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Understanding Floristic Diversity Through a Database of Greene County Specimens

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Abstract

We present a floristic list of Greene County, Arkansas, based on accessioned collections from the Arkansas State University Herbarium (STAR). Currently, there are 1569 specimens representing 540 taxa from Greene County in STAR. Using the USDA Plants Database, plant species were analyzed according to whether or not they are native to the state as well as whether or not they have been previously documented as species occurring in the county. Having analyzed all the Greene County collections from STAR, we found 225 previously undocumented species. The data suggest that most of the specimens in the STAR collection were found in wooded areas and/or near water. This may be a reflection of sampling bias as two of the primary collectors of these specimens were primarily interested in bog habitats. For this reason, the Greene County collections may not fully represent all habitats in the county, but it is likely that they are a good representation of the county's seeps and bogs. The STAR Herbarium is emerging as a critical resource for understanding botanical diversity in the eastern counties of Arkansas, but it is clear that additional collections are necessary to fully represent all habitats in these areas.

Introduction

Floristic data gathered from herbarium collections are important to understanding the biodiversity of Greene County, Arkansas, as well as any other region of the world. Funk (2003) stressed the importance of herbaria by listing their many uses. Herbarium collections are a valuable resource for scientists, land managers, conservation agencies, and anyone who is otherwise interested in the botanical heritage of a region. Accession labels often identify the type of habitat where a specimen was collected (Table 1). This information can be used for species habitat preference studies and other important research. For example, Primack et al. (2004) used herbarium specimens to investigate changes in phenology over time.

Our work catalogued native and non-native plant species by the habitats in which they grew within Greene County, Arkansas. Since a major effort of the project was digitizing herbarium label information from accessions, this project is the first attempt to digitize the herbarium collection at STAR. If all herbarium accessions were available on the web, one would be able to rapidly search through years of county- or site-specific floristic data to aid in their research projects.

Table 1. Number of species represented in each of 12 habitat types in Greene County, Arkansas. The habitat types were categorized based on specimen label information provided by the collector of the specimens.

Habit	Habitat Symbol	Number of Species Recorded in Each Habitat
Wooded seep/Bog	WSB	198
Near water	NWA	183
Forest/Mixed mesic forest	MMF	104
Meadow	MDW	96
Upland Oak-Hickory forest	UOH	82
Waste Area	WTA	79
Roadside	RSD	54
Outcrop	OCP	20
Forest edge	FE	18
Sand	SND	18
Thickets	TKT	4
Bottoms	BOT	2

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Greene County, Arkansas, includes a diversity of habitats in Mississippi Alluvial Plain and Crowley's Ridge eco-regions (Figure 1). This diversity gives the county higher elevation ground covered in forest as well as lower, wetland and agricultural regions. Habitat diversity should translate into floristic diversity (Kohn and Walsh 1994). However, not all regions in the county have been sufficiently collected (Table 1). The human population in Greene County is growing, up 12.7% from 2000, which is above the overall 9.1% change for the state (US Census Bureau 2010). It is likely that the acreage of natural habitats will decline as room is made for this growing population. Having a record of where plant species grow within the county is important for targeting areas that should be preserved to maintain botanical diversity.

Vanderpool (1998) cited 224 species found in bogs in Greene County collected over two years. Although her paper provides information on the bog plants in Greene County, no synthesis exists for collections county-wide. The research presented here lists all collections from Greene County accessioned in STAR by habitat to provide a more complete depiction of known floristic diversity.

Methods

We catalogued Arkansas State University Herbarium accessioned collections by entering specimen label information into a Microsoft Excel spreadsheet. For each collection, the data from the specimen label were entered into 24 fields on the spreadsheet. These data included plant family, species, authority, STAR accession number, collector, collector number, habitat, and directions to collection site. Other information recorded, but not found for every specimen included township, range, section (TRS), habit, Geographical Positioning System (GPS) data, and flower color. A general habitat designation was assigned for each specimen based on the collectors' information provided on the labels. Summary statistics were generated for the botanical diversity of the area. Species were categorized as native or introduced as well as previously documented to occur in the county or not previously documented using the United States Department of Agriculture (USDA) Plants Database (USDA, NRCS 2012). The Greene County information in the Plants Database is, to date, generally based upon the works of Delzie Demaree (1943) and E.B. Smith (1988). Since it has been over twenty years since the most recent of these was published, the information

from this project will greatly improve understanding of plant diversity in the county.

Results

This project resulted in 1569 collections representing 540 taxa. Previously there were 543 species of vascular plants known from Greene County (Smith 1988). A list of documented taxa from the USDA Plants Database showed 225 of these 543 to be species that are not represented in STAR. However, there are 225 taxa represented from Greene County in STAR that are not on the USDA list for Greene County. This means that the total species count from the county should go from 543 taxa to 768 taxa, a 30% increase in known taxa. Most of the 540 taxa from STAR were collected from wooded seeps or bogs, forest or mixed-mesic forest, or near water (Table 1).

From the STAR collection there are three primary collectors of Greene County specimens. Former and current herbarium curators, E. Leon Richards, Staria Vanderpool, and Travis D. Marsico collected 867 out of the total 1569 specimens. Richards collected 418 of these Greene County specimens which represented 289 species, Vanderpool collected 336 specimens representing 137 species and Marsico collected 113 specimens representing 52 species. Altogether, collections were made from 1947 to 2010. For the most part, the primary collectors collected from the same habitats. Richards collected from the most diverse range of habitats, with eight habitats as opposed to two for Vanderpool and three for Marsico (Table 2). The majority of Vanderpool's specimens came from wooded seeps or bogs, Marsico's from mixed-mesic forests, and Richards' from upland oak-hickory forests, areas near water (such as lakesides), and wooded seeps or bogs.

Four hundred sixty-eight species in the STAR collection were native to the United States, and 72 were species that have been introduced to the United States. Of the 225 taxa documented in the USDA database that are not present in STAR, 208 are native and 17 are introduced (12% of species are introduced in Greene County). In addition, the Checklist of the Vascular Plants of Arkansas (Arkansas Vascular Flora Committee 2006) notes that there are 2235 taxa native to the state and 661 introduced (23% of species are introduced at state level). Ninety-three out of 130 families are dicotyledonous flowering plants (dicot), 23 are monocotyledonous flowering plants (monocot), 11 are pteridophytes, and 3 are gymnosperms. According to the Checklist there are 191 plant families

represented in the state. Of these families, 134 are dicot, 34 monocot, 19 pteridiophyte, and 2 gymnosperm. There are three taxa with Greene County specimens at STAR that are not documented to occur in Arkansas according to the Plants Database (USDA, NRCS 2012), but they do appear on the Checklist (Arkansas Vascular Flora Committee 2006). These are *Scirpus lineatus*, *Raphanus raphanistrum*, and *Pisum sativum*.

Table 2: Habitat range data for specimens collected by primary collectors.

	Richards	Vanderpool	Marsico
Total	418	336	113
Specimens			
FE	15	-	-
MDW	35	2	-
MMF	30	1	85
NWA	134	-	5
SND	2	-	-
UOH	28	-	-
WSB	105	333	22
WTA	34	-	-
No Habitat Information	21	-	1

Discussion

There are likely many more species in Greene County than are represented in the STAR collections to date. These collections represent samples mainly from wooded seeps, bogs, and areas near lakes or other water sources on Crowley's Ridge, but there are few ridge specimens from meadows and forests, or the open agricultural habitats and/or bottomland hardwoods of the Mississippi Alluvial Plain. Additional collection in underrepresented habitats of Greene County would likely increase the total species count. Still, some of the specimens collected over the years were deposited at other institutions. The fact that we found 225 taxa in STAR that had previously not been documented and published lists stresses the importance of networking collections to make herbarium data more accessible across institutions. New collections are definitely needed, but there is information to be found by looking at what is already

available in accessioned specimens at institutions other than those previously considered when developing county checklists.

Currently 32% of the state's flora is from non-native origins. Our current representation is that Greene County has about half that level of introduced species. This finding is telling because it is highly likely that Greene County is not home to proportionately fewer introduced taxa. Instead, we propose that based on the high level of agricultural intensity and pockets of urbanization surrounding Paragould, it is likely that the county has a similar rate of non-native species as the rest of Arkansas. Therefore, we suggest that the paucity of collections from disturbed areas have artificially deflated the number of non-native taxa represented in STAR specimens from Greene County.

The bulk of specimens from Greene County were collected by Vanderpool and Richards in two of the county's bogs. Bogs contain unusual and diverse flora and this was likely the reason for their focus. The bogs were located on Crowley's Ridge and most of the specimens were collected on the ridge, which is shown as forest through the middle of the county (Figure 1). The areas on either side of the ridge are primarily agricultural and are under-collected. The border areas of the agricultural fields would be an excellent place to search for specimens that are not yet documented in Greene County.

The funding for university herbaria is being cut in many locations (Gropp 2003). Yet digitization of collections is providing a means of more rapidly sharing data regarding plant distributions. These digitized data can then be used to model shifts in plant distribution under climate change, investigate changes in flowering phenology, and search for biodiversity hotspots.

Additionally, digitization of natural history collections is important for standardization purposes. Nomenclature is often updated, leaving curators of these collections the task of annotating their specimens to keep up with the taxonomic changes. Checklists and other paper books become outdated within short periods of time, highlighting a possible advantage of web-based publications for vascular plant nomenclature.

Three species in the STAR Greene County collections have not been previously documented in Arkansas according to the USDA database. These are *Raphanus raphanistrum*, *Scirpus lineatus*, and *Pisum sativum*. The *Raphanus raphanistrum* specimen (wild radish) was collected by E.L. Richards in 1979 and

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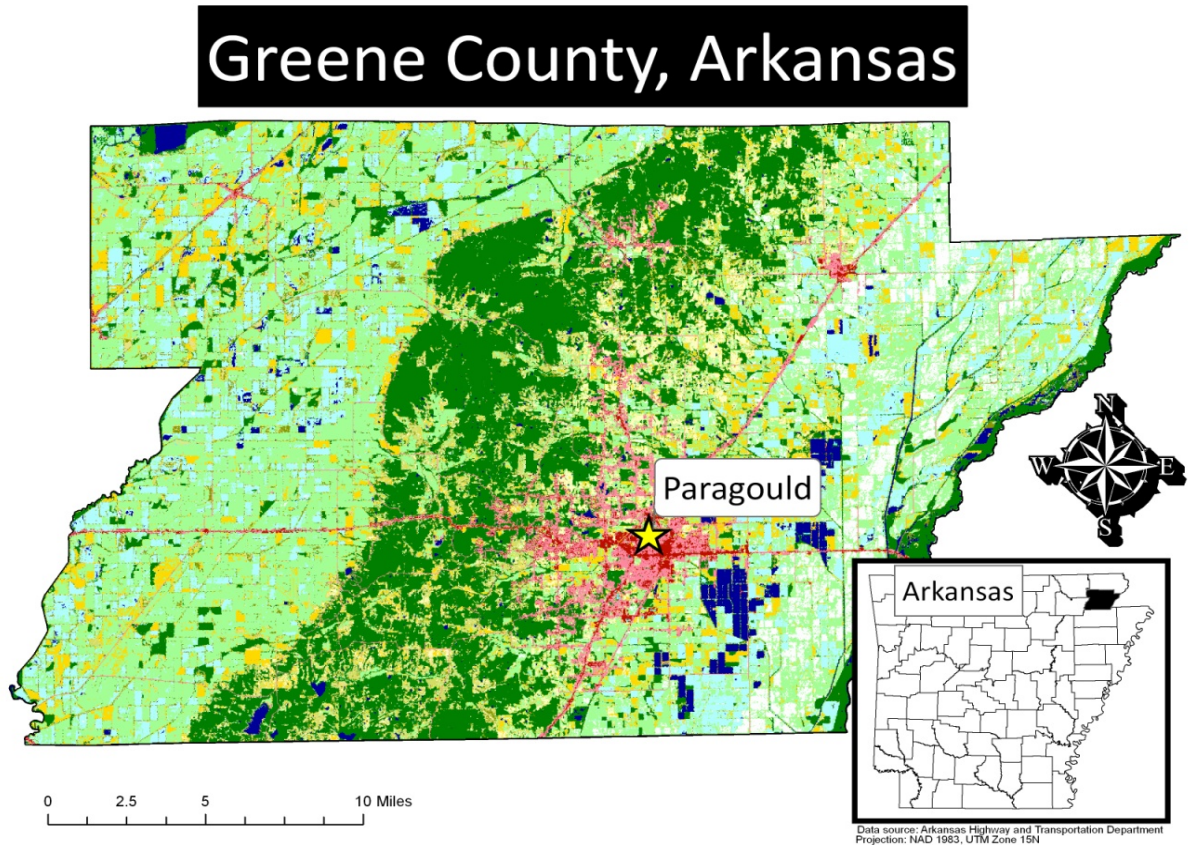


Figure 1. GIS land use map of Greene County, AR created by David Burge March 2012. The dark green area through the middle of the county represents forested Crowley's Ridge. The pink areas represent urbanization. Light green, light blue, and yellow areas are various types of agricultural land uses. Dark blue areas represent water, including large patches of aquaculture east of the Ridge.

annotated by Johnnie Gentry in 2005. The *Scirpus lineatus* specimen was collected in 1976 a "boggy area." The species identification was confirmed later by sedge experts Barney Lipscomb and Philip Hyatt. Although they are now listed in the Checklist (2006), likely based on these specimens, the records were not included in Smith's Key (1994) or the USDA Database, making these species virtually unknown to researchers who are outside the state. *Pisum sativum*, the garden pea, was collected by Gary Williams in 1991 and annotated by Brent Baker in 2008. This species has been growing in gardens in Arkansas for a very long time, and it likely had escaped from a garden, designating this as a waifed species.

This research shows the importance of digitizing herbarium data. By examining the contents of STAR, we have been able to increase the documented reports of species known to occur in Greene County, Arkansas, by 30%. There are many other counties represented in the Arkansas State University herbarium

and many other university herbaria much like STAR. If all the specimens in these collections were digitized and more easily shared and linked, it is likely that the known species richness of every county would increase. This more complete understanding of collections is critical if we are to understand plant diversity and distributions.

Acknowledgements

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Annotated checklist

Greene County taxa represented in the Arkansas State University Herbarium (STAR) are listed below in the annotated list. Taxa are organized first in the broad taxonomic categories of Pteridophytes, Gymnosperms, Angiosperm Dicots, and Angiosperm Monocots. Within these categories, they are arranged alphabetically by family, then by species. Following species name is (in order) authority, subspecies or variety (when applicable), habitats(s) where voucher(s) was/were collected, native status, documented status, and number of specimens representing this species in the collection. Habitats are designated as follows: WSB – Wooded Seep/Bog, MMF – Mixed Mesic Forest, NWA – Near Water, UOH – Upland Oak Hickory Forest, MDW – Meadow, WTA – Waste Area, OCP- Outcrop, SND – Sandy Area, FE – Forests Edge, TKT – Thickets, RSD – Roadside. If a species is native to the United States, it is designated as (N), and if it is introduced it is designated as (I). If a species is documented as a species that occurs in Greene County according to the USDA Plants Database, it is designated as (D), and if it has not been previously documented it is designated as (U). The Plant List (theplantlist.org) was used as the single reference for nomenclature.

Pteridophytes**ADIANTACEAE**

Cheilanthes lanosa (Michx.) D.C. Eaton; OCP,N,D. 1

ASPLENIACEAE

Asplenium bradleyi D.C. Eaton; OCP, N, D. 3

Asplenium platyneuron (L.) Britton, Stearns, & Poggenb.; WSB, NWA, UOH, OCP, FE, WTA, N, D. 8

BLECHNACEAE

Woodwardia areolata (L.) T. Moore; WSB, N, U. 7

DENNSTAEDTIACEAE

Pteridium aquilinum (L.) Kuhn in Decken; WSB, WTA, UOH, N, D. 4

DRYOPTERIDACEAE

Polystichum acrostichoides (Michx.) Schott; WSB, MMF, N, D. 5

EQUISETACEAE

Equisetum arvense L.; NWA, N, U. 2

Equisetum hyemale L.; NWA, N, D. 1

OPHIAGLOSSACEAE

Botrychium virginianum (L.) Sw.; MMF, N, U. 1

Botrychium dissectum Spreng. forma *dissectum*; WSB, N, U. 1

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

Fernald; WSB, N, U. 2

Ophioglossum vulgatum L.; WSB, NWA, N, U. 2

OSMUNDACEAE

Osmunda cinnemomea L.; WSB, N, D. 5

Osmunda regalis L.; WSB, N, D. 3

POLYPODIACEAE

Pleopeltis polypodioides (L.) E.G. Andrews & Windham; UOH, N, D. 1

THELYPTERIDACEAE

Phegopteris hexagonoptera (Michx.) Fee.; WSB, N, D. 2

WOODSIACEAE

Athyrium filix-femina (L.) Roth.; NWA, WTA, WSB, N, D. 16

Cystopteris protrusa (Weath.) Blasdell; NWA, N, U. 1

Onoclea sensibilis L.; NWA, WSB, N, D. 4

Woodsia obtusa Torr.; OCP, N, D. 2

Gymnosperms**CUPRESSACEAE**

Juniperus virginiana L.; WTA, WSB, MMF, N, D. 3

TAXODIACEAE

Taxodium distichum (L.) Rich.; WSB, NWA, N, D. 7

PINACEAE

Pinus echinata Mill.; WSB, WTA, UOH, MMF, FE, N, D. 10

Pinus taeda L.; MDW, N, U. 1

Angiosperm Dicots**ACANTHACEAE**

Ruellia pedunculata Torr. ex A. Gray; WSB, FE, N, D. 2

ADOXACEAE

Sambucus canadensis L.; UOH, WTA, RSD, WSB, N,D. 8

ALTINGIACEAE

Liquidambar styraciflua L.; MMF, N, D. 11

AMARANTHACEAE

Chenopodium album L.; MDW, N, U. 1

ANACARDIACEAE

Schmaltzia copallinum (L.) Small; MMF, N, D. 1

Toxicodendron copallinum (Engl.) Kuntze var. *latifolia*; WTA, MDW, N, D. 3

Toxicodendron radicans(L.) Kuntze var. *radicans*; RSD, N, D. 1

ANNONACEAE

Asimina triloba (L.) Dunal; UOH, NWA, WSB, MMF, N, D. 7

APIACEAE

Chaerophyllum dasycarpum (Hook ex S. Watson) Nutt.; MDW, N, U. 1

Cicuta maculata L.; RSD, NWA, N, D. 2

Conium maculatum L.; WTA, I, U. 2

Cryptotaenia canadensis (L.) DC.; WSB, N, D. 1

Daucus carota L.; MDW, WTA, MMF, I, D. 4

Erigeria bulbosa (Michx.) Nutt.; MMF, N, U. 1

Eryngium prostratum Nutt. ex DC.; MDW, NWA, N, D. 2

Eryngium yuccifolium Michx.; RSD, N, D. 1

Ptilimnium nuttallii (DC.) Britton; WTA, MDW, N, D. 2

Sanicula marilandica (L.)Torr. var. *canadensis*; WSB,

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- MMF, N, D. 3
Thaspium trifoliatum (L.) Gray; MMF, NWA, WSB, N, D. 5
Tiedemannia rigida (L.) C.&R.; WSB, N, U. 4
- APOCYNACEAE**
Amsonia tabernaemontana Walter var. *salicifolia* (Pursh) Woodson; RSD, N, U. 1
Apocynum cannabinum L.; WTA, N, U. 1
Asclepias purpurascens L.; NWA, N, U. 1
Asclepias tuberosa L.; NWA, WTA, RSD, N, D. 7
Asclepias variegata L.; WSB, N, D. 1
Asclepias verticillata L.; N, U. 1
Ampelamus laevis (Michx.) Krings; WSB, N, U. 1
- AQUIFOLIACEAE**
Ilex decidua Walter; WAB, NWA, UOH, MMF, N, D. 11
Ilex opaca Aiton; RSD, N, D. 1
- ARALIACEAE**
Aralia spinosa L.; UOH, MMF, WSB, N, D. 3
Hydrocotyle ranunculoides L.f.; NWA, N, U. 1
Panax quinquefolius L.; NWA, MMF, N, U. 2
- ARISTOLOCHACEAE**
Aristolochia serpentaria L.; MMF, N, U. 1
Asarum canadense L.; MMF, N, U. 1
- ASTERACEAE**
Achillea millefolium L.; MDW, RSD, N, D. 2
Antennaria plantaginifolia (L.) Richardson; MMF, UOH, RSD, FE, OCP, N, D. 5
Anthemis cotula L.; NWA, N, D. 1
Bidens bipinnata L.; OCP, N, D. 1
Bidens discoidea (Torr & A. Gray) Britton; UOH, N, D. 1
Boltonia asteroides (L.) L'Her. var. *recognita* Cronquist; WTA, I, U. 1
Bradburia pilosa (Nutt.) Semple; MDW, N, U. 3
Brickellia eupatorioides (L.) Shinnery var. *eupatorioides*; MDW, WSB, N, U. 3
Centaurea cyanus L.; WTA, I, U. 1
Cirsium discolor (Muhl. ex Willd.) Spreng.; MMF, N, U. 1
Conoclinium coelestinum (L.) DC.; WSB, N, U. 1
Coreopsis tinctoria Nutt.; MDW, WTA, NWA, N, D. 5
Coreopsis tripteris L.; WSB, WTA, MDW, N, U. 3
Crepis pulchra L.; RSD, I, U. 1
Elephantopus carolinianus Raesch; WSB, N, D. 2
Erechtites hieracifolia (L.) Raf.; UOH, NWA, N, D. 2
Erigeron annuus (L.) Pers.; NWA, N, D. 1
Erigeron philadelphicus L.; MDW, WTA, N, D. 4
Erigeron pulchellus Michx.; UOH, N, D. 1
Erigeron strigosus Muhl. ex Willd.; WTA, UOH, N, D. 3
Eupatorium album L.; WTA, N, U. 1
Eupatorium hyssopifolium var. *hyssopifolium* L.; NWA, N, U. 1
Eupatorium perfoliatum L.; WSB, NWA, MDW, N, U. 7
Eupatorium serotinum Michx.; NWA, N, U. 1
Eutrochium fistulosum (Barratt) E.E. Lamont; WSB, NWA, N, U. 8
Fleischmannia incarnata (Walter) R.M. King and H. Rob; NWA, N, U. 1
Gamochaeta purpurea (L.) Cabrera; MMF, RSD, N, D. 2
Helenium amarum (Raf.) H. Rock; NWA, MDW, WTA, UOH, WSB, N, D. 7
Helianthus annuus L.; WTA, N, D. 2
Helianthus atrorubens L.; WSB, N, U. 2
Helianthus hirsutus Raf.; NWA, N, U. 1
Helianthus maximiliani Schrad.; WTA, N, U. 1
Helianthus simulans E. Watson; WSB, N, U. 1
Hieracium gronovii Willd. ex L.; NWA, OCP, N, D. 3
Krigia biflora (Walter) S. F. Blake; WSB, WTA, N, U. 5
Krigia cespitosa (Raf.) K.L. Chambers; WTA, SND, N, D. 3
Krigia dandelion (L.) Nutt.; RSD, NWA, N, D. 2
Lactuca canadensis L.; FE, MDW, N, D. 2
Lactuca serriola L.; WTA, I, D. 2
Leucanthemum vulgare (Vaill.) Lam.; MDW, N, D. 1
Liatris aspera Michx.; OCP, FE, N, D. 2
Liatris squarrosa Michx.; NWA, N, U. 1
Matricaria chamomilla L.; MDW, I, U. 1
Mikania scandens (L.) Willd.; WSB, N, D. 4
Packera obovata (Muhl. ex Willd.) W.A. Weber and A. Love; WTA, N, U. 1
Packera tomentosa (Michx.) C. Jeffery; NWA, N, U. 1
Pappobolus microphyllus Kunth var. *microphyllus*; WSB, N, D. 1
Parthenium integrifolium L.; MMF, N, U. 1
Pluchea foetida (L.) DC.; NWA, N, U. 1
Pseudognaphalium obtusifolium (L.) Hilliard and B.L. Burtt; WSB, N, U. 1
Pyrhopappus carolinianus (Walter) DC.; WTA, N, D. 1
Rudbeckia hirta L.; WTA, MDW, WSB, MMF, N, D. 8
Silphium integrifolium Michx. var. *integrifolium*; WSB, N, U. 1
Solidago caesia L.; FE, WSB, N, U. 2
Solidago juncea Aiton; WTA, N, U. 1
Solidago nemoralis Aiton; WSB, UOH, N, U. 7
Solidago petiolaris Aiton; UOH, N, U. 11
Solidago ulmifolia Muhl. ex Willd.; UOH, N, D. 2
Symphotrichum lateriflorum (L.) A. Love & D. Love. var. *lateriflorum*; NWA, N, D. 1
Symphotrichum patens (Aiton) G.L. Nesom. var. *gracile* (Hook) G.L. Nesom; UOH, N, U. 1
Symphotrichum patens (Aiton) G.L. Nesom. var. *patentissimum* (Lindl. ex DC.) G. L. Nesom; WSB, N, U. 2
Symphotrichum patens (Aiton) G.L. Nesom. var. *patens*; UOH, N, U. 1
Symphotrichum pilosum (Willd.) G.L. Nesom. var. *pilosum*; WTA, MDW, N, D. 2
Taraxacum officinale Webb; WTA, MDW, N, D. 3
Vernonia baldwinii Torr.; WTA, N, D. 1
Vernonia missurica Raf.; NWA, MDW, WSB, N, D. 5
Verbena helianthoides Michx.; TKT, N, D. 1
- BALSAMINACEAE**
Impatiens capensis Meerb.; WSB, NWA, MMF, N, D. 7
- BERBERIDACEAE**
Podophyllum peltatum L.; WSB, MMF, UOH, WTA, OCP, NWA, N, D. 17
- BETULACEAE**
Alnus serrulata (Aiton) Willd.; WSB, NWA, N, D. 7

- Betula nigra* L.; WSB, NWA, WTA, N, D. 9
Carpinus caroliniana Walter; WSB, MMF, WTA N, D. 8
Corylus americana Walter; WSB, N, D. 5
- BIGNONIACEAE**
Campsis radicans (L.) Seem; WTA, N, D. 2
Catalpa speciosa (Warder ex Barney) Warder Ex Engelm; NWA, N, U. 1
- BORAGINACEAE**
Buglossoides arvensis (L.) I.M. Johnston; WSB, WTA,I,D.2
Cynoglossum virginianum L.; NWA, RSD, UOH, N, D. 4
Mertensia pulmonarioides Roth; MMF, N, U. 2
Myosotis verna Nutt.; MDW, MMF, N, D. 3
- BRASSICACEAE**
Arabidopsis thaliana (L.) Heynh.; WSB, RSD, I, D. 2
Boechera laevigata (Muhl. ex. Willd.) Al-Shehbaz; MMF, N, U. 2
Barbarea vulgaris R. Br.; NWA, I, U. 1
Brassica rapa L.; MDW, I, U. 1
Cardamine bulbosa (Schreb. ex Muhl.) Britton, Sterns, & Poggnb.; WSB, NWA, N, D. 2
Cardamine hirsuta L.; MMF, I, D. 1
Cardamine parviflora L. var. *arenicola* (Britton) O.E. Schulz; WSB, N, U. 1
Cardamine pensylvanica Muhl. ex Willd.; NWA, N,D.2
Lepidium densiflorum Schrad.; MDW, N, U. 2
Lepidium virginicum L. var. *virginicum*; WSB, SND, N, D. 3
Raphanus raphanistrum L.; I, U. 1
Rorippa sessiliflora (Nutt.) Hitchc.; WSB, N, U. 1
Sisymbrium officinale (L.) Scop.; MDW, I, U. 1
- CABOMBACEAE**
Brasenia schreberi J.F.Gmel.; NWA,N,U. 1
- CACTACEAE**
Opuntia humifusa (Raf.) Raf.; RSD, OCP, N, D. 3
Opuntia macrorhiza Engelm.; OCP, N, U. 1
- CAMPANULACEAE**
Lobelia cardinalis L.; WSB, NWA, N,U. 2
Lobelia inflata L.; SheND, WSB, N, D. 2
Lobelia puberula Michx.; WSB, NWA, N, U. 5
Lobelia siphilitica L.; NWA, N, U. 1
Lobelia spicata Lam.; MMF, WTA, UOH, N, D. 8
Triodanis perfoliata (L.) Nieuwl; WSB, SND, MDW, N,D.4
- CANNABACEAE**
Cannabis sativa L.; WTA, I, U. 1
- CAPRIFOLIACEAE**
Lonicera japonica Thunb.; WTA, RSD, I, D. 3
Lonicera sempervirens L.; WTA, N, D. 1
Symphoricarpos orbiculatus Moench.; UOH, N, D. 1
- CARYOPHYLLACEAE**
Agrostemma githago L.; RSD, NWA, I, U. 2
Arenaria serpyllifolia L.; FE, I, U. 1
Cerastium glomeratum Thuill.; WTA, NWA, I, D. 2
Dianthus armeria L.; RSD, UOH, MDW, SND,I,D.6
Paronychia fastigiata (Raf.) Fernald; OCP, N,D.1
Saponaria officinalis L.; WTA, I, D. 1
Silene stellata (L.) W.T. Aiton; WSB, SND, N, D. 7
Stellaria media (L.) Vill.; MDW, MMF, I, D. 2
- CELASTRACEAE**
Euonymus americanus L.; MMF, WSB, N, U. 3
- CISTACEAE**
Lechea tenuifolia Michx.; MDW, WSB, N, D. 4
- CLEOMACEAE**
Cleome houtteana Schltld.; WTA, RSD I, U. 2
- CLUSIACEAE**
Hypericum densiflorum var. *lobocarpum* (Gatt.) Svenson; NWA, WSB, N, D.6
- CONVOLVULACEAE**
Cuscuta compacta Juss; WSB, OCP, N, U. 7
Cuscuta cuspidata Engelm.; N, U. 1
Cuscuta pentagona Engelm.; N,D. 1
Ipomoea lacunosa L.; N, D. 1
Ipomoea pandurata (L.) G.F.W.Mey; NWA, WTA, N, D. 3
- CORNACEAE**
Cornus florida L.; MMF, UOH, WSB, OCP, N, D. 18
Cornus foemina Mill.; WSB, N, D. 9
Nyssa aquatica L.; NWA, WSB, UOH,N,D.9
Nyssa sylvatica Marshall; WSB, UOH, MMF, N, D. 10
- CUCURBITACEAE**
Cucurbita pepo L.; WTA, N, U.1
- CYRILLACEAE**
Cyrilla racemiflora L.; WSB, N, U. 1
- EBENACEAE**
Diospyros virginiana L.; WSB, MMF, UOH, NWA, N, D. 7
- ERICACEAE**
Batodendron arboreum Nutt.; UOH, N, D. 1
Cyanococcus pallidus (Aiton) Small; UOH, MMF, N, D. 2
Monotropa uniflora L.; WSB, N, U. 1
Polycodium stamineum (L.) Greene; MMF, N, D. 3
- EUPHORBIACEAE**
Croton capitatus Michx.; MDW, N, D. 2
Croton monanthogynus Michx.; MDW, N, U. 1
Euphorbia corollata L.; WSB, NWA, UOH, N, D.5
Euphorbia maculata (L.) Small; N, U. 1
- FABACEAE**
Apios americana Medik.; WSB, N, D. 5
Baptisia bracteata Elliott var. *leucophaea* (Nutt.) Kartesz & Gandhi; FE, N, U. 1
Chamaecrista fasciculata (Michx.) Greene; MDW, NWA, WTA, N, D. 4
Cercis canadensis L.; MMF, NWA, WTA, N, D. 4
Clitoria mariana L.; MMF, UOH, WSB, N, D. 6
Dalea purpurea Vent.; OCP, N, U. 1
Desmodium ciliare (Willd.) DC.; MMF, N, D. 1
Desmodium laevigatum (Nutt.) DC.; NWA, N, D.1
Desmodium nudiflorum (L.) DC.; WSB, N, D.2
Desmodium rigidum (Elliott) DC.; WSB, N, D. 1
Desmodium rotundifolium (Michx.)DC.; NWA, WSB, UOH, N, D. 3
Galactia regularis (L.) Britton & al.; NWA, I, D. 2
Kummerowia striata (Thunb.) Schindl.; UOH, I, U. 1
Lathyrus hirsutus L.; MDW, WTA, I, U. 3
Lathyrus latifolius L.; UOH, RSD, I, D. 2
Lathyrus pusillus Elliott; NWA, N, D. 1
Lespedeza repens (L.) W.P.C. Barton; RSD, N, D. 1

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- Lespedeza virginica* (L.) Britton; N, D. 1
Melilotus albus Medik.; I, U. 1
Orbexilum pendunculatum (Mill.) Rydb. var. *gracile* (Torr. & A. Gray) J.W. Grimes; RSD, NWA, N, D. 2
Pisum sativum L.; WTA, N, U. 1
Pueraria montana (Lour.) Merr. var. *lobata* (Willd.) Sanjappa & Preedee; RSD, WSB, WTA, NWA, I, D. 6
Robinia pseudoacacia L.; MDW, UOH, N, D. 3
Strophostyles helvula (L.) Elliott; WTA, N, D. 1
Stylosanthes biflora (L.) Britton & al.; MDW, WSB, N, D. 2
Tephrosia virginiana (L.) Pers.; MMF, OCP, N,D.3
Trifolium campestre Schreb.; MDW, I, D. 1
Trifolium dubium Sibth.; MDW, I, D. 2
Trifolium incarnatum L.; RSD, WTA, I, D. 7
Trifolium pratense L.; RSD, OCP, MDW, WTA, I, D. 7
Trifolium repens L.; MDW, I, U. 1
Vicia sativa L.; SND, I, D. 2
Vicia villosa Roth.; WTA, I, D. 2
Wisteria frutescens (L.) Poir.; NWA, N, D.1
- FAGACEAE**
Fagus grandifolia Ehrh.; WSB, UOH, NWA, N,D.8
Quercus alba L.; WSB, UOH, N, D. 5
Quercus coccinea Munchh.; NWA, N, U. 1
Quercus falcata Michx.; UOH, WSB, RSD, N, D.5
Quercus lyrata Walter; MMF, UOH, N, D. 5
Quercus macrocarpa Michx.; MMF, UOH, N, D.2
Quercus marilandica (L.) Munchh.; MMF, UOH, WSB, N, D. 3
Quercus michauxii Nutt.; UOH, WSB, N, D. 4
Quercus muehlenbergii Engelm.; NWA, N, D.1
Quercus phellos L.; UOH, WSB, NWA, N, D. 4
Quercus stellata Wangeh.; UOH, N, D. 1
Quercus velutina Lam.; UOH, NWA, N, D. 4
- GENTIACEAE**
Bartonia paniculata (Michx.) Muhl.; WSB, NWA, N, U. 5
Sabatia angularis (L.) Pursh.; MMF, N, D.1
- GERANIACEAE**
Geranium carolinianum L.; FE, N, D. 3
Geranium maculatum L.; SND, N, D. 1
- HALORAGACEAE**
Myriophyllum aquaticum (Vell.) Verdc.; NWA, I, D. 5
- HYDRANGEACEAE**
Hydrangea arborescens L.; WSB, N, U. 2
- HYPERICACEAE**
Hypericum hypericoides (L.) Crantz; UOH, N, D. 5
Hypericum mutilum L.; WSB, N, U. 4
Hypericum punctatum Lam.; WSB, SND, MMF, MDW, NWA, N, D. 8
Triadenum walteri (J.F. Gmel.) Gleason; WSB, N, U. 2
- JUGLANDACEAE**
Carya alba (L.) Nutt. ex Elliott; UOH, N, D. 2
Carya aquatica (F. Michx.) Nutt. ex Elliott; NWA, N, D. 1
Carya cordiformis (Wangenh.) K. Koch; UOH, N, D. 1
Carya glabra (Mill.) Sweet; WSB, N, D. 2
Carya illinoensis (Wangenh.) K. Koch; WSB, N, D.1
- Carya texana* Buckley; UOH, MMF, N, D.2
Juglans nigra L.; NWA, N, D. 1
- LAMIACEAE**
Cunila origanoides (L.)Britton; WSB, UOH, N, D.7
Hedeoma hispida Pursh; RSD, N, U. 1
Lamium amplexicaule L.; RSD, I, D. 2
Lamium purpureum L. var. *purpureum*; MDW, I, D. 2
Lycopus rubellus Moench.; NWA, N, D. 1
Monarda fistulosa L. var. *fistulosa*. NWA, MMF, N, D. 2
Perilla frutescens (L.) Britton; NWA, I, D. 2
Prunella vulgaris L. subsp. *vulgaris*; WSB, N, D. 1
Prunella vulgaris L. subsp. *lanceolata* (W.P.C. Barton) Piper & Beattie; WSB, NWA, N, D. 3
Pycnanthemum albescens Torr. & A. Gray; MDW, WSB, MMF, WTA, N, D. 7
Pycnanthemum tenuifolium Schrad.; RSD, MMF, MDW, WSB, UOH, OCP. 11
Salvia lyrata L.; NWA, RSD, MDW, MMF, N, D. 6
Scutellaria lateriflora L.; WSB, NWA, N, D. 4
Teucrium canadense L.; WTA, NWA, N, D. 3
Trichostema brachiatum L.; N, U. 1
Trichostema dichotomum L.; WTA, WSB, N, U.2
- LAURACEAE**
Lindera benzoin (L.) Blume; WSB, FE, N, D. 17
Sassafras albidum (Nutt.) Nees.; MMF, WSB, UOH, NWA, SND, RSD, N, D. 11
- LENTIBULARIACEAE**
Utricularia gibba L.; NWA, N, D. 2
- LINACEAE**
Linum striatum Walter var. *medium* (Planch.) B. Boivin; WSB, RSD, WTA, UOH, N, D. 11
- LOGANIACEAE**
Spigelia marilandica (L.) L.; MMF, N, U. 1
- LYTHRACEAE**
Ammannia coccinea Rottb.; NWA, N, U. 2
Cuphea viscosissima Jacq.; MMF, N, U. 1
- MAGNOLIACEAE**
Liriodendron tulipifera L.; WSB, NWA, UOH, MDW, N, D. 6
- MALVACEAE**
Hibiscus moscheutos L.; WTA, N, U. 1
Sida spinosa L.; WTA, N, D. 1
- MELASTOMATACEAE**
Rhexia virginica L.; WSB, MDW, NWA, N, D.8
- MELIACEAE**
Melia azedarach L.; MMF, I, D. 1
- MENISPERMACEAE**
Calycocarpum lyonii (Pursh) Nutt. ex A. Gray; WSB, N, U. 1
- MOLLUGINACEAE**
Mollugo verticillata L.; UOH, N, U. 4
- MONTIACEAE**
Claytonia virginica L.; MDW, NWA, MMF, WSB, N, D. 10
- MORACEAE**
Broussonetia papyrifera (L.) L'Her. ex Vent.; NWA, I, D. 1
Morus alba L.; NWA, UOH, I, U. 2
Morus rubra L.; UOH, SND, WSB, MMF, N, D. 5

NELUMBONACEAE*Nelumbo lutea* Pers.; NWA, N, D. 5**NYMPHAEACEAE***Nuphar advena* R. Br.; NWA, N, D. 1*Nymphaea odorata* Aiton. subsp. *odorata*; NWA, N, D. 5**OLEACEAE***Forestiera acuminata* (Michx.) Poir.; NWA, N, D. 1*Fraxinus americana* L.; NWA, WSB, N, D. 6*Fraxinus pennsylvanica* Marshall; NWA, MMF, N, D. 2*Fraxinus profunda* (Bush) Bush; WSB, N, U. 1*Ligustrum sinense* Lour.; SND, I, U. 1**ONAGRACEAE***Ludwigia alternifolia* L.; NWA, WSB, N, D. 4*Ludwigia decurrens* Walter; NWA, N, D. 2*Ludwigia palustris* (L.) Elliott; NWA, N, D. 2*Ludwigia peploides* (Kunth) P.H. Raven subsp.*glabrescens* (Kuntze) Shinnery; NWA, N, U. 1*Oenothera biennis* L.; NWA, WSB, N, U. 3*Oenothera laciniata* Hill; MDW, UOH, N, D. 4*Oenothera speciosa* Nutt.; WTA, N, D. 2*Peniophyllum linifolium* (Nutt.) Pennell; SND, N, D. 2**OROBANCHACEAE***Agalinis tenuifolia* (Vahl) Raf.; NWA, WTA, N, U. 3*Epifagus virginianus* (L.) Barton; NWA, N, D. 1*Pedicularis canadensis* L.; WSB, MMF, N, D. 5**OXALIDACEAE***Oxalis debilis* Kunth var. *corymbosa* (DC.) Lourteig;

SND, MMF, WTA, RSD, N, D. 5

Oxalis stricta L.; NWA, FE, MMF, UOH, N, D. 8**PAPAVERACEAE***Dicentra cucullaria* (L.) Bernh.; MMF, NWA, N, U. 3*Sanguinaria canadensis* L.; MMF, N, U. 2**PASSIFLORACEAE***Passiflora edulis* Sims; NWA, MMF, WTA, RSD, MDW, N, D. 5**PAULOWNIACEAE***Paulownia tomentosa* Steud.; WTA, I, U. 1**PENTHORACEAE***Penthorum sedoides* L.; WSB, NWA, N, U. 5**PHYTOLACCACEAE***Phytolacca americana* L.; WSB, WTA, N, D. 2**PLANTAGINACEAE***Bacopa rotundifolia* (Michx.) Wettst.; NWA, UOH, I, D. 5*Callitriche heterophylla* Pursh. var. *heterophylla*; NWA, N, D. 1*Chaenorhinum minus* (L.) Lange; UOH, NWA, WTA, I, D. 5*Chelone glabra* L.; WSB, N, D. 6*Gratiola neglecta* Torr.; NWA, N, D. 1*Gratiola virginiana* L.; WSB, N, D. 3*Nuttallanthus canadensis* (L.) D.A. Sutton; WTA, MDW, FE, WSB. 5*Plantago lanceolata* L.; UOH, I, D. 1*Plantago patagonica* var. *aristata* (Michx.) A. Gray.; MDW, N, D. 4*Veronica serpyllifolia* L.; MDW, I, U. 1**PLATANACEAE***Platanus occidentalis* L.; UOH, WTA, N, D. 4**POLEMONIACEAE***Phlox divaricata* L. subsp. *laphamii* (Alph. Wood) Wherry; WSB, NWA, N, D. 3*Phlox pilosa* L. subsp. *ozarkana* (Wherry) Wherry; MDW, N, U. 1*Phlox pilosa* L. var. *virens* (Michx.) Wherry; RSD, NWA, MMF, UOH, N, U. 9*Polemonium reptans* L.; NWA, N, U. 1**POLYGALACEAE***Polygala sanguinea* L.; WSB, MMF, N, D. 2*Polygala verticillata* L.; WSB, N, U. 1**POLYGONACEAE***Persicaria hydropiperoides* (Michx.) Small; WSB, WTA, N, D. 6*Persicaria lapathifolia* (L.) Delarbre; NWA, N, U. 2*Persicaria pennsylvanica* (L.) M. Gomez; RSD, WSB, N, D. 3*Persicaria punctata* (Elliott) Small; NWA, N, U. 1*Persicaria sagittata* (L.) H. Gross; NWA, WSB, N, D. 6*Polygonum aviculare* L. subsp. *aviculare*. MDW, I, D. 1*Rumex acetosella* L.; WSB, SND, OCP, MDW, I, D. 5*Rumex altissimus* Alph. Wood; N, D. 1**PRIMULACEAE***Lysimachia radicans* Hook; WSB, N, D. 1*Nummularia lanceolata* (Walter) Kuntz; WSB, N, U. 2*Nummularia quadriflora* (Sims) Farw.; N, U. 2**RANUNCULACEAE***Anemonella thalictroides* (L.) Spach.; WTA, RSD, NWA, MMF, N, U. 4*Delphinium tricornis* Michx.; NWA, N, U. 1*Enemion biternatum* (Torr. & A. Gray) Raf.; WSB, N, U. 1*Hydrastis canadensis* L.; WSB, N, U. 3*Ranunculus abortivus* L.; MDW, RSD, N, D. 3*Ranunculus bulbosus* L.; MDW, RSD, UOH, I, U. 5*Ranunculus fascicularis* Muhl. ex Bigelow; WSB, N, D. 1*Ranunculus harveyi* (A. Gray) Britton; NWA, N, U. 1*Ranunculus repens* L. var. *hispidus* (Michx.) Chapm.; MDW, N, U. 1*Ranunculus micranthus* Nutt.; MDW, N, U. 1*Ranunculus pusillus* Poir in Lam. et al.; WSB, NWA, N, D. 2*Ranunculus sardous* Crantz; MDW, WTA, RSD, I, U. 4**RHAMNACEAE***Ceanothus americanus* L.; FE, N, D. 1*Fragula caroliniana* (Walter) A. Gray; FE, N, D. 1**ROSACEAE***Agrimonia parviflora* Aiton; WSB, N, D. 1*Amelanchier arborea* (F. Michx.) Fernald; UOH, N, D. 1*Callionia simplex* (Michx.) Greene; MMF, WTA, MDW, UOH, NWA, WSB, N, D. 12*Crataegus marshallii* Eggl.; NWA, WSB, UOH, N, D. 4*Eupatorium rostellatum* Nieuwl.; WSB, N, D. 1*Padus virginiana* (L.) M. Roem.; MMF, N, U. 1*Prunus angustifolia* Marshall; WTA, N, D. 1*Prunus hortulana* L.H. Bailey; MMF, N, U. 1*Prunus serotina* Ehrh.; UOH, MMF, NWA, WSB, N, D. 8*Rosa carolina* L.; WTA, N, D. 1*Rosa palustris* Marshall; WSB, N, D. 1

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Rubus argutus Link; MMF, WSB, N, U. 2

Spiraea prunifolia Siebold & Zucc.; UOH, I, U. 1

Spiraea tomentosa L.; WSB, N, D. 4

RUBIACEAE

Cephalanthus occidentalis L.; WSB, NWA, MMF, N, D. 5

Cruciata pedemontana (Bellardi) Ehrend.; RSD, I, U. 1

Diodella teres (Walter) Small; MMF, MDW, WSB, N, U. 5

Diodia virginiana L.; WSB, MDW, N, D. 2

Galium aparine L.; MMF, MDW, N, D. 3

Galium obtusum Bigelow; WSB, N, U. 3

Galium tinctorium L.; NWA, N, U. 1

Houstonia pusilla Schoepf; WTA, NWA, N, D. 3

Houstonia longifolia Gaertn.; NWA, WTA, MMF, N, D. 3

Mitchella repens L.; NWA, WSB, N, D. 6

SALICACEAE

Populus alba L.; UOH, I, D. 1

Salix nigra Marshall; WSB, NWA, N, D. 5

SAPINDACEAE

Acer rubrum L.; MMF, WSB, NWA, BOT, UOH, N, D. 22

Acer saccharum var. *saccharum* Marshall; MMF, N, U. 2

Aesculus glabra Willd.; EOW, N, U. 1

Aesculus pavia L.; MMF, WTA, NWA, UOH, FE, N, D. 14

SAURURACEAE

Saururus cernuus L.; WSB, NWA, N, D. 12

SAXIFRAGACEAE

Saxifraga palmeri Bush; UOH, N, U. 1

SCROPHULARIACEAE

Mimulus alatus Aiton; NWA, WSB, N, D. 3

Penstemon tenuis Small; NWA, N, U. 1

Verbascum thapsus L.; FE, I, D. 1

Veronica peregrina L.; NWA, N, D. 2

SIMAROUBACEAE

Ailanthus altissima (Mill.) Swingle; NWA, I, U. 1

Leitneria floridana Chapm.; WSB, N, D. 1

SOLANACEAE

Datura stramonium L.; MDW, I, U. 2

Physalis virginiana Mill.; UOH, N, U. 1

Solanum carolinense L.; MDW, UOH, WTA, RSD, N, U. 9

Solanum elaeagnifolium Cav.; MDW, RSD, N, U. 2

SPHENOCLEACEAE

Sphenoclea zeylanicum Scop.; MMF, NWA, I, D. 2

TAMARICACEAE

Tamarix ramosissima Ledeb.; RSD, I, U. 1

ULMACEAE

Planera aquatica J.F. Gmel.; WSB, N, D. 1

Ulmus alata Michx.; MDW, NWA, UOH, N, D. 6

Ulmus americana L.; SND, N, D. 1

Ulmus pumila L.; MDW, I, U. 1

Ulmus rubra Muhl.; MMF, UOH, N, D. 2

URTIACEAE

Boehmeria cylindrica (L.) Sw.; NWA, WSB, N, D. 10

Laportea canadensis (L.) Wedd.; WSB, N, U. 1

VALERIANACEAE

Valerianella radiata (L.) Dufr.; WTA, SND, N, D. 3

VERBENACEAE

Phyla lanceolata (Michx.) Greene; N, D. 1

Verbena bracteata Cav. ex Lag. & Rodr.; SND, N, D. 1

Verbena simplex Lehm.; MDW, N, U. 1

Verbena stricta Vent.; RSD, N, D. 3

Verbena urticifolia L.; MDW, N, D. 2

VIOLACEAE

Crocion pubescens Nieuwl.; MMF, N, U. 1

Lophion striatum (Aiton) Nieuwl. & Kaczem.; NWA, N, U. 3

Viola bicolor Pursh; MDW, MMF, N, D. 4

Viola palmata L.; UOH, WSB, MMF, N, U. 6

Viola pedata L.; NWA, MMF, RSD, MDW, N, D. 6

Viola sororia Willd.; MDW, NWA, WSB, N, D. 9

VITACEAE

Ampelopsis cordata Michx.; NWA, N, U. 1

Cissus palmata Poir.; NWA, N, U. 1

Parthenocissus quinquefolia (L.) Planch; WSB, N, D. 2

Vitis aestivalis Michx.; WSB, N, D. 1

Vitis cinerea (Engelm.) Engelm. ex Millardet; UOH, NWA, WSB, N, U. 3

Vitis rotundifolia Michx.; UOH, WSB, N, U. 3

Angiosperm Monocots

ACORACEAE

Acorus calamus L.; WSB, N, U. 2

ALISMATACEAE

Alisma subcordatum Raf.; WSB, N, D. 2

Sagittaria graminea Michx.; NWA, N, U. 1

AMARYLLIDACEAE

Allium ampeloprasum L.; NWA, WSB, I, U. 2

Allium canadense L.; MDW, MMF, N, U. 2

Hymenocallis occidentalis (Leconte) Kunth. var. *occidentalis*; WSB, N, U. 1

Narcissus poeticus L.; MMF, I, U. 1

ARACEAE

Arisaema dracontium (L.) Schott; WSB, MMF, N, D. 3

Arisaema triphyllum (L.) Schott; WSB, N, U. 1

Spirodela polyrrhiza (L.) Scheild.; NWA, N, D. 1

ASPARAGACEAE

Maianthemum racemosum (L.) Link.; MMF, NWA, N, D. 5

Polygonatum biflorum (Walter) Elliott; WSB, MMF, N, D. 2

Uvularia sessilifolia L.; WSB, N, U. 2

COMMELINACEAE

Commelina communis L.; MDW, I, U. 2

Commelina virginica L.; NWA, WSB, N, D. 5

Tradescantia ohiensis Raf.; RSD, N, U. 1

CYPERACEAE

Carex bromoides Willd.; WSB, N, U. 1

Carex crinita Lam.; WSB, N, U. 3

Carex festucacea Schkuhr ex Willd.; NWA, N, U. 1

Carex hirsutella Mackenzie; WSB, N, U. 1

Carex lurida Wahlenberg; NWA, WSB, N, D. 3

Carex oxylepis Torr. & Hook; N, U. 2

Carex stricta Lam; WSB, N, U. 3

Carex swanii (Fernald) Mack.; WSB, N, D. 2
Carex vulpinoidea Michx.; NWA, N, D. 2
Cyperus echinatus (L.) Alph. Wood; MDW, NWA, RSD, MMF, N, D. 5
Cyperus esculentus L.; MMF, I, U. 1
Cyperus odoratus L.; NWA, N, U. 1
Cyperus strigosus L.; NWA, N, D. 1
Dulichium arundinaceum (L.) Britton; WSB, N, D. 4
Eleocharis acicularis (L.) Roem.&Schult.; NWA, N, D. 1
Fimbristylis autumnalis (L.) Roem.&Schult.; NWA, N, D. 2
Fuirena simplex Vahl; NWA, N, U. 3
Isolepis carinata Hook.&Arn. ex Torr.; NWA, N, U. 1
Kyllinga pumila Michx.; NWA, N, U. 1
Scirpus cyperinus (L.) Kunth.; NWA, N, D. 1
Scirpus lineatus Michx.; NWA, N, U. 1

DIOSCOREACEAE

Dioscorea villosa L.; WSB, N, D. 2

HYACINTHACEAE

Muscari neglectum Guss. ex Ten.; I, U. 1

HYDROCHARITACEAE

Egeria densa Planch.; NWA, I, U. 1

IRIDACEAE

Iris domestica (L.) Goldblatt and Mabb. FE, I, D. 1
Iris x germanica L.; MMF, WTA, I, U. 2
Iris virginica L.; WTA, WSB, NWA, N, U. 5
Sisyrinchium angustifolium Mill.; WSB, MMF, N, U. 2
Sisyrinchium atlanticum E.P. Bicknell; WTA, N, U. 1
Sisyrinchium campestre E.P. Bicknell; WTA, MDW, N, U. 2
Sisyrinchium langloisii Greene; WTA, MDW, N, U. 2

JUNCEAE

Juncus acuminatus Michx.; NWA, N, U. 1
Juncus brachycarpus Engelm.; MDW, N, U. 1
Juncus effusus L.; NWA, N, D. 1
Juncus validus Coville; WSB, NWA, N, U. 2
Luzula bulbosa (Alph. Wood) Smyth & L.C. Smyth; MMF, N, U. 2
Luzula echinata (Small) F.J.Herm; WTA, WSB, MMF, N, U. 5

LILIACEAE

Lilium superbum L.; MMF, NWA, RSD, N, U. 3

MARANTACEAE

Thalia dealbata Fraser; NWA, N, D. 1

MELANTHIACEAE

Trillium recurvatum L.C. Beck; WSB, MDW, NWA, N, D. 8

ORCHIDACEAE

Isotria verticillata (Muhl. ex Willd.) Raf.; NWA, WSB, N, U. 4
Liparis liliifolia (L.) Rich. ex Lindl.; MMF, N, D. 1
Malaxis unifolia Michx.; WSB, N, U. 1
Platanthera ciliaris (L.) Lindl.; NWA, N, D. 1
Platanthera clavellata (Michx.) Leur.; WSB, NWA, N, D. 8
Spiranthes cernua (L.) Rich.; WSB, MMF, N, U. 3
Spiranthes tuberosa Raf.; UOH, FE, N, U. 5
Spiranthes vernalis Engelm. & A. Gray; MDW, N, U. 1
Tipularia discolor (Pursh) Nutt.; WSB, N, U. 2

POACEAE

Agrostis perennans (Walter) Tuck.; NWA, WSB, N, U. 2
Alopecurus carolinianus Walter; WSB, N, U. 1
Andropogon virginicus L.; NWA, N, D. 2
Aristida dichotoma Michx.; MDW, N, D. 2
Aristida lanosa Muhl.; MDW, N, U. 1
Aristida oligantha Michx.; MDW, N, D. 2
Arundinaria gigantea (Walter) Muhl.; N, D. 1
Brachiaria platyphylla (Munro Ex C. Wright) Nash.; WSB, N, U. 2
Chasmanthium laxum (L.) H.O. Yates; WSB, N, D. 2
Cinna arundinacea L.; WSB, N, U. 1
Cynodon dactylon (L.) Pers.; MDW, I, D. 1
Dichanthelium acuminatum (Sw.) Gould & C.A. Clark; MDW, N, D. 1
Digitaria ischaemum (Schreb.) Muhl.; NWA, I, D. 2
Eleusine indica (L.) Gaertn.; NWA, I, D. 1
Eragrostis intermedia Hitchc.; NWA, MDW, N, D. 3
Eragrostis pilosa (L.) P.Beauv.; MDW, N, U. 1
Eragrostis spectabilis (Pursh) Steud.; TKT, N, D. 1
Hordeum pusillum Nutt.; MDW, N, U. 1
Leersia oryzoides (L.) Sw.; NWA, N, D. 2
Panicum anceps Michx.; TKT, N, D. 1
Panicum boscii Poir.; RSD, N, D. 1
Panicum dichotomiflorum Michx.; NWA, N, D. 1
Panicum dichotomum L.; NWA, N, D. 1
Panicum polyanthes Schult.; UOH, N, D. 1
Panicum scoparium Lam.; FE, N, U. 1
Poa autumnalis Muhl. ex Elliott.; MMF, N, U. 1
Poa chapmaniana Scribn.; MDW, N, U. 1
Saccharum giganteum (Walter) Pers.; NWA, WSB, N, D. 3
Setaria parviflora (Poir.) M. Kerguelen; MDW, N, U. 1
Sorghum halepense (L.) Pers.; WTA, RSD, I, D. 2
Sphenopholis obtusata (Michx.) Scribn.; NWA, N, U. 1
Steinchisma hians (Elliott) Nash; MDW, N, D. 1
POTAMOGETONACEAE
Potamogeton diversifolius Raf.; NWA, N, D. 6
SMILACACEAE
Smilax bona-nox L.; MDW, N, D. 2
Smilax glauca Walter; WSB, MMF, N, D. 3
Smilax rotundifolia L.; WSB, MMF, N, D. 8
TYPHACEAE
Sparganium americanum Nutt.; WSB, N, U. 2
Typha latifolia L.; NWA, N, D. 2
XYRIDACEAE
Xyris jupicai Rich.; WSB, N, D

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