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FLORISTIC INVENTORY OF THE COOPER WOODS–SKINNER WOODS COMPLEX, BALL STATE UNIVERSITY, DELAWARE COUNTY, INDIANA

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ABSTRACT. Owned by Ball State University, both Cooper Woods (CW) and Skinner Woods (SK) are located in northwest Muncie, Indiana. Together the two woodlands are ~19 ha. A floristic survey of both sites revealed 356 taxa representing 225 genera in 90 families. The 12 families with the highest number of taxa in decending order were Poaceae, Asteraceae, Cyperaceae, Rosaceae, Fabaceae, Brassicaceae, Fagaceae, Lamiaceae, Apiaceae, Asparagaceae, Polygonaceae, and Ranunculaceae; these 12 families included 197 (55.3%) of the species documented. Of the 356 documented species, 276 (77.5%) were native and 80 (22.5%) were non-native. A physiognomic analysis for the combined sites revealed the flora consisted of 77 (21.6%) woody species, 202 (56.8%) herbaceous forbs and vine species, 74 (20.8%) graminoid species (grasses and sedges), and three (0.8%) ferns and allies. The FQI and mean C for the native flora were 55.0 and 3.4, respectively, and for all species were 48.6 and 2.6, respectively. The native FQI and mean C imply that the complex is of nature preserve quality, thus possessing sufficient conservatism and species richness to be of importance from a regional perspective. However, the difference between the mean C values (native vs. all species) suggests that exotics are having a negative impact on the native flora, an observation especially true for CW. No state endangered, threatened or rare species were reported, but two species, *Rudbeckia fulgida* var. *fulgida* and *Spiranthes ovalis* var. *erostellata*, are on the state watch list. Five Delaware County records were reported, three native species (*Cardamine parviflora* var. *arenicola*, *Carex squarrosa*, *Rudbeckia fulgida* var. *fulgida*) and two non-native species (*Chaiturus marrubiastrum* and *Lathyrus latifolius*).

Keywords: Floristic quality index (FQI), county records, vascular plants, flora-Indiana, physiognomic analysis, Delaware County IN

INTRODUCTION

Located in central Delaware County, Indiana, the Cooper-Skinner Area is owned by Ball State University and managed by the Ball State University Field Station and Environmental Education Center (FSEEC; Fig. 1). According to FSEEC documents, the Cooper-Skinner Area is comprised of many distinct microenvironments with each habitat rich in diversity for field research and environmental education purposes. Some of the areas have undergone restoration (i.e., planting with native wetland, forest, or prairie species), while others are left to develop naturally (John Taylor, Land Manager of FSEEC, Pers. Comm.). Despite the heavy use of the two property complex in both teaching and research, there have been no publications concerning the flora and fauna.

An inventory is the simplest method to document species diversity and is necessary in monitoring changes in species composition of a site over time. Measures of species diversity can be used as indicators of the well-being of ecological systems (Magurran 1988; Bourdaghs 2006). For this study, ecological status was determined by calculating the Floristic Quality Index and average Coefficient of Conservatism (mean C) (see Swink & Wilhelm 1994 and the methods section). Although a list of tree species occurring at Cooper Woods exists (Badger, Pers. Comm.), no such list exists for Skinner Woods. In addition, there are no complete inventories of the flora occurring at either site. Consequently, the overall goal of this project was to produce a vouchered list of the flora within Cooper Woods and Skinner Woods. The specific objectives of this research were: (1) to identify and voucher all vascular plant

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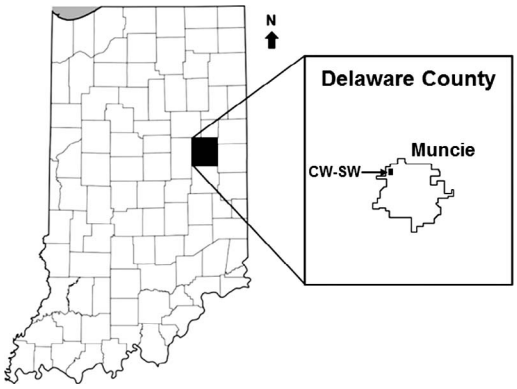

Figure 1.—Map of Indiana showing the location of Delaware County (left) and the Cooper Woods – Skinner Woods complex within the city of Muncie (right).

taxa within each woodland; and (2) to use the species lists to calculate the Floristic Quality Index (FQI) and the average Coefficient of Conservatism (mean C) for the entire site and for the two separate woodlands (Swink & Wilhelm 1994; Rothrock 2004). These results will allow Cooper-Skinner to be compared to other nature preserves studied in Indiana, especially east-central Indiana. They also allow identification of areas of special concern that support rare or threatened plants, if any, and communities sensitive to disturbance.

SITE DESCRIPTION

The study site.—The Cooper-Skinner Field Area is located in northwest Muncie, Delaware County, Indiana (Fig. 1). The Cooper-Skinner Field Area is comprised of three adjacent properties: the Cooper Natural Area (not included in this study), the Cooper Woodland Area, and the Skinner Field Area containing Skinner Woods (Fig. 2). The following information comes from documents maintained by the FSEEC and John Taylor, Land Manager of FSEEC (Pers. Comm.); these documents are currently unavailiable to the public pending update of the website.

Cooper Natural Area: The Cooper Natural Area, 23 ha (57 acres), covers the southern portion of the Cooper Property, i.e., from the southern edge of Cooper Woodland south to Bethel Pike (Fig. 2). Prior to 2002 this land was use to grow row crops and hay. Since 2002 most of the land was redirected to the establishment of native prairie vegetation. This section of the Cooper Property was not included in the current study.

Cooper Woodland Area: This woodland has two units that differ in land use history, current legal ownership, and dates of acquisition. Ball State University (for the Department of Biology) acquired ownership of the Esther L. Copper and Dr. Robert H. Copper's Memorial Woodland Area in 1969. The area covers 13 ha (31.5 acres), divided into Cooper Woods (7 ha; east side), an early succession area (6 ha) containing wildlife plantings and natural vegetation (west side; Fig. 2). Eagle Branch, a tributary of Jakes Creek, begins on the eastern edge of this woodland and flows west and north through the woodland.

Skinner Field Area: This land was donated to Ball State University by William (Bill) Skinner in 2002. Lying north of the Cooper property, the Skinner Field Area is composed of 19 ha (47 acres; Fig. 2). The Skinner Woodland Area, which contains both a woodland and a 6 ha (15 acres) old-field, is contiguous with the Cooper Woodland Area (Fig. 2). The woodland at Skinner appears to have a similar structure to Cooper Woodland, having both a more mature area and an earlier successional area. The successional area includes a small woodland and a larger old-field. Overall, the Skinner woodland is drier than the Cooper woodland.

Site characteristics.—The Cooper-Skinner Field Area drains into Eagle Branch, a tributary of Jakes Creek. Jakes Creek flows west to Killbuck Creek, which flows south eventually emptying into the White River. Thus, the Cooper-Skinner Field Area lies within the Upper White River Watershed (USGS Cataloging Unit: 05120201; USGS 2017).

Cooper-Skinner Field Area lies near the northern border of the Tipton Till Plain Section or the New Castle Till Plains and Drainageways (IUPUI 2013), of the Central Till Plain Region of Indiana (Homoya et al. 1985; Hedge et al. 1997). The Tipton Till Plain is a flat to gently rolling surface produced as a result of the continental glaciation during the Ice Age, particularly the Wisconsinan glacial age (Hedge et al. 1997). As the ice sheets retreated, a thick layer of till and outwash filled the bedrock valleys and covered the bedrock hills producing a flat to gently rolling landscape (Hedge et al. 1997; Hill 2015), as seen in the study site.

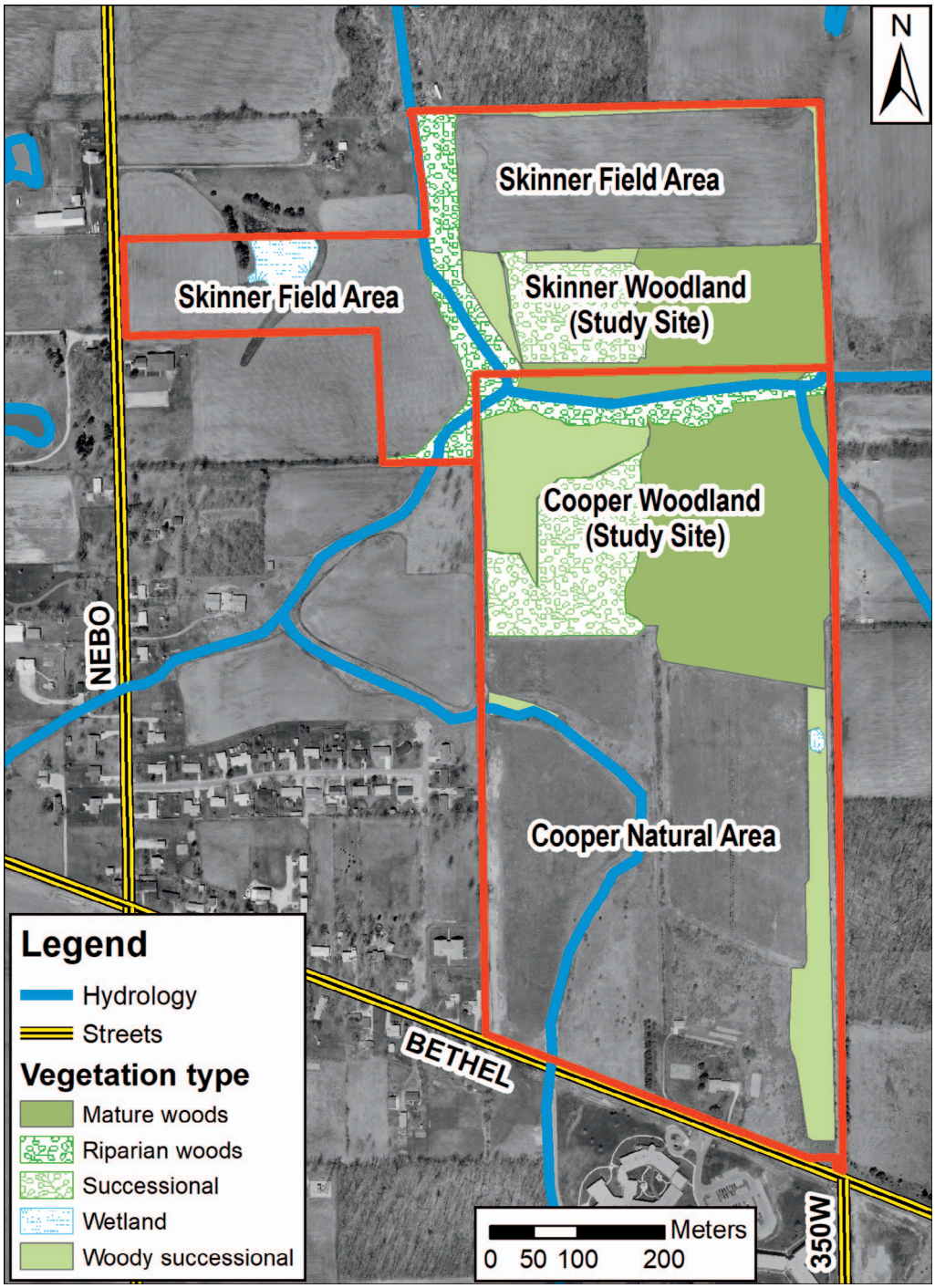

Figure 2.—Modified aerial overview of the Cooper and Skinner Field Areas with emphasis on vegetational communities. Cooper Field Area includes the Cooper Natural Area, not included in this study, and the Cooper Woodland highlighted in color. The Skinner Field Area includes the Skinner Woodland highlighted in color. (Figure courtesy of John Taylor, Land Manager of FSEEC.)

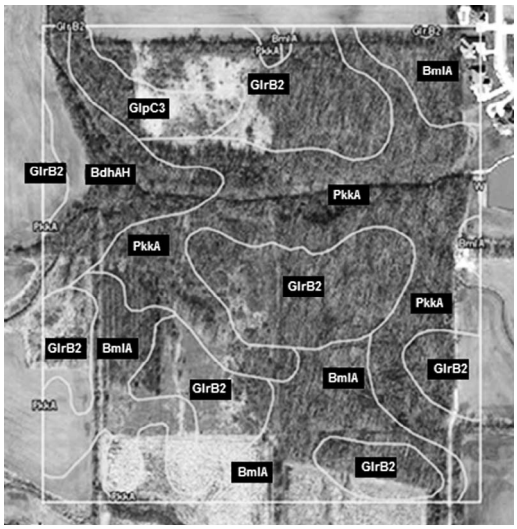

Figure 3.—Map illustrating the distribution of the major soil types at the Cooper Woods – Skinner Woods complex. BdhAH = Bellcreek silty clay loam; BmlA = Blount-Del Rey silty loams; GlpC3 = Glynwood clay loam; GlrB2 = Glynwood silty loam; PkkA = Pewamo silty clay loam. (From WWS 2017)

The soil at Cooper-Skinner consists primarily of silt loams, clay loams, and silty clay loam (WSS 2017). The three groups comprising approximately 89% of the soil at the site are Glynwood silt loam, Pewamo silty clay loam, and Blount-Del Rey silt loam (Fig. 3). Glynwood silt loam has a 1–4 % slope, is moderately well drained, and is considered prime farmland. Pewamo silty clay loam has a 0–1 % slope, is poorly drained, and is considered prime farmland if drained. Blount-Del Rey silt loam has 0–1 % slope, is somewhat poorly drained, and is considered prime farmland if drained.

HISTORY OF THE SITE

The Cooper Property.—In 1951, the Cooper's purchased the land comprising the current Cooper Woodland and Cooper Natural Area as part of a 50 ha (123.3 acre) farm. In 1957 at the request of the Cooper family, the USDA Soil Conservation Service (SCS) designed a management plan to help drain water from the farm. In 1958 an SCS-engineered waterway (drainage ditch) was constructed along the west edge of the property that drained water into Eagle Branch. Beginning in 1959, the northern part of the Cooper property, including the woodland, was placed in the USDA Soil Reserve Program for a period of five years. The Coopers cleared 610 m of footpaths in the woods in 1960. Between 1961 and 1962, timber, especially white oak (*Quercus alba*), was harvested from the woods, but a number of large mature trees remained. In addition, wildlife plantings were established in the springs of 1971, 1972, and 1974 in the area designated as the successional area today. The wildlife plantings included many exotic and invasive herbs and shrub species, such as autumn olive (*Elaeagnus umbellata*), sericea lespedeza (*Lespedeza cuneata*), and reed canary grass (*Phalaris arundinacea*). In 1993, trail clearing in the wooded section ended and in 2004, most of the exotic wildlife plantings were removed. Lastly, the establishment of a native prairie began in the old fields of the Cooper property that comprise today's Cooper Natural Area, i.e., the southern two-thirds of the Cooper property. Prairie maintenance continues today.

The Skinner Field Area.—Ball State University received this parcel of land as a donation from William (Bill) Skinner in 2002. The Skinner Field Area was mainly used for environmental education by Ball State students taking Natural Resources and Environmental Management 101. Currently, there are limited access points to the Skinner Field Area from the Cooper Property.

MATERIALS AND METHODS

During the 2015 growing season [March through October], thirty-two forays were made into the study area; forays were made into the three major habitat types: old-fields, successional woodlands, and mature woodlands (Fig. 2). In addition an effort was made to cover the various microhabitats within these major habitats.

Voucher specimens for each species were collected and deposited in the Ball State University Herbarium (BSUH). Notes on vegetation consisted of a species list with visual estimates of distribution and relative abundance (see catalog of vascular plants, Appendix 1). Relative abundance for species is defined as follows: rare = < 5 sites although a species may be abundant at one site; infrequent = occasional, not widespread throughout its potential habitats, but may be locally abundant at a site; frequent = common throughout its potential habitats and may be locally abundant at one or more sites; and

abundant = common and numerous throughout its potential habitats.

Nomenclature follows the Angiosperm Phylogeny Group (FNA 2008; Angiosperm Phylogeny Group 2009; Stevens 2016). List preparation and sources used to identify plant taxa included Deam (1940), Gleason & Cronquist (1991), Swink & Wilhelm (1994), Yatskievych 2000, Jackson (2004), Weeks et al. (2005), Voss & Reznicek (2012), Weakley et al. (2012), BONAP (2014), and USDA (2017).

Using the program developed by the Conservation Design Forum in conjunction with Rothrock (2004), the Floristic Quality Index (FQI) and the mean Coefficient of Conservatism (mean C) were determined not only for Cooper Woods and Skinner Woods individually, but for the two sites combined. The program also generates a detailed physiognomic analysis of the flora, both native and exotic. For a detailed description of FQI and an explanation of C-values, see Swink & Wilhelm (1994), Rothrock (2004), and Rothrock & Homoya (2005).

Potential Delaware County plant species records were determined from the following sources: Indiana Natural Heritage Data Center's records for Delaware County (available from the Indiana Division of Nature Preserves), Deam (1940), Overlease & Overlease (2007), BONAP (2014), USDA Plant Database (USDA 2017), and the list of species published for Ginn Woods (Ruch et al. 1998, 2004), Munsee Woods Nature Preserve (Prast et al. 2013), and Dutro Woods Nature Preserve (Ruch et al. 2014b). State listed species, i.e., endangered, rare threatened, or of special concern, were determined from the list provided by the Indiana Division of Nature Preserves (IDNR Nature Preserves 2016).

RESULTS

Floristic quality of Cooper Woods and Skinner Woods combined.—The vascular flora of Cooper Woods-Skinner Woods (CW-SW) combined consisted of 356 taxa representing 225 genera in 90 families. Thirty-nine families had only one species and 14 families had only two species. The 12 families with the highest number of taxa were Poaceae (45 spp., 12.6%), Asteraceae (38 spp., 10.6%), Cyperaceae (28 spp., 7.9%), Rosaceae (20 spp., 5.6%), Fabaceae (11 spp., 3.1%), Brassicaceae (9 spp., 2.5%), Fagaceae (9 spp., 2.5%), Lamiaceae (9 spp., 2.5%), Apiaceae (7 spp., 2.0%), Asparagaceae (7 spp., 2.0%), Polygonaceae (7 spp., 2.0%), and Ranunculaceae (7 spp., 2.0%); these 12 families contained 197 (55.3%) of the 356 taxa documented (Appendix 1).

Table 1.—Physiognomic analysis of the vascular flora documented in Cooper Woods and Skinner Woods combined, Delaware County, Indiana. A = annual, B = biennial, H = herbaceous, P = perennial, W = woody. * = % of total = native plus non-native species.

	Native species summary		Exotic species summary	
	Number	% of Total*	Number	% of Total*
# of species	276	77.5%	80	22.5%
Tree	43	12.1%	6	1.7%
Shrub	14	3.9%	7	2.0%
W-Vine	6	1.7%	1	0.3%
H-Vine	3	0.8%	0	0.0%
P-Forbs	115	32.3%	23	6.5%
B-Forbs	5	1.4%	9	2.5%
A-Forbs	34	9.6%	13	3.7%
P-Grass	19	5.3%	9	2.5%
A-Grass	5	1.4%	12	3.4%
P-Sedge	28	7.9%	0	0.0%
A-Sedge	1	0.3%	0	0.0%
Ferns & Allies	3	0.8%	0	0.0%

The physiognomic summary of the flora in CW-SW is presented in Table 1. Of the 356 taxa documented, 276 (77.5%) were native species and 80 (22.5%) were non-native species. Of the 356 total taxa, 77 (21.6) species were woody (e.g., trees, shrub, woody vines), 202 (56.8%) species were forbs and herbaceous vine, 74 (20.8) species were graminoid (e.g., grasses and sedges), and three (0.8%) species were ferns or fern allies (Table 1).

The Floristic Quality Index (FQI) and mean C for the combined CW-SW complex are listed in Table 2. For the combined native flora in both sites, the FQI and mean C was 55.0 and 3.4, respectively, and the FQI and mean C for total species (native and non-native) was 48.6 and 2.6, respectively.

Floristic quality Cooper Woods.—The vascular flora of Cooper Woods (CW) consisted of 332 taxa representing 214 genera in 85 families. The ten families with the highest number of taxa were Poaceae (42 spp., 12.7%), Asteraceae (38 spp., 11.5%), Cyperaceae (25 spp., 7.5%), Rosaceae (19 spp., 5.7%), Fabaceae (11 spp., 3.3%), Fagaceae (9 spp., 2.7%), Lamiaceae (9

Table 2.—Floristic quality matrices for Cooper Woods and Skinner Woods combined and separate, Delaware County, Indiana. All species = native species + non-native species.

Site	Number of species	FQI	Mean C
Cooper + Skinner Combined			
Native species	276	55.0	3.4
All species	356	48.6	2.6
Cooper Woods Only			
Native species	255	51.9	3.2
All species	332	45.4	2.5
Skinner Woods Only			
Native species	222	47.6	3.2
All species	272	43.0	2.6

spp., 2.7%), Apiaceae (7 spp., 2.1%), Polygonaceae (7 spp., 2.1%), and Ranunculaceae (7 spp., 2.1%). These ten families contained 174 (52.4%) of the 332 taxa documented (Appendix 1).

The physiognomic summary of the flora in CW is listed in Table 3. Of the 332 taxa documented, 255 (76.8%) were native species and 77 (23.2%) were non-native species. Of the 332 total taxa, 73 (22.0%) species were woody (e.g., trees, shrub, woody vines), 190 (57.2%) species were forbs and herbaceous vine, 67 (20.2%) species were graminoid (e.g., grasses and sedges), and two species (0.6%) were ferns or fern allies (Table 3).

Table 3.—Physiognomic analysis of the vascular flora documented in Cooper Woods, Delaware County, Indiana. A = annual, B = biennial, H = herbaceous, P = perennial, W = woody. * = % of total = native plus non-native species.

	Native species summary		Exotic species summary	
	Number	% of Total*	Number	% of Total*
# of species	255	76.8%	77	23.2%
Tree	41	12.3%	6	1.8%
Shrub	12	3.6%	7	2.1%
W-Vine	6	1.8%	1	0.3%
H-Vine	2	0.6%	0	0.0%
P-Forbs	108	32.5%	23	6.9%
B-Forbs	5	1.5%	9	2.7%
A-Forbs	30	9.0%	13	3.9%
P-Grass	19	5.7%	9	2.7%
A-Grass	5	1.5%	9	2.7%
P-Sedge	24	7.2%	0	0.0%
A-Sedge	1	0.3%	0	0.0%
Ferns & Allies	2	0.6%	0	0.0%

The Floristic Quality Index (FQI) and mean C for CW are recorded in Table 2. For the native flora in CW, the FQI and mean C was 51.9 and 3.2, respectively, and the FQI and mean C for total species (native and non-native) was 45.4 and 2.5, respectively.

Floristic quality Skinner Woods.—The vascular flora of Skinner Woods (SW) consisted of 272 taxa representing 174 genera in 78 families. The ten families with the highest number of taxa were Poaceae (32 spp., 11.8%), Asteraceae (26 spp., 9.6%), Cyperaceae (23 spp., 8.5%), Rosaceae (19 spp., 7.0%), Fabaceae (10 spp., 3.7%), Brassicaceae (9 spp., 3.3%), Fagaceae (7 spp., 2.6%), Lamiaceae (6 spp., 2.2%), Polygonaceae (6 spp., 2.2%), and Juglandaceae (4 spp., 1.5%). These ten families contained 142 (52.2%) of the 272 taxa documented (Appendix 1).

The physiognomic summary of the flora in SW is recorded in Table 4. Of the 272 taxa documented, 222 (81.6%) were native species and 50 (18.4%) were non-native species. Of the 272 total taxa (native and non-native), 60 (22.1%) species were woody (e.g., trees, shrub, woody vines), 152 (55.9%) species were herbaceous forbs or vines, 58 (21.3%) species were graminoid (e.g., grasses

Table 4.—Physiognomic analysis of the vascular flora documented in Skinner Woods, Delaware County, Indiana. A = annual, B = biennial, H = herbaceous, P = perennial, W = woody. * = % of total = native plus non-native species.

	Native species summary		Exotic species summary	
	Number	% of Total*	Number	% of Total*
# of species	222	81.6%	50	18.4%
Tree	34	12.5%	2	0.7%
Shrub	13	4.8%	5	1.8%
W-Vine	6	2.2%	0	0.0%
H-Vine	1	0.4%	0	0.0%
P-Forbs	91	33.5%	14	5.1%
B-Forbs	5	1.8%	6	2.2%
A-Forbs	26	9.6%	9	3.3%
P-Grass	16	5.9%	7	2.6%
A-Grass	4	1.5%	7	2.6%
P-Sedge	23	8.5%	0	0.0%
A-Sedge	1	0.4%	0	0.0%
Ferns & Allies	2	0.7%	0	0.0%

and sedges), and two species (0.7%) were ferns or fern allies.

The FQI and mean C for SW are documented in Table 2. For the native flora in SW, the FQI and mean C was 47.6 and 3.2, respectively, and the FQI and mean C for total species (native and non-native) was 43.0 and 2.6, respectively.

DISCUSSION

Inventory and floristic quality index.—The vascular plant taxa documented in CW and SW were typical of other floristic inventories of vegetation in east-central Indiana (Prast et al. 2013; Rothrock et al. 1993; Rothrock 1997; Ruch et al. 1998, 2002, 2004, 2007, 2008a, b, 2009, 2012, 2014a, b, 2015; Stonehouse et al. 2003, Tungesvick 2011). The twelve most dominant plant families, which include approximaterly 55% of the taxa reported at the CW-SW complex (e.g., 197 of 356 documentated taxa (Apendix 1)) and 53–65% of taxa reported in the studies cited above, were the Apiaceae, Asteraceae, Brassicaceae, Caryophyllaceae, Cyperaceae, Fabaceae, Lamiaceae, Plantaginaceae, Poaceae, Polygonaceae, Ranunculaceae, and Rosaceae.

For the combined woodland complex, the floristic quality index (FQI) for the native flora was 55.0 and the mean C (mean coefficient of conservatism) was 3.4 (Table 2). The FQI and mean C for all plants, native plus non-native, was 48.6 and 2.6, respectively (Table 2). Analysis of these matrices provides an understanding regarding the quality of these sites. Swink & Wilhelm (1994) have suggested that sites with FQIs higher than 35 possess "sufficient conservatism and richness to be of profound importance from a regional perspective." Ruch and collegues have been using a native FQI $\geq$ 45 for designating a site as nature preserve quality. Thus, having a native FQI = 55.0 suggests that the CW-SW woodland complex is of nature preserve quality. However, does the low native mean C contradict this conclusion?

When comparing the FQI and mean C for 28 reference sites in Indiana, Rothrock & Homoya (2005) noted that the best quality woodland sites in the Central Till Plain, whether for historical or for innate biological reasons, have a limited number of species from the highest fidelity categories. They noted that for the best sites the native mean C is in the low 4 range, most sites fall between 3.8–4.1 (Rothrock & Homoya 2005). Our research team has conducted complete inventories for more than 25 sites in east-central Indiana, and approximately a quarter of these have FQIs above 50 and native mean C's below 3.8, such as Wapi-nipi State Nature Preserve, formerly known as Coffman Woods Nature Preserve, (native FQI = 58.4, mean C = 3.5) in Wayne County (Ruch et al. 2014a), Munsee Woods State Nature Preserve (native FQI = 55.0, mean C = 3.2) in Delaware County (Prast et al. 2014), and McVey Memorial Forest (native FQI = 60.0, mean C = 3.5) in Randolph County (unpublished data). It was noted in these studies that the probable reason for the low native mean C was due to the limited number of species from the highest fidelity categories. For example, in the current study of the 276 native taxa documented from the CW-SW complex, only 22 species (8.0%) had C-values $\geq$ 7, while 146 native species (52.9%) had C-values $\leq$ 3 and 108 native species (39.1%) had C-values of 4–6 (Appendix 1). Thus, it is not uncommon for sites in east-central Indiana (such as the CW-SW woodland complex, native mean C = 3.4) with FQIs above 50 to have native mean C values from 3.2–3.8 (see Ruch et al. 2014a).

What explains the pattern of reduced number of species in the highest fidelity categories and is it a historical as well as a contemporary pattern? In support of a historical pattern one might note the rather homogenous substrate and topography of the Tipton Till Plain forests. In the absence of a fen or other wetland supporting conservative species (e.g., Mounds State Park; see Rothrock et al. 1993) or the canyon walls seen in west-central Indiana (Hedge 1997), these woodlands have a limited suite of soil types and only modest differences in microclimates that might encourage a greater richness of conservative species. In the contemporary setting, floristically significant parcels may have fewer conservative species due to the size and setting. Unlike the large woodlands in the southern half of the state, the highest quality woodlands in east-central Indiana are typically small, isolated, and with urbanization, especially agriculture, contiguous with their borders. The small size results in woodlands having limited core as opposed to edge areas, altering patterns of species distributions and abundances (Whitney & Runkle 1981; Kupfer 1997). At the same time urbanization and agriculture create constant anthropogenic pressures resulting in changes in abiotic factors such as hydrological and nutrient cycles and biotic impact from herbivory and

introduced species (McKnight 1993; Honnay et al. 2002; Faulkner 2004; McKinney 2008).

In summary based on the native FQI and mean C, the CW-SW woodland complex is of nature preserve quality and does possess "sufficient conservatism and richness to be of profound importance from a regional perspective" as described by Swink & Wilhelm (1994). This woodland complex is an example of the highest quality woodland in central Delaware County.

Determining the floristic quality of a site typically entails first calculating the site's metrics with only native species and then with all species, native and non-native. The difference between these can be used to document the impact that exotic species are having upon the site. Rothrock & Homoya (2005) have suggested that the natural quality of a site has been compromised when non-native diversity lowers the mean C by more than 0.7 units. In the CW-SW complex, the mean C was lowered 0.8 units. Thus, it can be presumed that the non-native flora is having a negative impact on the native flora. However, it should be pointed out that one cannot rely completely on the difference between the mean C-values when assessing the affect of the non-native species. In addition visual assessments must be included. A visual examination of the CW-SW complex revealed that the diversity of non-native species was concentrated on the margins of the site or in successional communities, such as old fields, that were only a part of the overall property. The interior woodlands at both sites contained very few species, or even total numbers, of non-natives. Similar observations were reported previously at Botany Glen (Stonehouse et al. 2003), Fall Creek Gorge (Rothrock & Homoya (2005), Ginn Woods (Ruch et al. 1998, 2004), Mounds State Park (Rothrock et al. 1993; Tungesvick 2011), and Lick Creek Summit Nature Preserve (Ruch et al. 2008a). In all these studies, even though the non-native species lowered mean C by at least 0.8 units, all reported that the integrity of the sites was not compromised. It is best summarized by Rothrock & Homoya (2005), "this amount of 'exotics load,' while of concern, may not be sufficient to detract from the preservation potential of a site."

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APPENDIX 1

CATALOG OF VACULAR FLORA AT COOPER WOODS AND SKINNER WOODS, DELAWARE COUNTY, INDIANA

(Arranged alphabetically by family in each phylum and class)

Species are listed alphabetically by family, then genera, under major plant groups. Non-native (exotic) species are capitalized. Nomenclature follows the Angiosperm Phylogeny Group III (APG 2009; Stevens 2015). Each species report contains the following information: (1) current scientific name; (2) location (CW = Cooper Woods, SW = Skinner Woods); (3) vegetation association (CB = creek bank, MWL = mature woodland, OF = old-field, SUCWL = early successional woodland, VP = vernal pool, and WE = woodland edge); (4) a visual estimate of its relative abundance (see below); (5) the Indiana Coefficient of Conservation, C-value (Rothrock 2004); and (6) the Ball State University Herbarium (BSUH) number(s). The relative abundance for species is defined as follows; rare = $\leq$ 5 sites although a species may be abundant at one site; infrequent = occasional, not widespread throughout its potential habitats, but may be locally abundant at a site; common = frequent throughout its potential habitats and may be locally abundant at one or more sites; and abundant = common and numerous throughout its potential habitats. Potential Delaware County records are indicated by a pound-symbol in parentheses (#) immediately preceding a species. There are five Delaware County records. Species were deemed unreported for Delaware County, and hence considered a county record, if they did not appear in the Indiana Natural Heritage Data Center's records for Delaware County [this is the same plant list in the computer database of Keller et al. (1984)], the USDA Plant Database (2017), The Biota of North America Program (BONAP): Maps by States and Provinces (2014), Overlease & Overlease (2007), Deam (1940), the species listed at Dutro Woods Nature Preserve (Ruch et al.

2014b), Ginn Woods (Ruch et al. 1998, 2004), and Munsee Woods Nature Preserve (Prast et al. 2013). Lastly, no species documented at CW-SW occur on the Indiana Department of Natural Resources list of endangered, threatened or rare plants, but two species, *Rudbeckia fulgida* var. *fulgida* and *Spiranthes ovalis* var. *erostellata*, are on the state watch list (IDNR Nature Preserves 2016).

MONILOPHYTA

CYSTOPTERIDACEAE

Cystopteris protrusa (Weath.) Blasdell – CW, SW; MWL, SUCWL; Common; C = 4; BSUH 19775, 19667.

EQUISETACEAE (Horsetail Family)

Equisetum arvense L. – CW; MWL; Rare; C = 1; BSUH 20050.

OPHIOGLOSSACEAE (Adder's-tongue Family)

Sceptridium dissectum (Spreng.) Lyon forma *obliquum* – SW; MWL- near trash pile; Rare; C = 3; BSUH 19990.

CONIFEROPHYTA

CUPRESSACEAE (Redwood or Cypress Family)

Juniperus virginiana L. var. *virginiana* – CW, SW; OF; Rare; C = 2; BSUH 19549.

PINACEAE (Pine Family)

PINUS RESINOSA Aiton – CW; SUCWL; Rare; C = 0; BSUH 19953.

Pinus strobus L. – CW; WE, SUCWL; Rare; C = 5; BSUH 19703.

PINUS SYLVESTRIS L. – CW; WE; Rare; C = 0; BSUH 19944, 19484.

MAGNOLIOPHYTA

MAGNOLIOPSIDA (Dicotyledons)

ACANTHACEAE (Acanthus Family)

Ruellia strepens L. – CW, SW; MWL, WE; Common; C = 4; BSUH 20037.

ADOXACEAE (Moschatel Family)

Sambucus canadensis L. – CW, SW; MWL; Infrequent; C = 2; BSUH 20035.

AMARANTHACEAE (Goosefoot or Pigweed Family)

AMARANTHUS RETROFLEXUS L. – CW; WE/OF; Infrequent but locally common; C = 0; BSUH 20068.

Amaranthus tuberculatus (Moquin-Tandon) J.D. Sauer – CW; CB, WE/OF; Infrequent; C = 1; BSUH 19884.

CHENOPODIUM ALBUM L. – CW, SW; OF, WE, SUCWL, VP; Infrequent; C = 0; BSUH 20054.

ANACARDIACEAE (Cashew Family)

Toxicodendron radicans (L.) Kuntze var. *negundo* (Greene) Reveal – CW, SW; All habitats; Common; C = 1; BSUH 20049.

ANNONACEAE (Custard apple Family)

Asimina triloba (L.) Dunal – CW; SUCWL; Rare; C = 6; BSUH 19989.

APIACEAE (Carrot or Parsley Family)

Cryptotaenia canadensis (L.) DC. – CW, SW; MWL; Abundant; C = 3; BSUH 20046.

DAUCUS CAROTA L. – CW, SW; WE, OF; Rare; C = 0; BSUH 19733.

Erigenia bulbosa (Michx.) Nutt. – CW, SW; MWL; Infrequent; C = 5; BSUH 19742.

Osmorhiza claytonii (Michx.) C.B. Clarke – CW, SW; MWL; Common; C = 3; BSUH 20009.

Sanicula odorata (Raf.) K.M. Pryer & L.R. Phillippe – CW, SW; MWL; Common and locally abundant; C = 2; BSUH 19995.

Thaspium trifoliatum (L.) A. Gray var. *aureum* (L.) Britton – CW, SW; MWL; C = 5; BSUH 20019.

Zizia aurea (L.) W.D.J. Koch – CW; WE; C = 7; BSUH 20010.

APOCYNACEAE (Dogbane and Milkweed Family)

Apocynum cannabinum L. – CW, SW; OF, WE; Infrequent; C = 2; BSUH 19772.

Asclepias incarnata L. var. *incarnata* – CW, SW; CB near pond; Rare; C = 4; BSUH 19734.

Asclepias syriaca L. – CW, SW; WE/OF; C = 1; BSUH 19751.

ARISTOLOCHIACEAE (Birthwort Family)

Aristolochia serpentaria L. (= *Endodeca serpentaria* (L.) Raf.) – CW; MWL; Rare; C = 8; BSUH 19786.

ASTERACEAE (Aster or Sunflower Family)

Ageratina altissima (L.) R.M. King & H. Rob. var. *altissima* – CW; MWL; Rare; C = 2; BSUH 19074, 19718.

Ambrosia artemisiifolia L. var. *elatior* (L.) Descourt. – CW, SW; OF, SUCWL; Infrequent ; C = 0; BSUH 19708.

Ambrosia trifida L. – CW, SW; MWL; Infrequent but locally common; C = 0; BSUH 20061.

Bidens bipinnata L. – CW; WE/OF; Rare; C = 0; BSUH 19722, 19821.

Bidens frondosa L. – CW, SW; MWL; Infrequent; C = 1; BSUH 20065.

Bidens vulgata Greene – CW; MWL, SUCWL; Common and locally abundant; C = 0; BSUH 19832.

CICHORIUM INTYBUS L. – CW, SW; WE, OF; Rare; C = 0; BSUH 19767.

CIRSIUM ARVENSE (L.) Scop. – CW, SW; OF, WE; C = 0; BSUH 19770.

Cirsium discolor (Muhl. ex Willd.) Spreng. – CW, SW; OF; Infrequent; C = 3; BSUH 20064.

Conyza canadensis (L.) Cronquist var. *canadensis* – CW, SW; OF, WE; Common; C = 0; BSUH 19706.

Erechtites hieraciifolius (L.) Raf. ex DC. – CW; SUCWL; Rare; C = 2; BSUH 19817.

Erigeron annuus (L.) Pers. – CW, SW; MWL; Infrequent; C = 0; BSUH 20047.

Erigeron philadelphicus L. var. *philadelphicus* – CW, SW; MWL; Infrequent; C = 3; BSUH 19997.

Eupatorium altissimum L. – CW, SW; OF; Common; C = 1; BSUH 19714.

Eupatorium perfoliatum L. – CW; SUCWL; Rare; C = 4; BSUH 20059.

Eupatorium serotinum Michx. – CW, SW; WE, OF; Common; C = 0; BSUH 19723.

Euthamia graminifolia (L.) Nutt. – CW, SW; OF; Common; C = 3; BSUH 20058.

Helianthus decapetalus L. – CW; WE, MWL; Infrequent; C = 5; BSUH 19827, 19874.

Helianthus tuberosus L. – CW; WE, MWL; Rare but locally common; C = 2; BSUH 19826.

Lactuca floridana (L.) Gaerth. – CW, SW; MWL, SUCWL; Infrequent; C = 5; BSUH 20062.

LACTUCA SERRIOLA L. – CW; WE; Rare; C = 0; BSUH 19715.

Packera glabella (Poir.) C. Jeffrey – CW, SW; MWL, WE; Infrequent; C = 0; BSUH 19994.

Packera obovata (Willd.) W.A. Weber & Á. Löve – CW, SW; MWL; Common; C = 7; BSUH 19803.

Ratibida pinnata (Vent.) Barnhart – CW; OF; Rare; C = 5; BSUH 19798.

(#) *Rudbeckia fulgida* Aiton var. *fulgida* – CW; MWL; Infrequent but locally common; C = 5; BSUH 19843. (State Watch List; S2 = imperiled in state)

Rudbeckia hirta L. – CW, SW; OF, SUCWL; Common; C = 2; BSUH 19795.

Rudbeckia triloba L. var. *triloba* – CW; WE; Rare; C = 3; BSUH 19878.

Solidago altissima L. – CW, SW; OF, SUCWL, WE; Abundant; C = 0; BSUH 19719.

Symphyotrichum cordifolium (L.) G.L. Nesom – CW, SW; MWL, WE; Common; C = 5; BSUH 19823.

Symphyotrichum lanceolatum (Willd.) G.L. Nesom var. *lanceolatum* – CW; OF (west ditch bank); Rare; C = 3; BSUH 20067.

Symphyotrichum lateriflorum (L.) Á. Löve & D. Löve var. *lateriflorum* – CW, SW; All habitats; Abundant; C = 3; BSUH 19717.

Symphyotrichum novae-angliae (L.) G.L. Nesom – CW, SW; OF; Common; C = 3; BSUH 19738.

Symphyotrichum pilosum (Willd.) G.L. Nesom var. *pilosum* – CW, SW; OF; Common; C = 0; BSUH 19716.

TARAXACUM OFFICINALE G.H. Weber ex F.H. Wiggers – CW, SW; CB, OF, MWL, WE; Infrequent; C = 0; BSUH 19690.

TRAGOPOGON PRATENSIS L. – CW, MWL, Rare C = 0; BSUH 20025.

Verbesina alternifolia (L.) Britton ex Kearney – CW, SW; SUCWL, WE; Infrequent; C = 3; BSUH 19986.

Vernonia gigantea (Walter) Trel. – CW, SW; OF; Common; C = 2; BSUH 19701.

Xanthium strumarium L. – CW, SW; OF, WE; Rare; C = 0; BSUH 19837.

BALSAMINACEAE (Touch-me-not Family)

Impatiens capensis Meerb. – CW, SW; MWL, SUCWL; Abundant; C = 2; BSUH 19756.

BERBERIDACEAE (Barberry Family)

Jeffersonia diphylla (L.) Pers. – CW; MWL; Rare but locally abundant; C = 7; BSUH 19688.

Podophyllum peltatum L. – CW, SW; MWL; Abundant; C = 3; BSUH 19765.

BETULACEAE (Birch Family)

Carpinus caroliniana Walter ssp. *virginiana* (Marshall) Furlow – CW, SW; MWL; Infrequent; C = 5; BSUH 20041.

Corylus americana Walter – SW; MWL; Rare; C = 4; BSUH 19813.

Ostrya virginiana (Mill.) K. Koch – CW, SW; MWL; Common; C = 0; BSUH 20042.

BIGNONIACEAE (Trumpet-Creeper Family)

Catalpa speciosa (Warder) Engelm. – CW; SUCWL; Rare; C = 0; BSUH 19984.

BORAGINACEAE (Borage Family)

Hackelia virginiana (L.) I.M. Johnst. – CW, SW; MWL; Rare; C = 0; BSUH 19791.

Mertensia virginica (L.) Link – CW, SW; MWL; Rare; C = 6; BSUH 19678.

BRASSICACEAE (Mustard Family)

ALLIARIA PETIOLATA (M. Bieb.) Cavara & Grande – CW, SW; MWL; Infrequent; C = 0; BSUH 19692.

BARBAREA VULGARIS W.T. Aiton – CW, SW; OF, SUCWL; Infrequent; C = 0; BSUH 19806.

Cardamine bulbosa (Schreb. ex Muhl.) Britton, Sterns & Poggenb. – CW, SW; MWL, SUCWL; Common; C = 4; BSUH 19693.

Cardamine concatenata (Michx.) O. Schwarz – CW, SW; MWL; Abundant; C = 4; BSUH 19750.

Cardamine douglassii Britton – CW, SW; MWL; Common; C = 5; BSUH 19694.

(#) *Cardamine parviflora* L. var. *arenicola* (Britton) O.E. Schulz – SW; WE/OF; Common; C = 4; BSUH 19863.

Cardamine pensylvanica Willd. – CW, SW; MWL; Rare; C = 2; BSUH 19777.

Rorippa palustris (L.) Besser ssp. *fernaldiana* (Butters & Abbe) Jonsell – CW, SW; OF, WE; Rare but locally frequent; C = 2; BSUH 19920.

Rorippa sessiliflora (Nutt.) A.S. Hitchc. – SW; WE/OF; Infrequent; C = 3; BSUH 19864.

CAMPANULACEAE (Bellflower Family)

Campanula americana L. (= *Campanulastrum americanum* (L.) Small) – CW; MWL; Rare; C = 4; BSUH 19957.

Lobelia inflata L. – CW, SW; MWL, OF, WE; Common and locally abundant; C = 3; BSUH 19705, 19861.

Lobelia siphilitica L. – CW, SW; WE; Common; C = 3; BSUH 19705.

CAPRIFOLIACEAE (Honeysuckle Family)

LONICERA MAACKII (Rupr.) Maxim. – CW, SW; MWL; Abundant; C = 0; BSUH 19675.

LONICERA MORROWII A. Gray – CW, SW; OF; Common; C = 0; BSUH 19941.

Triosteum aurantiacum E.P. Bicknell var. *aurantiacum* – SW; MWL; Rare; C = 5; BSUH 19812.

VIBURNUM OPULUS var. *OPULUS* – CW, SW; MWL; Infrequent; C = 0; BSUH 19993.

Viburnum prunifolium L. – CW, SW; MWL; Common and locally abundant; C = 4; BSUH 19800, 19663.

CARYOPHYLLACEAE (Pink Family)

CERASTIUM FONTANUM Baumg. ssp. *VULGARE* (Hartm.) Greuter & Burdet – CW, SW; OF; Abundant; C = 0; BSUH 19938, 20005.

DIANTHUS ARMERIA L. – CW; MWL; Rare; C = 0; BSUH 20052.

Silene stellata (L.) W.T. Aiton – CW, SW; MWL; Rare but locally common; C = 5; BSUH 19959.

Silene virginica L. – CW, SW; MWL; Rare; C = 7; BSUH 19980.

STELLARIA MEDIA (L.) Vill. – CW; SUCWL, WE; C = 0; BSUH 20069.

CELASTRACEAE (Bittersweet Family)

CELASTRUS ORBICULATUS Thunb. – CW; MWL; Infrequent [to rare]; C = 0; BSUH 20036.

Euonymus atropurpureus Jacq. var. *atropurpureus* – CW, SW; MWL; Infrequent; C = 5; BSUH 19696.

Euonymus obovata Nutt. – CW, SW; MWL; Common; C = 0; BSUH 19797.

CONVOLVULACEAE
(Morning-Glory Family)

Calystegia sepium (L.) R. Br. – CW, SW; MWL, WE; Infrequent but locally common; C = 1; BSUH 19769.

IPOMOEA HEDERACEA Jacq. – CW; WE; Rare; C = 0; BSUH 20063.

CORNACEAE (Dogwood Family)

Cornus drummondii C.A. Mey. – CW, SW; MWL/WE; Common; C = 2; BSUH 19983.

Cornus obliqua Raf. – CW; OF, SUCWL; Infrequent; C = 5; BSUH 19882.

DIPSACACEAE

DIPSACUS FULLONUM L. – CW, SW; OF, SUCWL, WLE; Infrequent; C = 0; BSUH 19965.

ELAEAGNACEAE (Oleaster Family)

ELEAGNUS UMBELLATA Thunb. – CW, SW; OF, WE; Infrequent; C = 0; BSUH 20004.

EUPHORBIACEAE (Spurge Family)

Acalypha rhomboidea Raf. – CW, SW; All habitats; Abundant; C = 0; BSUH 19828.

Euphorbia dentata Michx. – CW; WE; Rare; C = 0; BSUH 19815.

Euphorbia maculata L. – CW; OF, WE; Rare; C = 0; BSUH 19699.

Euphorbia nutans Lag. – CW, SW; OF; Infrequent; C = 0; BSUH 19814.

FABACEAE (Legume Family)

Cercis canadensis L. – CW, SW; MWL, SUCWL; Infrequent; C = 3; BSUH 19684, 19808.

Desmodium canadense (L.) DC. – CW, SW; OF; Infrequent but locally common; C = 3; BSUH 19834.

Desmodium paniculatum (L.) DC. var. *paniculatum* – CW, SW; OF; Infrequent to common in the fields; C = 2; BSUH 19713.

Gleditsia triacanthos L. – CW, SW; MWL; Rare to infrequent; C = 1; BSUH 19937.

(#) *LATHYRUS LATIFOLIUS* L. – CW; OF; Rare; C = 0; BSUH 19793.

MEDICAGO LUPULINA L. – CW, SW; MWL, SUCWL; Rare; C = 0; BSUH 20039.

MELILOTUS OFFICINALIS (L.) Lam. – CW, SW; MWL, WE; Infrequent but locally common; C = 0; BSUH 19782.

SECURIGERA VARIA (L.) Lassen – CW; OF; Rare; C = 0; BSUH 20057.

TRIFOLIUM HYBRIDUM L. – CW, SW; OF, SUCWL, WE; Common; C = 0; BSUH 20038.

TRIFOLIUM PRATENSE L. – CW, SW; OF, SUCWL, WE; Common; C = 0; BSUH 19763.

TRIFOLIUM REPENS L. – CW, SW; OF; Infrequent; C = 0; BSUH 19982.

FAGACEAE (Beech Family)

Fagus grandifolia Ehrh. – CW, SW; MWL; Infrequent; C = 8; BSUH 20028.

Quercus bicolor Willd. – CW, SW; MWL; Infrequent; C = 7; BSUH 19730, 19973.

Quercus imbricaria Michx. – CW; MWL, WE; Rare; C = 3; BSUH 19726.

Quercus macrocarpa Michx. var. *macrocarpa* – CW, SW; MWL, WLE; Abundant; C = 5; BSUH 19663.

Quercus muehlenbergii Engelm. – CW, SW; SUCWL; Infrequent; C = 4; BSUH 20012.

Quercus palustris Münchh. – CW, SW; MWL; Rare; C = 3; BSUH 20027.

Quercus rubra L. – CW, SW; MWL; Abundant; C = 4; BSUH 19974.

Quercus shumardii Buckley – CW, SW; MWL; Abundant; C = 7; BSUH 19975.

Quercus velutina Lam. – CW; MWL; Rare; C = 4; BSUH 19819.

FUMARIACEAE (Fumitory Family)

Dicentra cucullaria (L.) Bernh. – CW, SW; MWL; Infrequent; C = 6; BSUH 19744.

GERANIACEAE (Geranium Family)

Geranium maculatum L. – CW, SW; MWL; Common; C = 4; BSUH 19781.

GROSSULARIACEAE (Gooseberry Family)

Ribes cynosbati L. – CW, SW; MWL; Infrequent; C = 4; BSUH 19801.

HYPERICACEAE (St. John's-wort Family)

Hypericum mutilum L. – SW; WE/OF; Infrequent but locally common; C = 4; BSUH 19709.

HYPERICUM PERFORATUM L. – CW, SW; MWL; Rare C = 0; BSUH 19784.

Hypericum punctatum Lam. – CW, SW; OF; Common; C = 3; BSUH 19729.

HYDROPHYLLACEAE (Waterleaf family)

Hydrophyllum macrophyllum Nutt. – CW, SW; MWL; Rare; C = 7; BSUH 19996.

Hydrophyllum virginianum L. – CW, SW; MWL; Abundant; C = 4; BSUH 19999.

JUGLANDACEAE (Walnut Family)

Carya cordiformis (Wangenh.) K. Koch – CW, SW; MWL; Infrequent; C = 5; BSUH 19787.

Carya glabra (P. Miller) Sweet – CW, SW; MWL; Infrequent; C = 4; BSUH 19788.

Carya laciniosa (Michx. f.) G. Don – CW, SW; MWL; Abundant; C = 8; BSUH 19846.

Carya ovata (P. Miller) K. Koch – CW, SW; MWL, SUCWL; Common; C = 4; BSUH 19960.

Juglans nigra L. – CW, SW; MWL, SUCWL, WE; Infrequent to common C = 2; BSUH 20013.

LAMIACEAE (Mint Family)

Blephilia hirsuta (Pursh) Benth. – CW, SW; MWL; Rare but locally common; C = 5; BSUH 19905, 19724.

(#) *CHAITURUS MARRUBIASTRUM* (L.) Rchb. – CW; WE; Rare but locally common; C = 0; BSUH 19721, 19876.

GLECHOMA HEDERACEA L. – CW, SW; MWL; Rare; C = 0; BSUH 19761.

Lycopus americanus Muhl. ex W.P.C. Barton – CW, SW; CB, OF; Common to abundant; C = 3; BSUH 19704.

Monarda fistulosa L. var. *fistulosa* – CW; OF; Infrequent; C = 3; BSUH 19792.

PRUNELLA VULGARIS L. – CW, SW; OF, SUCWL; Common; C = 0; BSUH 19736.

Scutellaria lateriflora L. – CW, SW; MWL, VP; Common; C = 4; BSUH 19789.

Stachys tenuifolia Willd. – CW; MWL, VP; Common; C = 4; BSUH 19880, 19954.

Teucrium canadense L. – CW, SW; MWL, WE; Infrequent but locally common; C = 3; BSUH 19735.

LAURACEAE (Laurel Family)

Lindera benzoin (L.) Blume var. *benzoin* – CW, SW; WE, VP; Rare; C = 5; BSUH 19683, 19711.

LIMNANTHACEAE (False Mermaid Family)

Floerkea proserpinacoides Willd. – CW; MWL; Common; C = 5; BSUH 19691.

LINDERNIACEAE (False Pimpernel Family)

Lindernia dubia (L.) Pennell var. *anagallidea* (Michx.) Cooperr. – CW, SW; OF; Rare but locally frequent; C = 3; BSUH 19727.

MAGNOLIACEAE (Magnolia Family)

Liriodendron tulipifera L. – CW; OF, SUCWL; Rare; C = 4; BSUH 19697.

MALVACEAE (Mallow Family)

ABUTILON THEOPHRASTI Medik. – CW, SW; OF (disturbed soil near soil pit), WE; Rare; C = 0; BSUH 19702, 19720.

HIBISCUS TRIONUM L. – CW, SW; WE, CB near pond; Rare; C = 0; BSUH 19707, 19839.

SIDA SPINOSA L. – CW, SW; OF, WE; Rare; C = 0; BSUH 19879.

Tilia americana L. var. *americana* – CW; MWL; Rare but locally frequent; C = 5; BSUH 19820.

MENISPERMACEAE (Moonseed Family)

Menispermum canadense L. – CW, SW; MWL; Common; C = 3; BSUH 19670.

MONTIACEAE (Blinks Family)

Claytonia virginica L. var. *virginica*– CW, SW; MWL; Abundant; C = 2; BSUH 19749.

MORACEAE (Mulberry Family)

MORUS ALBA L. – CW, SW; MWL, SUCWL, WE; C = 0; BSUH 20031.

Morus rubra L. – SW; MWL; Rare; C = 4; BSUH 19732.

MYRSINACEAE

Lysimachia ciliata L. – CW, SW; OF; Rare but locally common; C = 4; BSUH 19966.

OLEACEAE (Olive Family)

Fraxinus americana L. – SW; WE; Rare; C = 4; BSUH 19886.

Fraxinus nigra Marshall – CW, SW; MWL around vernal pools; Infrequent; C = 7; BSUH 19731.

Fraxinus pennsylvanica Marshall – CW, SW; MWL, SUCWL; Infrequent; C = 1; BSUH 19662, 19961. [NOTE: prior to the emeral ash bore invasion, this was the most abundant tree species in both woodlands]

LIGUSTRUM OBTUSIFOLIUM Siebold & Zucc. – CW, SW; MWL; Infrequent; C = 0; BSUH 20040.

ONAGRACEAE (Evening Primrose Family)

Circaea lutetiana L. ssp. *canadensis* (L.) Asch. & Magnus – CW, SW; MWL; Abundant; C = 2; BSUH 19783.

Epilobium coloratum Biehler – CW, SW; CB near pond, WE; Infrequent; C = 3; BSUH 19829.

Ludwigia palustris (L.) Elliott – SW; VP; Rare but locally abundant; C = 3; BSUH 19867, 19971.

Oenothera biennis L. – CW, SW; OF, WE; Rare; C = 0; BSUH 19773.

OXALIDACEAE (Wood Sorrel Family)

Oxalis dillenii Jacq. – CW, SW; MWL; Abundant; C = 0; BSUH 19955.

Oxalis stricta L. – CW, SW; MWL; Infrequent; C = 0; BSUH 19728.

PAPAVERACEAE (Poppy Family)

Sanguinaria canadensis L. – CW, SW; MWL; Common; C = 5; BSUH 19677, 19762.

Stylophorum diphyllum (Michx.) Nutt. – CW,SW; MWL; Rare; C = 7; BSUH 19810.

PENTHORACEAE (Ditch stonecrop Family)

Penthorum sedoides L. – CW, SW; SUCWL, VP; Rare but locally common; C = 8; BSUH 19831.

PHRYMACEAE (Lopseed Family)

Mimulus alatus Aiton – CW, SW; MWL, VP; Infrequent but locally common; C = 4; BSUH 19700.

Phryma leptostachya L. – CW, SW; MWL; Infrequent; C = 4; BSUH 20053.

PLANTAGINACEAE (Plantain Family)

Gratiola neglecta Torr. – CW, SW; SUCWL, WE/OF; Infrequent but locally common; C = 4; BSUH 19757.

Penstemon calycosus Small – CW, SW; MWL; Infrequent; C = 4; BSUH 20023.

PLANTAGO LANCEOLATA L. – CW, SW; OF, WE; Common; C = 0; BSUH 19753.

Plantago rugelii Decne. – CW, SW; MWL, SUCWL, WE; Abundant; C = 0; BSUH 19768.

Veronica peregrina L. var. *peregrina* – SW; WE/OF; Infrequent but locally common; C = 0; BSUH 19848, 19862.

PLATANACEAE (Plane-Tree Family)

Platanus occidentalis L. – CW; MWL, SUCWL; Rare; C = 3; BSUH 20030.

POLEMONIACEAE (Phlox Family)

Phlox divaricata L. ssp. *divaricata* – CW, SW; MWL; Abundant; C = 5; BSUH 19802.

Polemonium reptans L. var. *reptans* – CW, SW; MWL; Infrequent; C = 5; BSUH 19804.

POLYGONACEAE (Smartweed Family)

Fallopia scandens (L.) Holub – CW, SW; MWL/CB; Rare; C = 0; BSUH 19740.

PERSICARIA LONGISETA (de Bruijn) Kitag. – CW, SW; MWL, SUCWL; Common; C = 0; BSUH 20060.

PERSICARIA MACULOSA Gray – CW, SW; MWL; Infrequent; C = 0; BSUH 19836.

Persicaria punctata (Elliott) Small – CW, SW; SUCWL, VP; Infrequent; C = 3; BSUH 19847.

Persicaria virginiana (L.) Gaertn. – CW, SW; MWL; Abundant; C = 3; BSUH 19790.

POLYGONUM AVICULARE L. – CW, SW; WE; Common; C = 0; BSUH 19962.

RUMEX CRISPUS L. – CW, SW; MWL, SUCWL; Common; C = 0; BSUH 20045.

PORTULACACEAE (Purslane Family)

PORTULACA OLERACEA L. – CW; MWL; Rare; C = 0; BSUH 19838.

RANUNCULACEAE (Buttercup Family)

ERANTHIS HYEMALIS (L.) Salisb. – CW; MWL [planted and naturalized]; Rare but locally abundant; C = 0; BSUH 19747.

Hepatica acutiloba D.C – CW; MWL near vernal pool; Rare; C = 8; BSUH 19746.

Ranunculus abortivus L. – CW, SW; MWL; Infrequent; C = 0; BSUH 19669, 19796.

Ranunculus hispidus Michx. var. *caricetorum* (Greene) T. Duncan – CW, SW; VP; Abundant; C = 10; BSUH 19902, 19807.

Ranunculus hispidus Michx. var. *hispidus* – CW; MWL; Infrequent; C = 7; BSUH 19875.

Thalictrum revolutum DC. – CW; WE; Rare; C = 5; BSUH 19741.

Thalictrum thalictroides (L.) Eames & B. Boivin – CW; MWL; Infrequent; C = 7; BSUH 19664.

RHAMNACEAE (Buckthorn Family)

RHAMNUS CATHARTICA L. – CW; MWL, SUCWL, WE; Infrequent; C = 0; BSUH 20014.

ROSACEAE (Rose Family)

Agrimonia parviflora Aiton – CW, SW; OF; Infrequent but locally abundant; C = 4; BSUH 19794.

Agrimonia pubescens Wallr. – CW, SW; MWL; Infrequent; C = 5; BSUH 19956.

Crataegus crus-galli L. – CW, SW; OF; Rare; C = 4; BSUH 19943.

Crataegus mollis (Torr. & A. Gray) Scheele – CW, SW; MWL; Infrequent; C = 2; BSUH 19991, 20020.

Crataegus phaenopyrum (L. f.) Medik. – SW; OF; Rare (one tree); C = 0; BSUH 19856.

Crataegus punctata Jacq. – CW, SW; MWL; Rare; C = 2; BSUH 20044.

Fragaria virginiana P. Miller – CW, SW; OF; Infrequent but locally common; C = 2; BSUH 19940.

Geum canadense Jacq. var. *canadense* – CW, SW; MWL; Abundant; C = 1; BSUH 19764.

Geum laciniatum Murray – CW, SW; CB, OF, MWL; Abundant; C = 3; BSUH 20055.

Geum vernum (Raf.) Torr. & A. Gray – CW, SW; CB; OF, MWL, SUCWL; Abundant; C = 1; BSUH 19766, 19809, 19758.

MALUS PUMILA P. Miller – CW, SW; OF; Rare; C = 0; BSUH 19811.

Potentilla norvegica L. – CW, SW; OF; Rare; C = 0; BSUH 19833.

Potentilla simplex Michx. – CW, SW; MWL; Common but locally abundant; C = 2; BSUH 19666.

Prunus americana Marshall – CW, SW; MWL; Rare; C = 4; BSUH 20029.

Prunus serotina Ehrh. – CW, SW; MWL; Infrequent; C = 1; BSUH 19936, 20001.

PYRUS CALLERYANA Decne. – CW; OF, SUCWL; Infrequent; C = 0; BSUH 20033.

ROSA MULTIFLORA Thunb. ex Murray – CW, SW; OF, SUCWL; C = 0; BSUH 20018.

Rosa setigera Michx. – CW, SW; OF, SUCWL, WE; Infrequent; C = 4; BSUH 19752.

Rubus occidentalis L. – CW, SW; CB, OF; Infrequent; C = 1; BSUH 19942, 20003.

Rubus pensilvanicus Poir. – CW, SW; CB; SUCWL; Commom; C = 5; BSUH 20011.

RUBIACEAE (Madder Family)

Galium aparine L. – CW, SW; CB; MWL, SUCWL; Common; C = 1; BSUH 19779.

Galium circaezans Michx. – CW, SW; CB, MWL; Common; C = 7; BSUH 20022.

Galium concinnum Torr. & A. Gray – CW, SW; MWL; Common; C = 5; BSUH 20048.

Galium obtusum Bigelow var. *obtusum* – CW, SW; MWL around vernal pools; Common; C = 5; BSUH 19903.

RUTACEAE (Citrus Family)

Zanthoxylum americanum P. Miller – CW, SW; SUCWL; Infrequent but locally common; C = 3; BSUH 20015.

SALICACEAE (Willow Family)

Populus deltoides Marshall – CW, SW; SUCWL; Infrequent; C = 1; BSUH 20017.

SAPINDACEAE (Soapberry Family)

Acer negundo L. var. *negundo* – CW, SW; MWL near vernal pools; Rare; C = 1; BSUH 19890.

Acer rubrum L. var. *rubrum* – CW; MWL; Infrequent; C = 5; BSUH 19976.

Acer saccharum Marshall – CW, SW; MWL; Abundant; C = 4; BSUH 19661, 19776.

Acer saccharinum L- CW, SW; Common; C = 1; BSUH 19998.

Aesculus glabra Willd. var. *glabra* –CW, SW; MWL; Abundant; C = 5; BSUH 19799.

SOLANACEAE (Nightshade Family)

DATURA STRAMONIUM L. – CW; OF - distured area; Rare; C = 0; BSUH 19698.

Solanum carolinense L. var. *carolinense* –CW, SW; OF; Infrequent; C = 0; BSUH 19710.

Solanum ptycanthum Dunal – CW, SW; MWL; Rare but locally common; C = 0; BSUH 20056.

STAPHYLEACEAE (Bladdernut Family)

Staphylea trifolia L. – SW; MWL; Rare but locally common; C = 5; BSUH 19737.

THEOPHRASTACEAE

Samolus parviflorus Raf. – CW, SW; SUCWL, WE/OF; Rare but locally abundant; C = 5; BSUH 19981.

ULMACEAE (Elm Family)

Celtis occidentalis L. – CW, SW; MWL; Common; C = 3; BSUH 20032.

Ulmus americana L. –CW, SW; MWL; Common; C = 3; BSUH 19816, 19668.

ULMUS PUMILA L. – CW, SW; OF, SUCWL; Infrequent; C = 0; BSUH 19755.

Ulmus rubra Muhl. – CW, SW; MWL; Infrequent; C = 3; BSUH 20026.

URTICACEAE (Nettle Family)

Boehmeria cylindrica (L.) Sw. – CW, SW; VP; Common; C = 3; BSUH 19774, 19877.

Laportea canadensis (L.) Wedd. – CW, SW; MWL; Infrequent but locally common; C = 2; BSUH 19958.

Pilea pumila (L.) A. Gray var. *pumila* – CW, SW; MWL, SUCWL; Infrequent but locally common; C = 2; BSUH 19739.

VALERIANACEAE

Valerianella umbilicata (Sull.) Alph. Wood – CW, SW; OF; Infrequent; C = 5; BSUH 19939.

VERBENACEAE (Vervain Family)

Verbena urticifolia L. – CW, SW; MWL; Infrequent; C = 3; BSUH 19785.

VIOLACEAE (Violet Family)

Viola sororia Willd. – CW, SW; SUCWL; Infrequent; C = 1; BSUH 19780.

Viola striata Aiton – CW, SW; MWL; Infrequent; C = 4; BSUH 19689.

VITACEAE (Grape Family)

Parthenocissus quinquefolia (L.) Planch. – CW, SW; MWL; Abundant; C = 2; BSUH 19671.

Vitis riparia Michx. – CW, SW; SUCWL; Common; C = 1; BSUH 19934.

Vitis vulpina L. – CW, SW; WE Infrequent; C = 3; BSUH 19695.

MAGNOLIOPHYTA

LILIOPSIDA (Monocotyledons)

ALISMATACEAE (Water-plantain Family)

Alisma subcordatum Raf. – SW; VP; Rare; C = 2; BSUH 19712.

AMARYLLIDACEAE (Amaryllis Family)

Allium canadense L. var. *canadense* –CW, SW; MWL; Rare but locally abundant; C = 1; BSUH 19665.

Allium tricoccum Aiton [SYN: *Allium burdickii* (Hanes) A.G. Jones] – CW; MWL; Infrequent but locally common; C = 6; BSUH 19835.

ALLIUM VINEALE L. – CW, SW; MWL; Rare; C = 0; BSUH 19686.

GALANTHUS NIVALIS L. – CW; MWL; Rare but locally abundant [naturalized]; C = 0; BSUH 19676.

NARCISSUS POETICUS L. – CW; MWL; Infrequent but local abundant [naturalized]; C = 0; BSUH 19681.

NARCISSUS PSEUDONARCISSUS L. – CW; MWL; Infrequent but locally common [naturalized]; C = 0; BSUH 19748.

ARACEAE (Arum Family)

Arisaema dracontium (L.) Schott – CW, SW; MWL; Common, especially in Skinner; C = 5; BSUH 19674.

Arisaema triphyllum (L.) Schott ssp. *triphyllum* – CW, SW; MWL; Infrequent; C = 4; BSUH 19805.

ASPARAGACEAE (Asparagus Family)

ASPARAGUS OFFICINALIS L. – CW; WE/OF; Rare; C = 0; BSUH 19771.

Camassia scilloides (Raf.) Cory – CW, SW; MWL; Infrequent but locally common; C = 5; BSUH 19673.

CHIONODOXA LUCILIAE Boiss. – CW; MWL; Rare but locally abundant; naturalized; C = 0; BSUH 19745.

Maianthemum racemosum (L.) Link ssp. *racemosum* – CW; MWL; Infrequent but locally common; C = 4; BSUH 20024.

ORNITHOGALUM UMBELLATUM L. – CW; MWL; Rare; C = 0; BSUH 19664.

Polygonatum biflorum (Walter) Elliott var. *biflorum* – CW, SW; MWL; Infrequent; C = 4; BSUH 19778.

Polygonatum biflorum (Walter) Elliott var. *commutatum* (Schult. & Schult. f.) Morong – CW; MWL; Rare; C = 4; BSUH 20034.

COMMELINACEAE (Spiderwort Family)

Tradescantia subaspera Ker Gawl. – SW; MWL; Common; C = 4; BSUH 19754.

Tradescantia virginiana L. – SW; WE; Rare; C = 7; BSUH 20043.

CYPERACEAE (Sedge Family)

Carex blanda Dewey – CW, SW; MWL; Abundant; C = 1; BSUH 19948.

Carex cephalophora Muhl. ex Willd. – CW, SW; MWL; Infrequent; C = 3; BSUH 19929.

Carex cristatella Britton – CW; MWL; Rare but locally abundant; C = 3; BSUH 19851.

Carex davisii Schwein. & Torr. – CW, SW; MWL; Abundant; C = 3; BSUH 19931.

Carex gracillima Schwein. – SW; MWL; Infrequent; C = 7; BSUH 19910.

Carex granularis Muhl. ex Willd. – CW, SW; MWL; Abundant; C = 2; BSUH 19912, 19927.

Carex grayi Carey – CW, SW; SUCWL; Rare; C = 5; BSUH 19915.

Carex grisea Wahlenb. –CW, SW; MWL; Abundant; C = 3; BSUH 19853, 19947.

Carex hirtifolia Mack. – CW, SW; SUCWL; Infrequent; C = 5; BSUH 19899, 19917.

Carex hystericina Muhl. ex Willd. – CW; CB near pond; Rare; C = 5; BSUH 19913.

Carex jamesii Schwein. – CW, SW; MWL; Common; C = 4; BSUH 19945.

Carex lacustris Willd. – CW, SW; VP; Common; C = 7; BSUH 19946.

Carex laxiculmis Schwein. var. *laxiculmis* – CW, SW; MWL; Infrequent but locally common; C = 7; BSUH 19911.

Carex leavenworthii Dewey – CW, SW; MWL; Infrequent; C = 1; BSUH 19852.

Carex lupulina Muhl. ex Willd. – CW; MWL around vernal pools; C = 4; BSUH 19892.

Carex molesta Mack. ex Bright – CW, SW; OF; Abundant; C = 2; BSUH 19922.

Carex radiata (Wahlenb.) Small – CW, SW; MWL; Abundant; C = 4; BSUH 19930, 20008, 19901.

Carex shortiana Dewey – CW, SW; MWL; Infrequent; C = 3; BSUH 19894, 19924.

Carex sparganioides Muhl. ex Willd. – SW; MWL; Rare; C = 4; BSUH 19916.

(#) *Carex squarrosa* L. – CW; VP; Rare; C = 4; BSUH 19979.

Carex stipata Muhl. ex Willd. var. *stipata* – CW, SW; MWL; Infrequent; C = 2; BSUH 19928.

Carex tribuloides Wahlenb. var. *tribuloides* – CW, SW; MWL around vernal pools; Abundant; C = 5; BSUH 19896, 19978, 19988.

Carex vulpinoidea Michx. – CW, SW; SUCWL; Infrequent; C = 2; BSUH 19895, 19923.

Cyperus esculentus L. var. *leptostachyus* Böckler – CW, SW; OF; Infrequent; C = 0; BSUH 19949.

Cyperus strigosus L. – CW; MWL, SUCWL; Infrequent; C = 0; BSUH 19859.

Eleocharis obtusa (Willd.) Schult. – CW, SW; OF, WE/OF; Infrequent but locally abundant; C = 1; BSUH 19333.

Scirpus atrovirens Willd. – SW; WE/OF; Rare; C = 4; BSUH 19969.

Scirpus pendulus Muhl. – CW, SW; CW; MWL; Infrequent but locally common; C = 2; BSUH 19893, 19985.

DIOSCOREACEAE (Yam Family)

Dioscorea villosa L. – SW; MWL; Infrequent; C = 4; BSUH 19914.

IRIDACEAE (Iris Family)

Sisyrinchium angustifolium Mill. – CW, SW; CW; MWL; Infrequent but widespread; C = 3; BSUH 20051.

JUNCACEAE (Rush Family)

Luzula multiflora (Ehrh.) Lej. var. *multiflora* – CW; SUCWL; Rare but locally abundant; C = 6; BSUH 19672.

Juncus tenuis Willd. – CW, SW; MWL, SUCWL; Common; C = 0; BSUH 19925.

Juncus torreyi Coville – CW, SW; WE near creek; Rare; C = 3; BSUH 19967.

LEMNACEAE (Duckweed Family)

Lemna minor L. – SW; VP; Common; C = 3; BSUH 19972.

LILIACEAE (Lily Family)

Erythronium albidum Nutt. – CW, SW; MWL; Common and locally abundant; C = 3; BSUH 19743.

Erythronium americanum Ker Gawl. ssp. *americanum* – CW; MWL; Rare; C = 5; BSUH 19687.

Lilium michiganense Farw. – SW; MWL; Rare; C = 5; BSUH 20016.

MELANTHIACEAE (Bunchflower Family)

Trillium recurvatum Beck – CW, SW; MWL; Abundant; C = 4; BSUH 19680, 19759.

Trillium sessile L. – CW, SW; MWL; Abundant; C = 4; BSUH 19679, 19760.

ORCHIDACEAE (Orchid Family)

Spiranthes ovalis Lindl. var. *erostellata* Catling – CW; OF; Rare; C = 3; BSUH 20066. (State Watch List)

POACEAE (Grass Family)

AGROSTIS GIGANTEA Roth –CW, SW; OF; Common; C = 0; BSUH 19849.

Agrostis perennans (Walter) Tuck. – CW, SW; MWL; Infrequent but locally abundant; C = 2; BSUH 19871.

Alopecurus carolinianus Walter – CW, SW; WE/OF; Rare but locally common; C = 0; BSUH 19926.

Andropogon gerardii Vitman – CW, SW; OF; Rare but locally common; C = 5; BSUH 19881.

BROMUS COMMUTATUS Schrad. – CW, SW; SUCWL; Rare; C = 0; BSUH 19909.

BROMUS INERMIS Leyss. –CW, SW; MWL; Rare; C = 0; BSUH 19897, 19908.

BROMUS JAPONICUS Murray – SW; WE; Infrequent; C = 0; BSUH 19951.

Cinna arundinacea L. CW, SW; MWL; Abundant; C = 4; BSUH 19845.

DACTYLIS GLOMERATA L. – CW, SW; OF, WE; Infrequent; C = 0; BSUH 20007.

Dichanthelium acuminatum (Sw.) Gould & Clark var. *fasciculatum* (Torr.) Freckman – CW, SW; Infrequent but widespread; C = 2; BSUH 19857, 19866, 19891.

DIGITARIA ISCHAEMUM (Schreber) Muhl. – CW; SUCWL, WE; Infrequent but locally common; C = 0; BSUH 19873.

DIGITARIA SANGUINALIS (L.) Scop. – CW; SUCWL, WE; Infrequent but locally common; C = 0; BSUH 19872.

ECHINOCHLOA CRUSGALLI (L.) P. Beauv. – CW; MWL, SUCWL; Infrequent; C = 0; BSUH 19841.

Echinochloa muricata (P. Beauv.) Fernald var. *muricata* – CW, SW; SUCWL; Common; C = 1; BSUH 19870.

ELEUSINE INDICA (L.) Gaertn. – CW; WE; Infrequent; C = 0; BSUH 19885.

Elymus hystrix L. – CW, SW; MWL, SUCWL; Common, locally abundant; C = 5; BSUH 19888.

Elymus macgregorii R. Brooks & J.J.N. Campb. – CW, SW; MWL; Infrequent; C = 3; BSUH 19854.

Elymus villosus Muhl. ex Willd. – CW, SW; MWL; Common; C = 4; BSUH 19887.

Elymus virginicus L. – CW, SW; MWL; Common; C = 3; BSUH 19977.

ERAGROSTIS PILOSA (L.) P. Beauv. var. *PILOSA* – CW, SW; WE; Rare; C = 0; BSUH 19883.

Festuca arundinacea Schreb. (=*SCHEDONORUS ARUNDINACEUS* (Schreb.) Dumort) – CW, SW; OF; Abundant; C = 0; BSUH 19824, 19970.

Festuca subverticillata (Pers.) Alexeev – CW, SW; MWL; Common; C = 4; BSUH 19919.

Glyceria striata (Lam.) Hitchc. – CW, SW; MWL; Common; C = 4; BSUH 19907.

HORDEUM JUBATUM L. ssp. *JUBATUM* – CW; WE; Rare; C = 0; BSUH 19850.

Leersia oryzoides (L.) Sw. – CW, SW; MWL, SUCWL; C = 2; BSUH 19952.

Leersia virginica Willd. – CW, SW; MWL, SUCWL; Abundant; C = 4; BSUH 19830.

Panicum capillare L. – CW; OF; Rare; C = 0; BSUH 19869.

Panicum dichotomiflorum Michx. var. *dichotomiflorum* – CW, SW; OF, WE; Infrequent but locally common; C = 0; BSUH 19825.

Panicum virgatum L. var. *virgatum* – CW; OF; Rare but locally common; C = 4; BSUH 19844.

Phalaris arundinacea L. – CW; OF; Rare; C = 0; BSUH 19906. (Native, K. Yatskievych, Pers. Comm.).

PHLEUM PRATENSE L. – CW, SW; OF, WE; Infrequent; C = 0; BSUH 19889.

POA ANNUA L. – CW, SW; OF, SUCWL, WE; Infrequent; C = 0; BSUH 19921.

POA COMPRESSA L. – CW, SW; MWL; Common; C = 0; BSUH 19898.

POA PRATENSIS L. ssp. *PRATENSIS* – CW, SW; OF, SUCWL, WE; Common; C = 0; BSUH 19992.

Poa sylvestris A. Gray – CW, SW; MWL; Common; C = 5; BSUH 19918.

POA TRIVIALIS L. – CW; MWL especially around vernal pools; Infrequent but locally abundant; C = 0; BSUH 19900.

Schizachyrium scoparium (Michx.) Nash var. *scoparium* – CW; OF; Infrequent but locally abundant; C = 4; BSUH 19818.

SETARIA FABERI Herrm. – CW, SW; OF, WE; Common; C = 0; BSUH 19860.

SETARIA PUMILA (Poir.) Roem. & Schult. – CW, SW; OF, WE; Common; C = 0; BSUH 19858.

SETARIA VIRIDIS (L.) P. Beauv. var. *VIRIDIS* – SW; WE/OF; Infrequent; C = 0; BSUH 19950.

Sorghastrum nutans (L.) Nash – CW; OF; Infrequent but locally common; C = 4; BSUH 19868.

SORGHUM BICOLOR (L.) Moench – SW; OF/WE; Rare; C = 0; BSUH 19822.

Sphenopholis intermedia (Rydb.) Rydb. – CW, SW; Infrequent but locally common; C = 3; BSUH 19932.

Tridens flavus (L.) Hitchc. – CW, SW; OF, WE; Infrequent; C = 1; BSUH 19865.

TRITICUM AESTIVUM L. – CW; CB near the pond; Rare; C = 0; BSUH 19968.

SMILACACEAE (Greenbrier Family)

Smilax ecirrhata (Engelm. ex Kunth) S. Watson – CW, SW; MWL; Common; C = 5; BSUH 19855.

Smilax hispida Raf. (= *Smilax tamnoides* L.) – CW, SW; MWL; Common; C = 3; BSUH 20021.

Smilax lasioneura Hook. – CW; MWL; Rare; C = 4; BSUH 19935, 20000.

TYPHACEAE (Cattail Family)

TYPHA ANGUSTIFOLIA L. – CW; OF in soil pit; Rare; C = 0; BSUH 19760.

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