentilla recta* L., K291
Potentilla simplex Michx., K219, T14865
Prunus hortulana Bailey, T14054
 **Prunus persica* (L.) Batsch, T14632
Prunus serotina Ehrh., T15440A
Rosa blanda Ait., T14410
 **Rosa canina* L., T14049
Rosa carolina L., T13989
 **Rosa multiflora* Thunb., T13934
Rosa setigera Michx., T14068
Rosa suffulta Greene, K357
Rubus allegheniensis Porter, T13981
Rubus flagellaris Willd., K214, T14137
Rubus occidentalis L., T14536
Rubus pensilvanicus Poir., T13960, T14017

Rubiaceae (Madder Family)

Cephalanthus occidentalis L., T14540

Diodia teres Walt., T14424
Galium aparine L., K211, T13986
Galium circaeazans Michx., T14072
Galium concinnum Torr. & Gray, T14078
Galium obtusum Bigel., K225, T14867
 **Galium pedemontanum* (Bellardi) All., T13626
Galium tinctorium L., T13850

Salicaceae (Willow Family)

Populus deltoides Marsh., E522
Salix humilis Marsh., E387, T14205
Salix interior Rowlee, T14884
Salix nigra Marsh., E487

Santalaceae (Sandalwood Family)

Comandra umbellata (L.) Nutt., T14077

Saururaceae (Lizard's-Tail Family)

Saururus cernuus L., T14080

Saxifragaceae (Saxifrage Family)

Penthorum sedoides L., T14147

Scrophulariaceae (Figwort Family)

Agalinis purpurea (L.) Pennell, T12340
Gratiola neglecta Torr., K255
Lindernia dubia (L.) Pennell, T12325
Mimulus ringens L., K392
Penstemon digitalis Nutt., K229, T14089
Penstemon pallidus Small, K236
Penstemon tubaeformis Nutt., E6125
Scrophularia marilandica L., T14874
 **Verbascum blattaria* L., T14127
 **Verbascum thapsus* L., obs.
 **Veronica arvensis* L., T13942
Veronica peregrina L., T13939

Solanaceae (Nightshade Family)

**Datura stramonium* L., T14847
Physalis heterophylla Nees, T13625
Physalis pubescens L., T14493
Solanum carolinense L., K362, T13863

Staphyleaceae (Bladdernut Family)

Staphylea trifolia L., T14084

Ulmaceae (Elm Family)

Celtis occidentalis L., T14027
Ulmus americana L., T13955
Ulmus rubra Muhl., T14150

Urticaceae (Nettle Family)

Boehmeria cylindrica (L.) Sw., T14842
Laportea canadensis (L.) Wedd., T15448
Parietaria pensylvanica Muhl., T14020
Pilea pumila (L.) Gray, T14530

Valerianaceae (Valerian Family)

Valerianella radiata (L.) DuRoi., T1394, T14640

Verbenaceae (Vervain Family)

Verbena bracteata Lag. & Rodr., T13930
Verbena hastata L., K332, T14837
Verbena stricta L., T14511
Verbena urticifolia L., T14848, T15156

Violaceae (Violet Family)

Viola pratincola Greene, E315
Viola pubescens Ait., T14026
 **Viola rafinesquii* Greene, T14648

Vitaceae (Grape Family)

Parthenocissus quinquefolia (L.) Planch., T14882
Vitis aestivalis Michx., T14031
Vitis riparia Michx., T15440
Vitis vulpina L., T14030

MONOCOTYLEDONEAE

Acoraceae (Sweet Flag Family)

**Acorus calamus* L., T13988

Agavaceae (Agave Family)

**Yucca smalliana* Fern., T12377

Alismataceae (Water-Plantain Family)

Alisma subcordatum Raf., T14839
Sagittaria calycina Engelm., T14145

Amaryllidaceae (Amaryllis Family)

**Narcissus poeticus* L., T13924

Araceae (Arum Family)

Arisaema dracontium (L.) Schott, T14009
Arisaema triphyllum (L.) Schott, T13972

Commelinaceae (Dayflower Family)

**Commelina communis* L., T14156
Tradescantia ohioensis Raf., T14002
Tradescantia virginiana L., K371

Cyperaceae (Sedge Family)

Carex amphibola Steud., T14087
Carex brachyglossa Mack., K224, K297
Carex blanda Dewey, K242, T13970
Carex bushii Mack., K216, K249, T13987
Carex cephalophora Muhl., K245
Carex cristatella Britt., K296
Carex festucacea Schk., T13961
Carex frankii Kunth, T13632
Carex granularis Muhl., T14011
Carex grayi Carey, T13998
Carex hirtifolia Mack., T13975
Carex lupulina Willd., T14146

Carex lurida Wahl., T14001
Carex missouriensis P. Rothr. & Reznicek, T14000
Carex muskingumensis Schwein., T14549
Carex pellita Willd., T13969
Carex pennsylvanica Lam., T15437
Carex radiata (Wahl.) Small, T13977
Carex scoparia Schk., K275
Carex shortiana Dewey, T13996
Carex sparganioides Muhl., T14056
Carex squarrosa L., T13638
Carex typhina Michx., T14037
Carex vulpinoidea Michx., K285, T14838
Cyperus acuminatus Torr. & Hook., T13868
Cyperus echinatus (L.) A. Wood, K338
Cyperus erythrorhizos Muhl., T14544
Cyperus esculentus L. var. *leptostachyus* Boeck., K312, T13858
Cyperus odoratus L., T12322, T13865
Cyperus squarrosus L., T15167
Cyperus strigosus L., K355
Eleocharis acicularis (L.) Roem. & Schultes, T14142
Eleocharis intermedia (Muhl.) Schultes, T14543
Eleocharis ovata (Roth) Roem. & Schultes, T13859, T12365
Eleocharis palustris (L.) Roem. & Schultes, T13856
Eleocharis verrucosa (Svenson) Harms, K215
Fimbristylis autumnalis (L.) Roem. & Schultes, T12320
Schoenoplectus americanus (Pers.) Volk. ex Schinz. & R. Keller, T12363
**Schoenoplectus mucronatus* (L.) Palla, T12321
Schoenoplectus pungens (Vahl) Palla, T12364, T14143
Schoenoplectus purshianus (Fern.) M.T. Strong, T12375
Schoenoplectus tabernaemontani (K.C. Gmel.) Palla, T13862
Scirpus cyperinus (L.) Kunth, T14505
Scirpus georgianus Harper, K238, T13642
Scirpus pendulus Muhl., T13999

Dioscoreaceae (Yam Family)

Dioscorea quaternata (Walt.) J.F. Gmel., T14523

Iridaceae (Iris Family)

**Iris* × *germanica* L., T13983
**Iris pseudacorus* L., T13994
Iris shrevei Small, T13993
Sisyrinchium albidum Raf., K308

Juncaceae (Rush Family)

Juncus acuminatus Michx., T13700
Juncus biflorus Ell., K359, T12352
Juncus brachycarpus Engelm., E416
Juncus interior Wieg., K240

Lemnaceae (Duckweed Family)

Lemna minor L., T14508

Liliaceae (Lily Family)

Allium canadense L., T13980
**Allium sativum* L., T14133
**Allium vineale* L., T14032.
**Asparagus officinalis* L., T13984
Camassia scilloides (Raf.) Cory, K218
Erythronium albidum Nutt., T14622
**Hemerocallis fulva* (L.) L., T15436
**Muscari botryoides* (L.) Mill., T14626
**Ornithogalum umbellatum* L., T13923
Smilacina racemosa (L.) Desf., T14014
Trillium recurvatum Beck, T13979, T14620
Typha angustifolia (L.) , T15466
Typha latifolia L., T14544
Uvularia grandiflora Sm., T14083

Orchidaceae (Orchid Family)

Aplectrum hyemale (Muhl. ex Nutt.) Willd., 15463
Liparis liliifolia (L.) Rich., T14069
Platanthera peramoena (A. Gray) A. Gray, photo
Spiranthes cernua (L.) Rich., T14546

Poaceae (Grass Family)

**Agrostis gigantea* Roth, T13629, T13640
Agrostis hyemalis (Walt.) BSP., T14052
Alopecurus carolinianus Walt., K212
Andropogon gerardii Vitman, E473
Andropogon virginicus L., T14419
Aristida longespica Poir., K428
**Bothriochloa laguroides* (DC.) Herter, T14484
Bouteloua curtipendula (Michx.) Torr., T14480
Brachyelytrum erectum (Roth) P. Beauv., T14152
**Bromus commutatus* Schrad., K266, T13628
**Bromus inermis* Leyss., T14876
**Bromus japonicus* Thunb., T13991
Bromus pubescens Muhl., T14018, T14153
**Bromus tectorum* L., T14005
Buchloe dactyloides (Nutt.) Engelm., T14494, T14641
Cenchrus longispinus (Hasck.) Fern., T14504
Chasmanthium latifolium (Michx.) Yates, T14204
Cinna arundinacea L., Marti 65
Danthonia spicata (L.) Roem. & Schultes, T14043
Dichanthelium acuminatum (Sw.) Gould & Clark, K434, T14055
Dichanthelium boscii (Poir.) Gould & Clark, T14025, T14154
Dichanthelium clandestinum (L.) Gould, T14846
Dichanthelium oligosanthes (Schult.) Gould, T14093
**Digitaria ischaemum* (Schreb.) Schreb., T15158, T14488
**Digitaria sanguinalis* (L.) Scop., T14428, T14489, T151259
**Echinochloa crus-galli* (L.) P. Beauv., K409
Echinochloa muricata (Beauv.) Fernald, Craven 30
**Eleusine indica* (L.) Gaertn., T14533
Elymus canadensis L., T12329
Elymus × *ebingeri* G.C. Tucker, T14873
Elymus canadensis × *E. hystrix*, T14076

Elymus hystrix L., T14076
Elymus villosus Muhl., T14070
Elymus virginicus L., T12351
 **Elytrigia repens* (L.) Desv., T14132
 **Eragrostis cilianensis* (All.) Vign., T14197
Eragrostis hypnoides (Lam.) BSP., Cunningham 25
Eragrostis pectinacea (Michx.) Nees, T14408
 **Festuca arundinacea* Schreb., K241
 **Festuca pratensis* Huds., K258
Festuca subverticillata (Pers.) E.B. Alexeev, T13978,
 T14658
Glyceria striata (Lam.) Hitchc., T13637
Hordeum jubatum L., T14003
Hordeum pusillum Nutt., T13957
Leersia oryzoides (L.) Swartz, T14503
Leersia virginica Willd., T14524
 **Leptochloa acuminata* (Nash) Mohlenbr., T14418
Muhlenbergia frondosa (Poir.) Fernald, T14526
Muhlenbergia glabriflora Scribn., T12378
Muhlenbergia schreberi J.F. Gmel., T14412
Panicum capillare L., K396
Panicum dichotomiflorum Michx., T14492
Panicum rigidulum Bosc, T14835
Panicum virgatum L., K397
Paspalum laeve Michx., K425
Paspalum setaceum Michx., K429
 **Phalaris arundinacea* L., T13992
 **Phleum pratense* L., K335
 **Phragmites australis* (Cav.) Trin., obs.
 **Poa annua* L., T13931, T14016

Poa chapmaniana Scribn., T14639
 **Poa compressa* L., K239, T13630
Poa palustris L., T14061
 **Poa pratensis* L., T13943
Poa sylvestris Gray, T14012, T14657
 **Poa trivialis* L., T14107
Schizachyrium scoparium (Michx.) Nash, K440
 **Sclerochloa dura* (L.) P. Beauv., T14028
 **Setaria faberi* F. Herrm., K426, T14843
Setaria glauca (L.) P. Beauv., T14491
Sorghastrum nutans (L.) Nash, K408
Spartina pectinata Link, T14887
Sporobolus neglectus Nash, T14422
Tridens flavus (L.) Hitchc., T14538
Tripsacum dactyloides (L.) L., T14438
Vulpia octoflora (Walt.) Rydb., T14044, T14649

Potamogetonaceae (Pondweed Family)

Potamogeton foliosus Raf., T14507
Potamogeton nodosus Poir., T12376, T14506

Smilacaceae (Catbrier Family)

Smilax lasioneuron Hook., T15445
Smilax tannoides L., T14537

Typhaceae (Cat-tail Family)

Typha angustifolia L., T15466
 **Typha domingensis* Pers., T13861
Typha latifolia L., T15454