

Botanical Survey of Wildcat Hollow State Forest, Effingham County, Illinois

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ABSTRACT

Wildcat Hollow State Forest is a 283 ha tract that contains a number of plant communities including: dry-mesic upland forest, wet-mesic floodplain forest, cliff communities, a successional field, prairie reconstructions, and artificial ponds. We quantitatively sampled upland dry-mesic forest communities. The forest was dominated by oaks and hickories with *Quercus alba* (white oak), *Q. velutina* (black oak), *Carya ovata* (shagbark hickory), and *C. tomentosa* (mockernut hickory) the dominant species. The woody understory was dominated by shagbark hickory and *Ulmus rubra* (slippery elm), which accounted for nearly one-third of the 15,167 seedlings/ha. Other mesic tree species were common understory species, but were not important overstory components. A vouchered inventory included 518 species, of which 15 were ferns and fern-allies, 2 gymnosperms, 360 dicots, and 141 monocots. Exotic species were represented by 90 taxa, 17.3 % of the flora.

Key Words: dry-mesic upland forest, Illinois, *Quercus*, *Carya*, *Ulmus*.

INTRODUCTION

Since the settlement of the Midwest in the early 1800's, most of the oak-hickory dominated forests of the region have been undergoing extensive changes in species composition and structure. Soon after settlement by Europeans, periodic fires all but ceased (McClain and Elzinga 1994). The reduction in fire frequency in these forests has completely altered the flora of many forests, woodlands, and savannas. Savanna and woodlands became closed-canopy forests, while the closed-canopy forests became more mesic. Overall, this resulted in an increase in shade-tolerant, fire-sensitive tree species, a decrease in oak regeneration, a subtle change in understory plant species, and a corresponding loss in the wildlife depending on these species (Abrams 1992, 2005, Anderson 1991, Ebinger 1986, 1997, Ebinger and McClain 1991).

In many Illinois forests, *Acer saccharum* (sugar maple) has increased in importance in the oak-hickory forests and savannas (Curtis 1959, Abrams 1992, 2005). These changes have been accelerating during the past 50 to 75 years. If this trend continues, many of the oak-hickory forests, their understories, and the wildlife that depends upon them will be in serious trouble. Many of the best quality oak-hickory communities are undergoing an

irreversible change as sugar maple and other mesic, shade-tolerant, fire-sensitive species replace the original forest components.

Some dry to dry-mesic upland forests in Illinois, however, have maintained much of their original woody composition, with various species of oaks and hickories maintaining their dominance. Also, in some of these forests mesic species do not dominate the understory, and some oak regeneration occurs. Many of these oak-hickory forests, which still contain some of their pre-settlement character, are located on the Illinoian till plain in central Illinois. Some are barrens communities (Taft and Solecki 2002, Taft 2003, Edgin et al. 2004); others are flatwoods communities (Taft et al. 1995, Edgin et al. 2003), while others are upland dry to dry-mesic forests (Ebinger 1982, Ebinger and Newman 1984, Feist et al. 2004). The purpose of our study was to quantitatively sample the vegetation of the dry-mesic upland forest at Wildcat Hollow State Forest, and compare the results to other forest communities in east-central Illinois. Also a vouchered inventory of the vascular plant species was completed.

DESCRIPTION OF THE STUDY AREA

Wildcat Hollow State Forest is a 283 ha tract located in Effingham County, Illinois, about 3 miles north of Mason (S2, 3, 11 T6N, R5E; 38°59'10"N 88°36'30"W). An initial holding of 113 ha was transferred from the Illinois Department of Transportation to the Illinois Department of Natural Resources in 1972. Since that time, additional acquisitions have increased the extent of the state forest to its current size. Wildcat Hollow contains a number of natural and anthropogenic communities including dry-mesic upland forest, mesic upland forest, wet-mesic floodplain forest, successional old-fields, prairie reconstructions, sandstone cliffs and springs communities, a pine plantation, and artificial ponds.

Located at an elevation of about 180 m above sea level on Illinoian till, Wildcat Hollow is about 40 km S of the terminal moraine of Wisconsin glaciation, in the Effingham Section of the Southern Till Plain Natural Division (Schwegman 1973). The pre-settlement vegetation of most of the more level uplands of this division was dry to wet, tallgrass prairie, while in the dissected stream valleys and hilly morainal areas, the vegetation was dominated by savanna, woodland, and forest (Anderson 1991; Ebinger and McClain 1991).

The east/west oriented Fulfer Creek is near the northern edge of Wildcat Hollow. The north/south oriented ravines feed into Fulfer Creek with the largest being about 15 m deep and 65-75 m wide. These steep-sided ravines support a mesic forest of sugar maple, *Fraxinus americana* (white ash), and *Platanus occidentalis* (sycamore), the largest trees about 75 cm dbh. The steep slopes of these ravines support *Polystichum acrostichoides* (Christmas fern) in abundance, and the nearly vertical sandstone cliffs contain *Asplenium rhizophyllum* (walking fern) and *Cystopteris bulbifera* (bladder fern).

Most of the flat uplands of the preserve were cultivated in the past. Two small fields are now prairie reconstructions, each between 1 and 2 ha in size, the others successional old-fields. Based on soil characteristics, one of the old fields may have originally been a *Quercus palustris* (pin oak) flatwoods. Much of the remaining upland, particularly in

areas where there is some topographic relief, mature second growth dry to mesic upland forest dominates.

The soils of the upland at Wildcat Hollow are classified as Bluford and Ava silt loam (Awalt 1991). These soils are highly eroded with little of the original A horizon present, are well drained, low in organic content, and slightly acid. The soils of the steep slopes are hickory silt loam, with extensive soil slumping and exposed clayey subsoil. Loess deposits originally covered these soils but have been eroded away (Leeper and Gotsch 1998).

Based on weather records from 1971-2000 at Effingham (Effingham County Memorial Airport, 14 km to the NNE), annual precipitation averaged 97.5 cm, with July having the highest rainfall (11.4 cm). Mean annual temperature was 11.6° C, the hottest month being July (average of 24.6° C), the coldest being January (average of -3.2° C). The average number of frost-free days was 186 (Midwestern Regional Climate Center 2005).

Few previous botanical studies have been completely in this state forest. Illinois Natural History Survey botanist, Dr. Robert Evers, visited the site and collected 90 species (6 June 1967). In 1979 members of the Illinois Natural Areas Inventory reported 74 vascular plant species with 64 being woody (White 1979). No quantitative data were collected and the survey apparently did not include the sandstone cliffs or ravines.

MATERIAL AND METHODS

A list of vascular plant species occurring within the boundaries of the state forest was completed and voucher specimens collected (Appendix I). Specimens have been deposited in the Stover-Ebinger Herbarium at Eastern Illinois University (EIU) with numerous duplicates at the Illinois Natural History Survey (ILLS) and the Missouri Botanical Garden (MO). Nomenclature follows Mohlenbrock (2002). Bob Edgin collected on the site in 2000 and 2001, while during the 2003 through 2006 field seasons Gordon Tucker visited the area, sometimes in company with John Ebinger, students from Eastern Illinois University, and personnel from the Illinois Department of Natural Resources. Specimens were collected every 3-4 weeks throughout the growing season. The 1967 collections by Robert Evers (ILLS) were examined and included in the vouchered list.

In the summer of 2005 the overstory of the mature second growth dry-mesic upland forest was sampled using 0.03 ha circular plots established at 30 m intervals along two north/south transects (30 plots). In each plot all living individuals ≥ 10.0 cm dbh were identified and their diameters recorded (Table 1). Living-stem density (stems/ha), basal area (m^2/ha), relative density, relative dominance (basal area), importance value (IV), and average diameter (cm) were calculated for each species. Determination of IV follows McIntosh (1957) and is the sum of the relative density and relative dominance. The woody understory composition and density (stems/ha) were determined using nested circular plots 0.0001, 0.001, and 0.01 ha in size located at each center point of the overstory plot (Table 2). Four additional 0.0001 ha circular plots were located 7 m from the center points of each plot center along cardinal compass directions. In the 0.0001 ha plots, woody seedlings and shrubs (≤ 50 cm tall) were counted; in the 0.001 ha circular plots

small saplings and shrubs (>50 cm tall and <2.5 cm dbh) were recorded; and in the 0.01 ha circular plots large saplings and shrubs (2.5-9.9 cm dbh) were tallied.

RESULTS

A total of 518 species within 316 genera and 108 families was documented for Wildcat Hollow. Of these, 15 were ferns and fern-allies, 2 gymnosperms, 360 dicots in 239 genera and 85 families, and 141 monocots in 63 genera and 13 families (Appendix I). Exotic species were represented by 90 taxa, 17.3 % of the flora. No endangered or threatened species were encountered (Herkert and Ebinger 2002). The predominant plant families were Poaceae (69 species), Asteraceae (73), Cyperaceae (33), Fabaceae (33), and Rosaceae (27). Of the 90 species collected by Dr. Robert Evers, we located and re-collected 76.

In the forest survey of the dry-mesic upland forest 26 woody species were encountered in the overstory and understory plots, of which seven were understory trees and shrubs. Tree density averaged 291 stems/ha, while total basal area averaged 29.127 m²/ha (Table 1). *Quercus alba* (white oak) dominated the overstory with an IV of 88.8, accounted for nearly half of the total basal area, dominated the larger diameter classes, and averaged 37.8 cm dbh. Second in IV, *Quercus velutina* (black oak), accounted for one-third of the basal area (8.138 m²/ha), was common in the larger diameter classes, and averaged 44.2 cm dbh. Two species of hickory, *Carya ovata* (shagbark hickory), and *C. tomentosa* (mockernut hickory), were third and fourth in IV respectively (IV of 25.4 and 25.2). All other species encountered had IVs of 3 or lower, and were minor overstory components.

The woody understory seedling layer was dominated by various species of oaks and hickories, and along with *Ulmus rubra* (slippery elm) and *Sassafras albidum* (sassafras), accounted for more than one-third of the 15,166 seedlings/ha (Table 2). Though not recorded in the overstory, *Ulmus rubra* was second in seedlings and common in the sapling layers where it accounted for nearly 500 stems/ha, the majority being root-sprouts (Davis et al. 1997). Overall, oaks were common in the seedling layer (3416 stems/ha), but relatively few individuals were present in the sapling layers (215 stems/ha). Hickories, in contrast, were well represented in the seedling layer (3800 stems/ha), and relatively common in the sapling layers (1158 stems/ha). Mesic species, such as white ash and sugar maple, were found in the seedling and sapling layers but were absent, or poorly represented in the overstory (Table 1).

DISCUSSION

The dry-mesic upland forest at Wildcat Hollow is probably similar in species composition to forests of early settlement times. In the prairie peninsula (Transeau 1935) of the early 1800s, oak-hickory savanna, woodland, and forest covered about 40% of the land surface (Ebinger and McClain 1991, Anderson 1991). Topographic relief and the intensity and frequency of fires were important in controlling the pre-settlement distribution of these forests. Usually prairie vegetation was on flat to gently sloping ground; savanna, woodland, and forest were mostly in dissected area, or on the uplands to the east and south of dissected lands (Gleason 1913). This segregation occurred because dissected landscapes do not readily carry fire since well-developed drainage systems with perma-

ment streams are excellent firebreaks. In addition, fires in hilly areas tend to move up slope relatively rapidly due to rising convection air currents, but convection currents work against fires when they move down hill, not uncommonly causing it to burn out (Anderson 1991).

With the cessation of fires most of the oak savannas, woodlands, and forests have become closed forests that are more mesic than in early settlement times (Curtis 1959, Anderson 1983, Ebinger and McClain 1991). Presently, this change has not occurred at Wildcat Hollow, and a few similar forests on the Illinoian till plain in east-central Illinois (Table 3). Though the canopies of these forests are probably more closed than their pre-settlement counterparts, the dominant species of the overstory of these present-day forests are still oaks and hickories and some oak and hickory reproduction is presently taking place.

Dry to dry-mesic upland forests at Wildcat Hollow, as well as at other forests on Illinoian till located near Wildcat Hollow in east-central Illinois have similar structures, and show similar successional trends. Toledo Woods (Ebinger and Newman 1984), Rock Cave Nature Preserve (Ebinger 1982), and Dean Hills Nature Preserve (Feist et al. 2004), all within 50 km of Wildcat Hollow, were dominated by oaks and hickories (Table 3). Also, oak and hickory seedlings were common in the understory, and sapling and smaller diameter oaks and hickories were common. In these woods more mesic species were entering the understory, and sometimes the canopy (Table 3). On very dry sites, like those in the uplands of Rock Cave Nature Preserve, mesic species were rare, and oaks and hickories were the only species present, dominating the smaller diameter classes (Ebinger 1982). More commonly, however, some mesic species (maples, elms, and ashes) were important understory species and were occasionally entering the overstory. With time, the overstories of these forests will be similar to the mesic upland forests presently found at Rock Cave and Dean Hills Nature Preserves, where sugar maple has become the dominant overstory species (Table 3). Only with proper management will the oak-hickory forest similar to those of pre-settlement times be maintained. This will mostly involve the regular use of management fires along with some cutting to maintain an open canopy so that oak reproduction will increase.

There is very little published data on the composition of prairie reconstructions on Illinoian till in east-central Illinois. Investigations by Kessler et al. (2001) at Prairie Ridge State Natural Area, some 50 km to the east in Jasper County, reported the dominant species as *Solidago canadensis*, *Sorghastrum nutans* (Indian grass), *Andropogon gerardii* (big bluestem), and *Schizachyrium scoparium* (little bluestem). This composition is similar to the successional old-field and prairie reconstructions at Wildcat Hollow. In the prairie reconstructions at Wildcat Hollow *Solidago canadensis* (Canada goldenrod) was the most obvious species in late summer. Indian grass and big bluestem, and little bluestem were the next most obvious taxa. Other common prairie species including *Solidago nemoralis* (gray goldenrod), *Fragaria virginiana* (wild strawberry), *Desmanthus illinoensis* (bundleflower), and *Pycnanthemum tenuifolium* (slender mountain mint). Along with Canada goldenrod, the Eurasian, cool-season grasses were important components of the successional old-field with *Phleum pratense* (timothy), *Bromus inermis* (awnless brome), and *Poa pratensis* (Kentucky bluegrass) being the most common.

ACKNOWLEDGMENTS

We thank Tony Reznicek (MICH) for checking identifications of *Carex*, the Illinois Department of Natural Resources for providing financial support through the Illinois Wildlife Preservation Fund, and Rick Phillippe, Illinois Natural History Survey, for providing the list of specimens collected by Robert Evers.

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Table 1. 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 the upland forest at Wildcat Hollow State Forest, Effingham 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> | 12.2 | 23.3 | 32.2 | 23.3 | 21.1 | 112.1 | 14.711 | 38.3 | 50.5 | 88.8 | 37.8 |
| <i>Quercus velutina</i> | -- | 3.3 | 11.1 | 24.4 | 12.2 | 51.0 | 8.138 | 17.5 | 27.9 | 45.4 | 44.2 |
| <i>Carya ovata</i> | 14.4 | 14.4 | 10.0 | 6.7 | -- | 45.5 | 2.864 | 15.6 | 9.8 | 25.4 | 25.2 |
| <i>Carya tomentosa</i> | 24.4 | 24.4 | 1.1 | 2.2 | -- | 52.1 | 2.132 | 17.9 | 7.3 | 25.2 | 21.4 |
| <i>Quercus rubra</i> | -- | 1.1 | 1.1 | 2.2 | -- | 4.4 | 0.458 | 1.5 | 1.6 | 3.1 | 35.8 |
| <i>Prunus serotina</i> | 4.4 | 2.2 | -- | -- | -- | 6.6 | 0.191 | 2.3 | 0.7 | 3.0 | 18.5 |
| <i>Cornus florida</i> | 6.7 | -- | -- | -- | -- | 6.7 | 0.072 | 2.3 | 0.3 | 2.6 | 11.8 |
| <i>Sassafras albidum</i> | 5.6 | -- | -- | -- | -- | 5.6 | 0.067 | 1.9 | 0.2 | 2.1 | 12.2 |
| <i>Acer saccharum</i> | 1.1 | -- | 2.2 | -- | -- | 3.3 | 0.188 | 1.1 | 0.7 | 1.8 | 25.6 |
| <i>Quercus stellata</i> | -- | -- | -- | 1.1 | -- | 1.1 | 0.210 | 0.4 | 0.7 | 1.1 | 49.0 |
| <i>Carya glabra</i> | -- | 1.1 | -- | -- | -- | 1.1 | 0.038 | 0.4 | 0.1 | 0.5 | 20.9 |
| <i>Morus rubra</i> | 1.1 | -- | -- | -- | -- | 1.1 | 0.020 | 0.4 | 0.1 | 0.5 | 15.1 |
| <i>Fraxinus lanceolata</i> | -- | 1.1 | -- | -- | -- | 1.1 | 0.038 | 0.4 | 0.1 | 0.5 | 20.9 |
| Totals | 69.9 | 70.9 | 57.7 | 59.9 | 33.3 | 291.7 | 29.127 | 100.0 | 100.0 | 200.0 | |

Table 2. Density (stems/ha) of woody seedlings, small saplings, and large saplings encountered in the upland forest at Wildcat Hollow State Forest, Effingham County, Illinois.

| Species | Seedlings | Small Saplings | Large Saplings |
|-----------------------------|-----------|----------------|----------------|
| <i>Carya ovata</i> | 2166.7 | 258.3 | 26.6 |
| <i>Ulmus rubra</i> | 1583.3 | 475.0 | 23.3 |
| <i>Quercus alba</i> | 1583.3 | 100.0 | 23.3 |
| <i>Quercus velutina</i> | 1500.0 | 75.0 | -- |
| <i>Sassafras albidum</i> | 1500.0 | 141.7 | 46.7 |
| <i>Fraxinus americana</i> | 1083.3 | 500.0 | 43.3 |
| <i>Carya tomentosa</i> | 916.7 | 800.0 | 40.0 |
| <i>Amelanchier arborea</i> | 916.7 | 50.0 | 10.0 |
| <i>Prunus serotina</i> | 666.7 | 50.0 | 33.3 |
| <i>Asimina triloba</i> | 500.0 | 516.7 | 40.0 |
| <i>Ostrya virginiana</i> | 500.0 | 91.7 | 30.0 |
| <i>Carya glabra</i> | 500.0 | 16.7 | 3.3 |
| <i>Celtis occidentalis</i> | 416.7 | -- | -- |
| <i>Acer saccharum</i> | 333.3 | 316.7 | 73.3 |
| <i>Cornus florida</i> | 333.3 | 75.0 | 450.0 |
| <i>Quercus imbricaria</i> | 333.3 | 16.7 | -- |
| <i>Ulmus americana</i> | 166.7 | 58.3 | 40.0 |
| <i>Cercis canadensis</i> | 83.3 | -- | -- |
| <i>Diospyros virginiana</i> | 83.3 | -- | -- |
| <i>Morus rubra</i> | -- | 16.7 | -- |
| <i>Carya cordiformis</i> | -- | 8.3 | 6.7 |
| <i>Acer ginnala</i> | -- | 8.3 | -- |
| Totals | 15166.6 | 3575.1 | 889.8 |

APPENDIX 1.

Below is a vouchered list of the vascular flora of Wildcat Hollow State Forest, Effingham Co., Illinois from 2000 to 2006. Families, genera, and species are arranged alphabetically. Nomenclature and native status follows Mohlenbrock (2002). Authorship also follows Mohlenbrock (2002); in some cases, authorities given by him differ from those in other standard floras, e.g., Gleason & Cronquist (1991) and Flora of North America Editorial Committee (1993 onwards). Exotic taxa are preceded by an asterisk. Collection numbers follow each species. Collections made by Bob Edgin are preceded by E; those by Tucker are preceded by T. All specimens are deposited at EIU, with some duplicates at ILLS, MO, and ISM. Collections by Robert A. Evers, all made on 6 June 1967, are deposited at ILLS. Species that were observed, but not collected, are indicated by obs.

PTERIDOPHYTA

ASPLENIACEAE

Asplenium platyneuron (L.) Oakes; E4011;
Evers 90761
Asplenium rhizophyllum L.; T14768

DRYOPTERIDACEAE

Cystopteris bulbifera (L.) Bernh.; T14766
Cystopteris protrusa (Weatherby) Blasdell;
E4182; Evers 90765
Deparia acrostichoides (Sw.) M. Kato; obs.
Dryopteris marginalis (L.) A. Gray; E4012
Polystichum acrostichoides (Michx.) Schott;
E4013; Evers 90772
Woodsia obtusa (Spreng.) Torr.; E4713;
Evers 90731

EQUISETACEAE

Equisetum arvense L.; E4887

LYCOPODIACEAE

Huperzia lucidula (Michx.) Trev.; E4148

ONOCLEACEAE

Onoclea sensibilis L.; Evers 90757

OPHIOGLOSSACEAE

Botrychium dissectum Spreng.; E4862
Botrychium dissectum Spreng. var. *obliquum*
(Muhl. Clute; E4696
Botrychium virginianum (L.) Sw.; E4048;
Evers 90740

OSMUNDACEAE

Osmunda claytoniana L.; E4712

PTERIDACEAE

Adiantum pedatum L.; E3905; Evers 90771

PINOPHYTA

CUPRESSACEAE

Juniperus virginiana L.; E3946; Evers
90784

PINACEAE

**Pinus strobus* L.; E4909

MAGNOLIOPHYTA

DICOTYLEDONEAE

ACANTHACEAE

Ruellia humilis Nutt. var. *longiflora* (A.
Gray) Fern.; E4459

ACERACEAE

**Acer ginnala* Maxim.; T14193
Acer negundo L.; E4028; Evers 90733
Acer saccharinum L.; E4880
Acer saccharum Marsh.; E4899; Evers
90752

AMARANTHACEAE

**Amaranthus hybridus* L.; E4683
Amaranthus rudis J. Sauer; E4934

ANACARDIACEAE

Rhus aromatica Ait.; E4470
Rhus glabra L.; E4709
Toxicodendron radicans (L.) Kuntze;
T13693

ANNONACEAE

Asimina triloba (L.) Dunal; E4900

APIACEAE

Chaerophyllum procumbens (L.) Crantz.;
E3903
**Conium maculatum* L.; T14587

Cryptotaenia canadensis (L.) DC.; E4163;
Evers 90736
**Daucus carota* L.; E4461
Erigenia bulbosa (Michx.) Nutt.; T14610
Eryngium yuccifolium Michx.; E4457
Osmorhiza claytonii (Michx.) C.B. Clarke;
E4055
Osmorhiza longistylis (Torr.) DC.; E3911
Sanicula canadensis L.; E4485
Sanicula odorata (Raf.) Pryer & Phillippe;
T13687
**Torilis japonica* (Houtt.) DC.; E4486
Zizia aurea (L.) K. Koch; E3900, T14556

APOCYNACEAE

Apocynum androsaemifolium L.; T14195
Apocynum cannabinum L.; E4462

ARALIACEAE

Panax quinquefolius L.; T14761

ARISTOLOCHIACEAE

Aristolochia serpentaria L.; E4859
Asarum canadense L. var. *reflexum* (Bickn.)
Robins.; E3938

ASCLEPIADACEAE

Ampelamus albidus (Nutt.) Britt.; E4676
Asclepias hirtella (Pennell) Woodson;
E4464
Asclepias incarnata L.; E4669
Asclepias purpurascens L.; E4149
Asclepias syriaca L.; E4414
Asclepias tuberosa L.; obs.

ASTERACEAE

**Achillea millefolium* L.; E4501
Ageratina altissima (L.) R.M. King & H.
Robins.; E4434
Ambrosia artemisiifolia L.; E4727
Ambrosia bidentata Michx.; E4706
Ambrosia trifida L.; E4881
Antennaria plantaginifolia (L.) Hook.;
E3914
**Anthemis arvensis* L.; T14745
Arnoglossum atriplicifolium (L.) H. Robins.;
E4872
Aster cordifolius L.; E4710, E4864
Aster laevis L.; E4634
Aster lanceolatus Willd.; E4925, T14601
Aster lateriflorus (L.) Britt.; E4917
Aster novae-angliae L.; E4657
Aster ontarionis Wieg.; E4874
Aster pilosus Willd.; E4905
Aster praealtus Poir.; E4852
Aster shortii Lindl.; E4868
Aster sagittifolius Willd.; E4874

Aster turbinellus Lindl.; E4873
Bidens aristosa (Michx.) Britt.; obs.
Bidens bipinnata L.; E4497
Bidens comosa (A. Gray) Wieg.; E4935
Bidens discoidea (Torr. & A. Gray) Benth.;
E4903
Bidens frondosa L.; E4865, E4908
Cirsium altissimum (Muhl.) Spreng.; E4870
**Cirsium arvense* (L.) Scop. var. *horridum*
Wimm. & Grab.; E4654
Cirsium discolor (Muhl.) Spreng.; E4920
**Cirsium vulgare* (Savi) Tenore; E4673
Conyza canadensis (L.) Cronq.; E4689
Coreopsis lanceolata L.; E3989
Coreopsis tripteris L.; E4882
Echinacea pallida (Nutt.) Nutt.; T14752
Echinacea purpurea (L.) Moench.; E4670
Eclipta prostrata (L.) L.; E4924
Erechtites hieracifolia (L.) Raf.; E4632
Erigeron annuus (L.) Pers.; E4022, E4041;
E4160; Evers 90792
Erigeron philadelphicus L.; E3958; Evers
90764
Erigeron strigosus Muhl.; Evers 90792
Eupatoriadelphus fistulosus (Barratt) R.M.
King & H. Robins., obs.
Eupatorium perfoliatum L.; E4701
Eupatorium serotinum Michx.; E4919
Eupatorium sessilifolium L.; E4726, E4455
Euthamia graminifolia (L.) Nutt.; E4720
Helenium flexuosum Raf.; E4458
Helianthus divaricatus L.; E4420
Helianthus grosseserratus Martens; obs.
Helianthus mollis Lam.; E4630
Heliopsis helianthoides (L.) Sweet; E4894
Hieracium longipilum Torr.; E4853
Hieracium scabrum Michx.; E4722
Krigia biflora (Walt.) Blake; Evers 90705
Krigia dandelion (L.) Nutt.; obs.
Lactuca canadensis L.; E4416
Lactuca floridana (L.) Gaertn.; E4707
**Lactuca serriola* L.; E4677
Liatris aspera Michx.; E4910
Liatris pycnostachya Michx.; E4718
**Matricaria discoidea* DC.; E4498
Pseudognaphalium obtusifolium (L.)
Hilliard & Burt; E4855
Ratibida pinnata (Vent.) Barnh.; E4662
Rudbeckia hirta L.; E4147
Rudbeckia laciniata L.; E4698
Rudbeckia triloba L.; E4691
Senecio glabellus Poir.; E3947; Evers 90728
Silphium integrifolium Michx.; obs.
Silphium perfoliatum L.; E4679
Solidago canadensis L.; E4671
Solidago missouriensis Nutt.; E4717
Solidago nemoralis Ait.; E4906

Solidago ulmifolia Muhl.; E4443, T14563
 **Taraxacum officinale* Weber; T13278
Verbesina alternifolia (L.) Britt.; E4675
Vernonia gigantea (Walt.) Trel.; E4703
Xanthium strumarium L.; E4936

BALSAMINACEAE

Impatiens capensis Meerb.; E4170
Impatiens pallida Nutt.; T14734

BERBERIDACEAE

Podophyllum peltatum L.; E3930; Evers
 90749

BETULACEAE

Betula nigra L., obs.

BIGNONIACEAE

Campsis radicans (L.) Seem; E4463; Evers
 90777
Catalpa speciosa Warder, obs.

BORAGINACEAE

Hackelia virginiana (L.) I. M. Johnson;
 E4476
Mertensia virginica (L.) Pers.; T14616
Myosotis verna Nutt.; E3997

BRASSICACEAE

**Alliaria petiolata* (L.) Cavara & Grande,
 T14560
 **Arabis didyma* (L.) Heynh.; E4068
Arabis canadensis L.; Evers 90775
Arabis laevigata (Willd.) Poir.; T13280
Arabis shortii (Fern.) Gl.; E3960
 **Barbarea vulgaris* R. Br.; E3916
 **Capsella bursa-pastoris* (L.) Medic.;
 E3990
 **Cardamine hirsuta* L.; E3996
Cardamine parviflora L.; Evers 90706
Cardamine pennsylvanica Willd.; E4046
Dentaria laciniata Muhl.; E3924
 **Erophila verna* (L.) Chev.; T13279
Iodanthus pinnatifidus (Michx.) Steud.;
 E4922
 **Lepidium densiflorum* Schrad.; E4033
Lepidium virginicum L.; E3992
Rorippa palustris (L.) Besser; T14554
 **Thlaspi arvense* L.; E3995

CAESALPINIACEAE

Cercis canadensis L.; E4886; Evers 90741
Chamaecrista fasciculata (Michx.) Greene.;
 E4465
Gleditsia triacanthos L.; E4891; Evers
 90743
Gymnocladus dioicus (L.) K. Koch; T14191

CALLITRICHACEAE

Callitriche terrestris Raf.; Evers 90806;
 T14758

CAMPANULACEAE

Campanulastrum americanum (L.) Small;
 E4466
Lobelia inflata L.; T13586B
Lobelia siphilitica L.; E4655
Triodanis perfoliata (L.) Nieuwl.; E4056;
 Evers 90800

CANNABINACEAE

Humulus lupulus L.; E4892

CAPRIFOLIACEAE

**Lonicera japonica* Thunb.; E4165
 **Lonicera maackii* (Rupr.) Maxim.; T14739
Sambucus canadensis L.; E4682
Symphoricarpos orbiculatus Moench.;
 E4869; Evers 90788
Triosteum perfoliatum L.; E4155
Viburnum dentatum L.; T14604; Evers
 90711
Viburnum prunifolium L.; T14764
Viburnum recognitum Fern.; E4429

CARYOPHYLLACEAE

**Cerastium fontanum* Baum.; E3921
Cerastium nutans Raf.; E3921A; Evers
 90750
 **Dianthus armeria* L.; E4167; Evers 90782
Paronychia canadensis (L.) Wood, T14196
Paronychia fastigiata (Raf.) Fern.; E4446
Sagina decumbens (Ell.) Torr. & A. Gray;
 Evers 90778
Silene nivea (Nutt.) Otth.; T14733
Silene stellata (L.) Ait. f.; E4495
 **Stellaria media* (L.) Cyrillo; E3931

CELASTRACEAE

Celastrus scandens L.; E4451; Evers 90734
Euonymus atropurpureus Jacq.; E4912
 **Euonymus europaeus* L.; E4018

CHENOPODIACEAE

**Chenopodium album* L.; E4449, T14585

CISTACEAE

Lechea tenuifolia Michx.; E4851

CONVOLVULACEAE

**Ipomea hederacea* (L.) Jacq.; E4491
Ipomea pandurata (L.) G. F. W. Mey.;
 E4672

CORNACEAE

Cornus drummondii C. A. Mey.; E4150
Cornus florida L.; E3940; Evers 90714
Cornus racemosa Lam.; E4020

CORYLACEAE

Carpinus caroliniana Walt.; E4915
Corylus americana Walt.; E4902; Evers 90737
Ostrya virginiana (Mill.) K. Koch; E4914; Evers 90774

CUCURBITACEAE

Sicyos angulatus L.; E4688

CUSCUTACEAE

Cuscuta gronovii Willd., T14573

EBENACEAE

Diospyros virginiana L.; E4153

ELAEAGNACEAE

**Elaeagnus umbellata* Thunb.; E3917

EUPHORBIACEAE

Acalypha deamii (Weatherby) Ahles; T14576
Acalypha gracilens A. Gray; E4507, E4884
Acalypha rhomboidea Raf.; E4928
Acalypha virginica L.; E4506
Chamaesyce maculata (L.) Small; T14569
Chamaesyce nutans (Lag.) Small, T14555
Euphorbia corollata L.; E4643
Phyllanthus carolinensis Walt.; T13679
Poinsettia dentata (Michx.) Kl. & Garcke; E4678

FABACEAE

Amorpha fruticosa L.; E4037
Amphicarpaea bracteata (L.) Fern.; E4417
Baptisia alba (L.) Vent.; E4413
Desmodium glabellum (Michx.) DC., obs.
Desmodium glutinosum (Muhl.) A. Wood.; E4724
Desmodium illinoense A. Gray; E4668
Desmodium nudiflorum (L.) DC.; E4439
Desmodium paniculatum (L.) DC.; obs.
Desmodium rotundifolium DC.; Evers 90703
 **Kummerowia stipulacea* (Maxim.) Makino, T14189
 **Kummerowia striata* (Thunb.) Schind.; E4895
Lespedeza capitata Michx.; E4656
 **Lespedeza cuneata* (Dum.-Cours.) G. Don; E4896
Lespedeza procumbens Michx.; E4640
Lespedeza virginica (L.) Britt.; E4705

**Medicago lupulina* L.; E4681

**Medicago sativa* L.; T14753

**Melilotus albus* Medic.; E4684

**Melilotus officinalis* (L.) Pallas; T14731

Phaseolus polystachios (L.) BSP.; E4871

**Robinia pseudoacacia* L.; T14759

Strophostyles helvula (L.) Ell., E4687

Strophostyles leiosperma (Torr. & A. Gray)

Piper; E4641

**Trifolium campestre* Schreb.; E4036

**Trifolium hybridum* L.; E4040, T14567

**Trifolium pratense* L.; E4027

**Trifolium repens* L.; T14738

FAGACEAE

Quercus alba L.; E4005

Quercus bicolor Willd., obs.

Quercus imbricaria Michx.; E4898; Evers 90797

Quercus × *leana* Nutt., T14591

Quercus macrocarpa Michx., T14605

Quercus palustris Muench., T13685; Evers 90710

Quercus muhlenbergii Engelm. T14592

Quercus rubra L., T14590; Evers 90717

Quercus stellata Wangh.; E4918; Evers 90716

Quercus velutina Lam.; T13281

FUMARIACEAE

Dicentra cucullaria (L.) Bernh.; E3908

GENTIANACEAE

Frasera carolinensis Walt.; T14615

GERANIACEAE

Geranium carolinianum L.; E3993; Evers 90781

Geranium maculatum L.; E3928

GROSSULARIACEAE

Ribes missouriense Nutt.; E4693

HYDRANGEACEAE

Hydrangea arborescens L.; E4478; Evers 90773

HYDROPHYLLACEAE

Hydrophyllum appendiculatum Michx.; E3956

Hydrophyllum virginianum L.; T14614

HYPERICACEAE

Hypericum mutilum L.; E4883

Hypericum prolificum L.; E4460; Evers 90759

Hypericum punctatum Lam.; E4490

Hypericum sphaerocarpum Michx., T13686

JUGLANDACEAE

Carya cordiformis (Wang.) K. Koch; E4054

Carya glabra (Mill.) Sweet, obs.

Carya ovata (Mill.) K. Koch; T13690

Carya tomentosa (Poir) Nutt., T13684;
Evers 90712

Juglans nigra L., T14558

LAMIACEAE

Agastache nepetoides (L.) Ktze.; E4866

Blephilia hirsuta (Pursh.) Bernh.; E4177

Hedeoma pulegioides (L.) Pers.; E4440

**Lamium amplexicaule* L.; T 3283

**Lamium purpureum* L., T13282

Lycopus americanus Muhl., T14559

Lycopus uniflorus Michx., E4863

Monarda bradburiana Beck; E4044; Evers
90768

Monarda fistulosa L.; E4644

**Perilla frutescens* (L.) Britt.; E4927,
T14588

Physostegia virginiana (L.) Benth.; E4658

Prunella vulgaris L.; E4425

Pycnanthemum tenuifolium Schrad.; E4493

Pycnanthemum virginianum (L.) Dur. &
B.D. Jacks., obs.

Scutellaria incana Biehler; E4453, T13691

Scutellaria nervosa Pursh; E4025, T13691

Scutellaria parvula Michx.; Evers 90701;
T14765

Stachys tenuifolia Willd.; E4728

Teucrium canadense L.; E4448

LAURACEAE

Lindera benzoin (L.) Blume; E4475

Sassafras albidum (Nutt.) Nees; E4058

LINACEAE

Linum medium (Planch.) Britt.; E4702

LYTHRACEAE

Ammannia coccinea Rottb.; E4636

Rotala ramosior (L.) Koehne; T13676

MAGNOLIACEAE

Liriodendron tulipifera L., obs.

MALVACEAE

**Hibiscus trionum* L.; E4685

**Sida spinosa* L.; E4921

MENISPERMACEAE

Menispermum canadense L.; E4901; Evers
90739

MIMOSACEAE

Desmanthus illinoensis (Michx.) MacM.;
E4665

MOLLUGINACEAE

**Mollugo verticillata* L. E4659

MORACEAE

**Morus alba* L., E4875

Morus rubra L.; E4049; Evers 90760

OLEACEAE

Fraxinus americana L.; E4711; Evers 90795

Fraxinus lanceolata Borkh., T13689

Fraxinus pennsylvanica Marsh.; E4913

ONAGRACEAE

Circaea lutetiana L. spp. *canadensis* (L.)
Aschers & Magnus; E4435

Ludwigia alternifolia L.; E4484

Ludwigia palustris (L.) Ell.; T14747

Ludwigia peploides (HBK) Raven var.
glabrescens (Ktze.) Raven, E4035

Oenothera biennis L.; E4715

OXALIDACEAE

Oxalis stricta L.; T14190; Evers 90802

Oxalis violacea L.; E3918

PAPVERACEAE

Sanguinaria canadensis L.; T14613

PASSIFLORACEAE

Passiflora lutea L., T14194

PHYRMACEAE

Phryma leptostachya L.; E4436

PHYTOLACCACEAE

Phytolacca americana L.; E4437

PLANTAGINACEAE

Plantago aristata Michx.; T13680

**Plantago lanceolata* L.; E4032

Plantago rugelii Decne.; T14584

Plantago virginica L.; E3994; Evers 90793

PLATANACEAE

Platanus occidentalis L.; E4038

POLEMONIACEAE

Phlox divaricata L.; E3920

Phlox paniculata L.; E4686

Polemonium reptans L., T14589

POLYGALACEAE

Polygala sanguinea L.; E4721

POLYGONACEAE

- Antenoron virginianum* (L.) Roberty & Vautier; E4444
Fallopia scandens (L.) Holub; E4442
 **Persicaria cespitosa* (Blume) Nakai; E4933
 **Persicaria hydropiper* (L.) Opiz; E4431
Persicaria pensylvanica (L.) Small; E4635; Evers 90805
Persicaria punctata (Ell.) Small; E4496
 **Persicaria vulgaris* Webb. & Moq.; E4447; Evers 90730
 **Polygonum aviculare* L.; E4456
 **Rumex acetosella* L.; E4007; Evers 90799
 **Rumex crispus* L.; E3998
 **Rumex obtusifolius* L.; E4433

PORTULACACEAE

- Claytonia virginica* L.; E3945

PRIMULACEAE

- Dodecatheon meadia* L.; E3912; Evers 90723
Lysimachia hybrida Michx.; E4660
Lysimachia lanceolata Walt.; E4427
 **Lysimachia nummularia* L.; E3952
Samolus parviflorus Raf.; T14571

RANUNCULACEAE

- Actaea pachypoda* Ell.; E3909
Anemone virginiana L.; E4480
Anemonella thalictroides (L.) Spach; T13275
Aquilegia canadensis L., obs.
Delphinium tricorne Michx.; E3922
Enemion biternatum Raf.; T14611
Ranunculus abortivus L.; E3910
Ranunculus micranthus Torr. & A. Gray; E3942
Ranunculus septentrionalis Poir.; T13277
Thalictrum dasycarpum Fisch. & Lall.; E4146

RHAMNACEAE

- Ceanothus americanus* L.; Evers 90708

ROSACEAE

- Agrimonia parviflora* Soland.; T13677
Agrimonia pubescens Wallr.; T13678
Agrimonia rostellata Wallr.; E4418
Amelanchier arborea (Michx. f.) Fern.; E4009; Evers 90719
Aruncus dioicus (Walt.) Fern.; E4469; Evers 90770
Fragaria virginiana Duchesne, obs.
Geum canadense Jacq.; E4510

- Geum laciniatum* Murr.; T14732
Geum vernum (Raf.) Torr. & A. Gray.; E3943; Evers 90766
Malus ioensis (Wood) Britt.; T14760
Porteranthus stipulatus (Muhl.) Britt.; E4175; Evers 90709
 **Potentilla recta* L.; E4158; T14763
Potentilla simplex Michx.; E3937; Evers 90758
Prunus americana Marsh.; E4148
 **Prunus mahaleb* L.; E4858
Prunus serotina Ehrh.; E4708; Evers 90794
Rosa carolina L.; E4172; Evers 90779
 **Rosa multiflora* Thunb.; E4006
Rosa setigera Michx.; T14762
Rubus allegheniensis Porter; E4157; Evers 90791
Rubus flagellaris Willd.; E3951
Rubus occidentalis L.; T13681

RUBIACEAE

- Cephalanthus occidentalis* L., obs.
Diodia teres Walt.; E4482
Galium aparine L.; E3944
Galium circaezans Michx.; E4489; Evers 90767
Galium concinnum Torr. & A. Gray; E4057
Galium triflorum Michx.; E4723; Evers 90744
Houstonia purpurea L.; E4164; Evers 90725

RUTACEAE

- Ptelea trifoliata* L.; E4889

SALICACEAE

- **Populus alba* L.; E4653
Populus deltoides Marsh.; T13683
Salix interior Rowlee; T14736
Salix nigra Marsh.; E4888

SAXIFRAGACEAE

- Heuchera americana* L. var. *hirsuticaulis* (Wheelock) Rosend., Butt., & Lak.; E4060; Evers 90720
Penthorum sedoides L., obs.

SCROPHULARIACEAE

- Collinsia verna* Nutt., obs.
Lindernia dubia (L.) Pennell; T13675
Mimulus alatus Soland.; E4729
Penstemon digitalis Nutt.; E4487; Evers 90789
Penstemon pallidus Small; E4725
Scrophularia marilandica L.; E4699
 **Verbascum blattaria* L.; T14749
 **Verbascum thapsus* L.; E4699
 **Veronica arvensis* L.; E3999

Veronica peregrina L.; E4045
Veronicastrum virginicum (L.) Farw.,
 T14192

SIMAROUBACEAE

**Ailanthus altissima* (Mill.) Swingle; Evers
 90735

SOLANACEAE

Physalis heterophylla Nees; E4154
Solanum carolinense L.; E4159
Solanum ptychanthum Dunal; E4923

STAPHYLEACEAE

Staphylea trifolia L.; E4932; Evers 90738

TILIACEAE

Tilia americana L.; E4930; Evers 90724

ULMACEAE

Celtis occidentalis L.; E4878
Ulmus americana L.; T14566A
Ulmus rubra Muhl.; T13273

URTICACEAE

Boehmeria cylindrica (L.) Sw.; T14583
Laportea canadensis (L.) Wedd.; E4932
Parietaria pennsylvanica Muhl.; E4047,
 E4505; Evers 90748
Pilea pumila (L.) A. Gray; E4695, T14594

VERBENACEAE

Phyla lanceolata (Michx.) Greene; E4893
Verbena hastata L.; E4694
Verbena urticifolia L.; T14598

VIOLACEAE

Viola palmata L.; E4173
Viola pratensis Greene, E4861
Viola pubescens Ait. var. *eriocarpa*
 (Schwein.) Russell; E3957
 **Viola rafinesquii* Greene; E3936
Viola sororia Willd.; E3939
Viola striata Ait.; E3902; Evers 90732

VITACEAE

Parthenocissus quinquefolius (L.) Planch.;
 E4052; Evers 90790
Vitis aestivalis Michx.; E4876
Vitis cinerea (Engelm.) Engelm.; Evers
 90704
Vitis riparia Michx.; T13682
Vitis vulpina L.; E4890; Evers 90756

MONOCOTYLEDONEAE

ALISMATACEAE

Alisma subcordatum Raf.; T14750
Sagittaria latifolia Willd.; T14748

AMARYLLIDACEAE

Hypoxis hirsuta (L.) Coville; E3949

ARACEAE

Arisaema dracontium (L.) Schott; E4051;
 Evers 90747
Arisaema triphyllum (L.) Schott; E3927;
 Evers 90746

COMMELINACEAE

**Commelina communis* L.; E4424
Commelina diffusa Burm. f.; T14578
Tradescantia ohiensis Raf.; E3987
Tradescantia subaspera Ker; E4697
Tradescantia virginiana L.; E3932; Evers
 90713

CYPERACEAE

Carex albicans Willd.; T13272
Carex amphibola Steud.; T14767
Carex blanda Dewey; E3933, E3941,
 E3953, E4062
Carex brachyglossa Mack.; Evers 90751
Carex bushii Mack; E4161
Carex cephalophora Muhl.; E4065, E4733,
 Evers 90753
Carex communis L.H. Bailey, T13274
Carex conoidea Schk.; E4059
Carex cristatella Britt.; T14742
Carex festucacea Schk.; E4064; Evers
 90754
Carex glaucodea Tuckerm.; E4003; Evers
 90718
Carex grayi Carey; E4474
Carex grisea Wahl.; Evers 90762
Carex hirsutella Mack.; E3919, Evers 90786
Carex hirtifolia Mack.; E4016
Carex jamesii Schwein.; E4029
Carex lupulina Willd.; T14730
Carex muhlenbergii Schk. var. *enervis*
 Boott; Evers 90702
Carex pensylvanica Lam.; E4019, E4008
Carex retroflexa Muhl.; E3934; Evers 90742
Carex rosea Schk.; E3950
Carex shortiana Dewey; E4001
Carex squarrosa L.; T14599
Carex stipata Muhl.; T14741
Carex vulpinoidea Michx.; E4002, E4162,
 E4010
Cyperus acuminatus Torr. & Hook.; T14751

Cyperus esculentus L. var. *leptostachyus*
Boeckl.; T14744
Cyperus odoratus L.; T14561
Cyperus strigosus L.; T14562
Eleocharis elliptica Kunth.; E4042
Eleocharis ovata (Roth) Roem. & Schultes
var. *ovata*; E4637; E4187, E4179
Scirpus georgianus Harper; E4419, E4674
Scirpus pendulus Muhl.; T14727

DIOSCOREACEAE

Dioscorea quaternata (Walt.) J. F. Gmel;
E4053
Dioscorea villosa L.; Evers 90729

JUNCACEAE

Juncus antheratus (Wieg.) R.E. Brooks;
E4000
Juncus brachycarpus Engelm.; E4152,
E4734
Juncus dudleyi Wieg.; E4043
Juncus effusus L., obs.
Juncus tenuis Willd.; E4169
Juncus torreyi Coville; E4633

LEMNACEAE

Lemna minor L.; T14577A
**Spirodela punctata* (Mey.) C.H.
Thompson; T14577

LILIACEAE

Allium canadense L.; E4168
**Allium vineale* L.; T14740
Erythronium americanum Ker; T14608
**Ornithogalum umbellatum* L.; T14612
Polygonatum commutatum (Schult.) A.
Dietr.; E4014
Smilacina racemosa (L.) Desf.; E4002a
Trillium flexipes Raf.; E3901
Trillium recurvatum Beck.; E3925
Uvularia grandiflora Sm.; T13276

ORCHIDACEAE

Aplectrum hyemale (Willd.) Nutt.; E4015
Cypripedium pubescens Willd.; E4911
Galearis spectabilis (L.) Raf.; obs.
Liparis liliifolia (L.) Rich.; E4467
Spiranthes cernua (L.) Rich.; E4854,
T13586A

POACEAE

Agrostis gigantea Roth; E4663
Agrostis hyemalis (Walt.) BSP.; Evers
90801
Agrostis perennans (Walt.) Tuckerm.;
T14579A
Agrostis scabra Willd.; E4481

Andropogon gerardii Vitman; E4664
Andropogon virginicus L.; E4907
Aristida oligantha Michx.; E4645
Bouteloua curtipendula (Michx.) Torr.;
E4667
Brachyleytrum erectum (Roth) Beauv.;
E4916
**Bromus commutatus* Schrad.; E4184,
E4511
**Bromus inermis* Leyss.; T14754
Bromus pubescens Muhl.; E4428
**Bromus secalinus* L.; Evers 90787, 90796
Chasmanthium latifolium (Michx.) Yates,
T14553
Cinna arundinacea L.; E4719
**Dactylis glomerata* L.; E4067
Danthonia spicata (L.) Roem. & Schultes;
E4183; Evers 90715
Diarrhena obovata (Gl.) Brandenburg;
T14597
Dichanthelium acuminatum (Sw.) Gould &
Clark, T13692; E4180; Evers 90780
Dichanthelium clandestinum (L.) Gould;
E4732
Dichanthelium depauperatum (Muhl.)
Gould; Evers 90707
Dichanthelium dichotomum L. Gould var.
barbulatum (Michx.) Mohlenbr.; E4185
Dichanthelium microcarpon (Muhl.)
Mohlenbr.; E4508
Dichanthelium polyanthes (Schult.)
Mohlenbr., T14596
Dichanthelium praecocius (Hitche. &
Chase) Mohlenbr.; E4180
Digitaria filiformis (L.) Koel.; E4879
**Digitaria ischaemum* (Schreb.) Schreb.;
T14565
**Digitaria sanguinalis* (L.) Scop.; E4649
**Echinochloa crus-galli* (L.) Beauv.; E4488,
E4639, E4650
Echinochloa muricata (Michx.) Fern.;
E4450, T14581
**Eleusine indica* (L.) Gaertn.; E4642
Elymus canadensis L.; T14755
Elymus × *ebingeri* G. C. Tucker, T14593
Elymus hystrix L.; E4471
Elymus villosus Muhl.; E4502
Elymus virginicus L.; E4171
Eragrostis cilianensis (All.) Vign.; E4867
Eragrostis frankii C.A. Meyer, T14579B
Eragrostis spectabilis (Pursh.) Steud.;
E4647
**Festuca pratensis* Huds.; E3935, E4651
Evers 90763; T14743
Festuca subverticillata (Pers.) E.B. Alexeev;
E4017

Glyceria striata (Lam.) Hitchc.; E4178;
Evers 90769

Hordeum pusillum Nutt.; E4031

Leersia oryzoides (L.) Swartz; E4860

Leersia virginica Willd.; T14586

Muhlenbergia frondosa (Poir.) Fern.,
T14574

Muhlenbergia schreberi J. F. Gmel; E4423

Panicum dichotomiflorum Michx.; E4929,
T14580

Panicum virgatum L.; E4666

Paspalum setaceum Michx. var. *ciliatifolium*
(Michx.) Vasey; E4494

Paspalum setaceum Michx. var.

muhlenbergii (Nash) D.J. Banks; E4652

**Phalaris arundinacea* L., T14582

**Phleum pratense* L.; E3988

**Poa annua* L.; E4024

**Poa compressa* L.; E4034

Poa palustris L.; E3906, E4023

**Poa pratensis* L. E3935, E4063

Poa sylvestris A. Gray; Evers 90726

Setaria glauca (L.) Beauv.; E4648

**Setaria faberi* F. Herrm.; E4445

**Setaria viridis* (L.) P. Beauv.; T14564

Schizachyrium scoparium (Michx.) Nash;
E4661

Sorghastrum nutans (L.) Nash; E4897

**Sorghum bicolor* (L.) Moench.; E4680

**Sorghum halepense* (L.) Pers.; T14557

Sphenopholis obtusata (Michx.) Scribn.;
Evers 90776

Tridens flavus (L.) Hitchc.; E4700

Tripsacum dactyloides (L.) L.; T14737

Vulpia octoflora (Walt.) Rydb.; Evers 90798

SMILACACEAE

Smilax lasioneuron Hook., obs.

Smilax tamnoides L.; T13688; Evers 90745

TYPHACEAE

Typha angustifolia L.; T14746

Typha latifolia L.; E4631

