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DOCUMENTED AND ANNOTATED CHECKLIST OF THE VASCULAR FLORA OF THE WALTER B. JACOBS MEMORIAL NATURE PARK, CADDO PARISH, LOUISIANA

LARRY R. RAYMOND
Ouachita Mountains Biological Station
6675 North Park Circle
Shreveport, Louisiana 71107

R. DALE THOMAS*

BARBARA R. AND MICHAEL* H. MACROBERTS
4418 Akard Avenue
Shreveport, Louisiana 71105

JOHN MICHAEL KELLEY
Kelley Botanical Library
Haughton, Louisiana 71037

*Deceased

ABSTRACT

An annotated, vouchered checklist is provided of the vascular plant taxa of the Walter B. Jacobs Memorial Nature Park, Caddo Parish, Louisiana. Over more than 48 years, 633 species representing 128 families and 368 genera were found in the 65 ha Park, which consists mainly of pine-oak-hickory forest. 43% of the species occurring in Caddo Parish and 19% of the species occurring in Louisiana are documented. *Eleocharis wolfii* (vulnerable), *Heuchera americana* (imperiled), *Minuartia muscorum* (vulnerable), *Primula meadia* (imperiled), *Ribes curvatum* (imperiled), *Senecio ampullaceus* (imperiled to critically imperiled), and *Triphora trianthophoros* (imperiled) are reported from the Park. The important role provided by parks for conservation is discussed.

Regarding biodiversity, county (parish), state, and federally owned lands will soon be, if they are not already, the main and perhaps the only refuges for uncommon or rare taxa and community types. For this reason, they will serve as genetic reservoirs for the introduction of species to areas depleted in diversity. In this paper, we document the vascular flora of one park owned and managed by the Parish of Caddo and comment on the role of small parks in the preservation of botanical diversity. The recent passage (November 2022) of a large bond issued to fund improvements in this park will impact some of the species listed due to anticipated new construction and a larger footprint planned for park amenities and increased parking. Ideally, efforts will be made to reduce the impacts on the Park's flora and fauna.

Study area and methods

In 1976, the 65 ha Walter B. Jacobs Memorial Nature Park (Jacobs Park or Park hereafter) was officially opened in Caddo Parish, Louisiana (Figure 1). This area of relatively undisturbed West Gulf Coastal Plain pine-oak-hickory forest is located approximately 24 km northwest of Shreveport. The Park has gently rolling terrain that ranges from 70 m above mean sea level (msl) to 56 m msl, where the confluence of Fordney and Shettleworth bayous crosses under the Blanchard Furrh Road (Figure 2). These two intermittent bayous traverse the Park from north to south and account for the silty, wet-natured bottomland soils with small stream forest plant associations found in the central two-thirds of the Park. The Park is in the Red River Drainage. Shettleworth Bayou flows into Cross Lake, which then flows into the Red River. The Park falls within a general Tertiary age soil complex known as Woodtell-Meth (Edwards et. al 1980). They are characteristic of very gently sloping to moderately

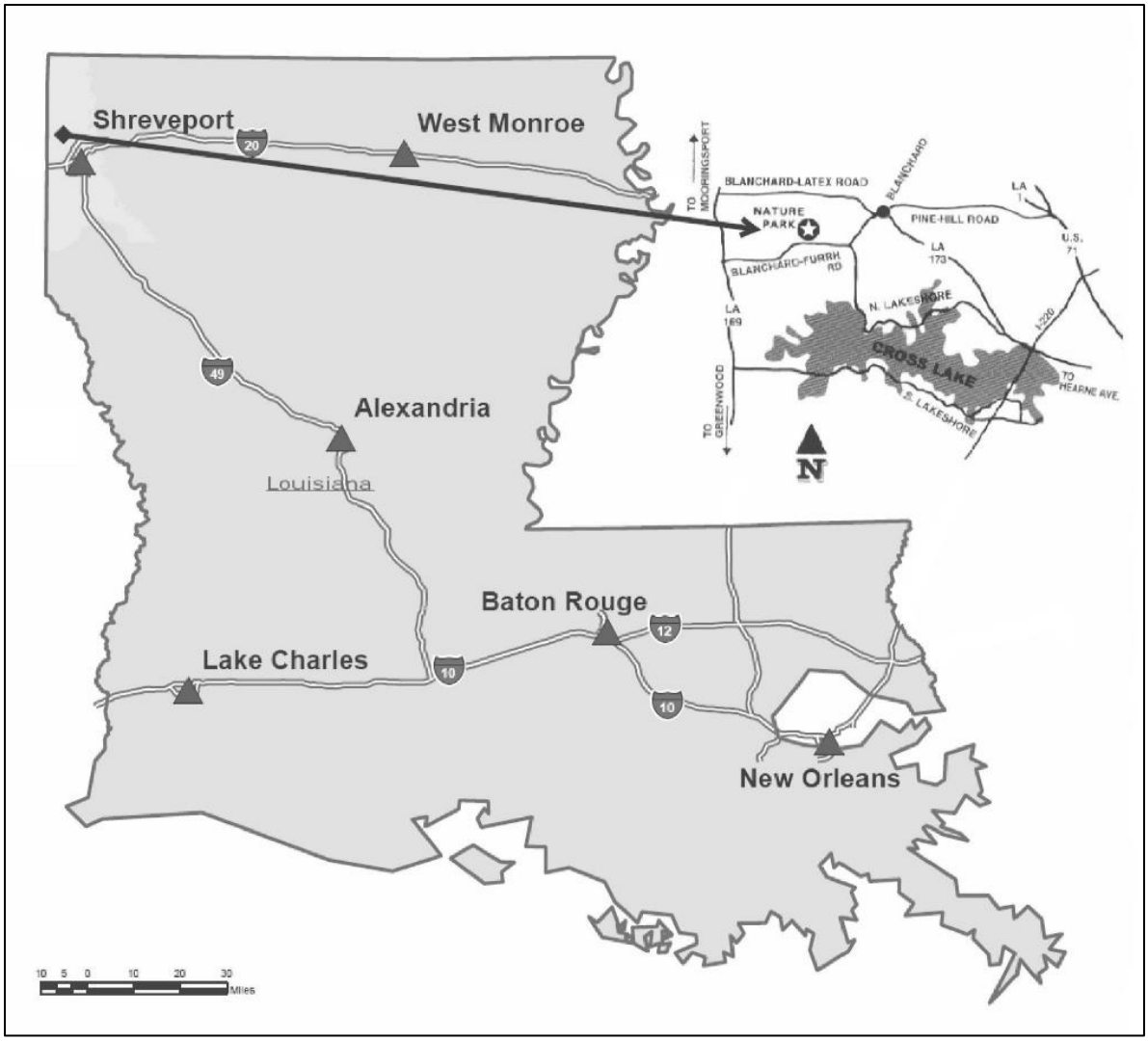

Figure 1. Map of Louisiana showing Caddo Parish and the location of Walter B. Jacobs Memorial Nature Park.

moderately steep terrain. They are moderately well-drained to well-drained and have a loamy surface-layer with a clay subsoil. Alluvial plains of both major and minor streams in this unit are composed of poorly drained Guyton soils. At least two-thirds of the Park contains these poorly drained Guyton soils that are loamy throughout. The soils are subject to frequent flooding, especially during the winter months (Edwards et. al 1980). As a result of this flooding, many vernal ponds occur in the Park, filling with water from autumn rains and most eventually drying out in the summer. These ponds provide essential habitat for many organisms, notably invertebrates (fairy shrimp), amphibians that use the ponds to lay eggs, and plants such as *Proserpinaca palustris* that associate with the mucky soils found in active flood areas.

Forested areas along Shettleworth and Fordney bayous are characterized by a mix of mesophytic and flood-tolerant species: *Acer floridanum*, *Carya cordiformis*, *Liquidambar styraciflua*, *Nyssa sylvatica*, *Quercus alba*, *Q. michauxii*, *Q. nigra*, *Q. pagoda*, *Q. shumardii*, *Tilia americana* var. *caroliniana*, *Ulmus alata*, *U. americana*, *U. crassifolia*, and *U. rubra* are common in the areas that are periodically inundated. Midstory trees such as *Ostrya virginiana*, *Carpinus caroliniana*, *Cornus*

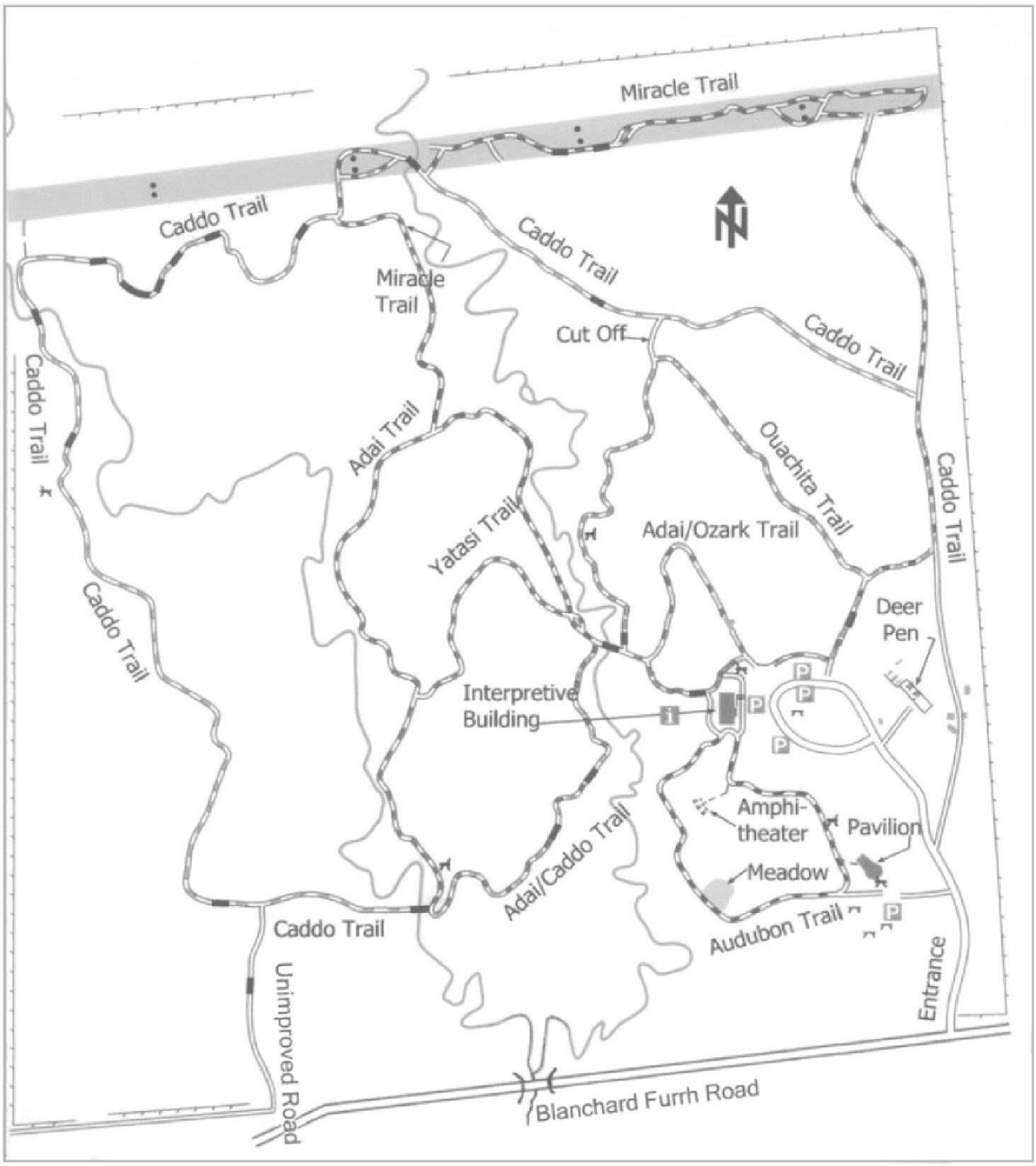

Figure 2. Map of Walter B. Jacobs Memorial Nature Park showing the trail system, two bayous, and the American Electric Power right-of-way (shaded).

florida, *Ilex decidua*, *Sassafras albidum*, and *Vaccinium arboreum* are common throughout the Park. The higher, drier areas, especially in the northeast corner of the Park, are characterized by pine-hardwood forests. Trees of *Pinus echinata*, characteristic of the original pine-oak-hickory association, are still present and dominant in some areas, although *Pinus taeda* has become dominant in much of the Park. The last timber harvest on the site occurred in the mid-1950s and focused on the uplands in the eastern third of the Park. Most of the trees in this area are even-aged, recruited immediately after the cut, but scattered trees spared in the last harvest date back to the 1870s (JMK, tree core samples). The uplands and the floodplains in the western two-thirds are less even-aged, with dominant trees now

70-90 years old, and scattered trees dating to the 1910s or before (JMK, pers. obs.). The largest oaks and pines exceed 100 cm in diameter and 37 m in height.

A power line right-of-way managed by American Electric Power crosses the northern sector of the Park from east to west (Figure 2). The right-of-way is approximately 30 m wide and 800 m long. Although the area was periodically herbicided in the past, the Parish has an agreement with the power company to keep the right-of-way mowed to prevent the use of herbicides. The Parks Department manages the right-of-way as a wildflower area and mows it periodically (usually in November) to maintain a lower height of the vegetation to prevent interference with the overhead lines. The right-of-way is the best area in the Park to look for open-area (heliophytic) species, and many of the species recorded in Appendix 1 were collected here. The right-of-way is bordered on the north by a section of woods approximately 64 m wide and 800 m long which forms the northern boundary of the Park.

Another, more natural, opening in the Park is a meadow near the southeastern corner on the first terrace east of Fordney Bayou (referred to as "The Meadow" by the Park's staff and literature). This 0.1 ha area is the largest out of the scattered hectare of small openings and woodlands with broken canopies and a dense, grassy ground flora, on these first terraces across the Park. They owe their appearance to a combination of sodic soils, extreme fluctuations in moisture, and occasional mowing in the case of the largest openings. A soil test from the aforementioned meadow confirmed the presence of sodium near the surface (SAR=7, pH=7.2) and many of the species present there are restricted, regionally, to sodic grassland sites (MacRoberts et al. 2009; Reid et al. 2010; Doffitt and Kelley 2022). Rarer species from this habitat include *Tradescantia occidentalis*, *Eleocharis wolfii*, *Carex annectens*, *Minuartia muscorum*, and *Oenothera spachiana*. Increment boring revealed that individual *Quercus similis* trees (30 - 45 cm in diameter) exceeded 140 annual growth rings in the sodic woodlands. Loblolly pines have very high mortality around the margins of these sites, most of them dying by the time they reach 50 cm in diameter. The Meadow is the type locality for *Tradescantia occidentalis* var. *melanthera* MacRoberts, which is restricted to mesic grasslands in Louisiana and the surrounding states (MacRoberts 1977; Kelley in prep).

The first appointed naturalist (Gary L. Graham) for the Parish of Caddo Parks and Recreation Department began collecting plants in 1975 with the purpose of documenting all taxa of vascular plants. Collecting continued on a regular basis since.

Results

Appendix 1 lists the vascular plant species found in the Park. The list includes native and exotic species that were not intentionally brought to the Park, as well as species purposely introduced into selected areas of the Park. Species purposely introduced since 1976 by staff are indicated with a solid square (▪) after the scientific name and are not included in the quantitative analysis of the Park's flora. Although many of these introduced species may no longer be extant in the Park, they are mentioned for historical purposes. Exotics were determined using Weakley (2022) and are indicated by an asterisk (*). A dagger symbol (†) indicates that the species has not been observed in the Park for more than ten years. Collectors include PJB = Phillip J. Barbour, LWC = Linda W. Clark, GLG = Gary L. Graham, SG = Stacy Gray, LMH = Laurence M. Hardy, RRH = Robert R. Haynes, John Michael Kelley (JMK), SPL = Steven P. Lynch, MM = Barbara and Michael MacRoberts, DTM = D. T. MacRoberts, LRR = Larry R. Raymond, GS = Gregory Stroud, and RDT = R. Dale Thomas. Vouchers are deposited at KBL, LSUS, LSU, and those originally deposited at NLU now reside at BRIT (SERNEC 2023). Some plants are listed on the basis of identification in the field, and the identifier and the date (month/day/year) are indicated. Nomenclature and authorities mostly follow Weakley (2022) or reductive synonymy therein. We documented 633 species of vascular plants not intentionally introduced into the Park. of which 76 are exotics (Table 1). There are 128 families and 368 genera represented. Asteraceae, Poaceae, Fabaceae, and Cyperaceae account for 38.6% of the flora.

Appendix II provides a vegetation classification for the Park.

Discussion

Any biological survey is a work in progress, and we recognize that the list of plants documented is not static. This list represents our best effort to document the vascular flora within the boundaries of Jacobs Park and the list is intended to provide baseline data of the Park flora during its first 48 years. Some of the plants collected in the early years may no longer be present, and others will surely be introduced, either naturally or intentionally. Anticipated impacts of new construction and a larger footprint designed to increase use of the Park will undoubtedly impact some of the current floral diversity. Since the Park was dedicated in 1976, all of the areas surrounding it have undergone dramatic changes. Forested areas along the north, west, and south boundaries have been heavily logged (Raymond and Hardy 1991), and several residential structures have been erected immediately east of the Park. A residential development replaced forests immediately south and across the road from the Park. Despite these changes, Jacobs Park remains intact and illustrates the diversity associated with a mature pine-oak-hickory forest.

For purposes of analysis, only plants not intentionally introduced into the Park were used. However, those species purposely introduced into the Park for *ex situ* conservation, or wildlife, aesthetics, or interpretive values are identified in Appendix 1 to provide a record of their origin for future studies of the Park's flora. Most of these introductions were located near the recently demolished Visitor Center and may be impacted by the new construction and larger footprint expected for the new Visitor Center. The species planted for *ex situ* conservation were meant to showcase and preserve species found in the region that are under threat in their native habitats. It is our hope that these plants will be protected, and moved, if necessary, before the new construction.

Species-area (richness) studies (e.g., Harris 1984) indicate that it takes ten times the area to double the number of species — in conservation terms, an area may be reduced 90% while the species richness is only halved. In the West Gulf Coastal Plain there are about 1200–1400 species per average sized county or parish (ca. 228,000 ha = 890 square miles; Caddo Parish has 1405 species in about 228,000 ha = 879 square miles), and about 3275 species in Louisiana (12,000,000 ha = about 46,000 square miles). But for comparison with Jacobs Park there is little information on intermediate-sized areas (50 to 1000 ha), and there are few data at the "micro-level" (0.0001 to 1.0 ha-sized areas) (MacRoberts 1989; MacRoberts and MacRoberts 2001; MacRoberts et al. 2002; MacRoberts et al. 2007; MacRoberts et al. 2008; Thomas and Allen 1993-1998; Weakley 2022). Jacobs Park covers 65 ha, with 633 species, thus fits the "macro" (greater than 50 ha) scale of species/area curve provided by MacRoberts et al. (2007).

Table 1. Area and species richness. Comparison of species richness of Jacobs Park (65 ha) to Caddo Parish (228,000 ha) and Louisiana State (12,000,000 ha) species diversity. The West Gulf Coastal Plain has about 20 species per 0.0001 ha (1 m^2) in open areas, and about 100-125 species per 1 ha in most habitats.

Area Size (ha.)	Number of species
0.0001	20
1.0	100-125
65.0	633
228,000.0	1455
12,000,000.0	3275

Although the Park is only 0.03% of Caddo Parish, it has over 43% of the species occurring in the Parish (Overby 1974; MacRoberts 1979; Thomas and Allen 1993-1998; MacRoberts and MacRoberts 2006; Kelley 2022). At the same time, the Park is only 0.0005% of Louisiana and yet has approximately 19.3 % of the species found in the State (MacRoberts 1989; Thomas and Allen 1993-1998; Weakley 2022). Similarly, Singhurst et al. (2022) documented the vascular plants in the Caddo Lake Wildlife Management Area, an area 55 times the size of the Park in the Upper West Gulf Coastal Plain and found only about 15% more species diversity. These findings underline the importance of small parks in the preservation of biodiversity (Baldwin and Fouch 2018).

While it is generally accepted that large land areas are best for conservation purposes (Harris 1984), it is not always practicable to obtain and properly manage such tracts (Kendal et al. 2017). In Caddo Parish, 501 ha in 15 parks are managed by the Parish of Caddo Parks and Recreation Department, and another 106 ha in areas closed to the public are managed by the Department. Of the more than 600 ha managed by the department, 21 ha are leased for public recreation and the remaining 586 ha are owned by the Parish of Caddo. The tracts managed by the Parks and Recreation Department range in size from 0.2 ha to 389 ha, with the majority less than 8 ha.

From the standpoint of the Single Large or Several Small (SLOSS) reserve debate, species richness may accumulate more rapidly with many small reserves as opposed to one large reserve (Nekola and White 2002). According to Nekola and White (2002), a spatially dispersed network of reserves representing a spectrum of sizes, including many mini-reserves (0.1–10 ha), is needed to protect all species. Several plants documented for Walter B. Jacobs Memorial Nature Park are listed as critically imperiled, imperiled, or vulnerable because of rarity (Louisiana Wildlife and Fisheries Plant Species of Greatest Conservation Need). These include *Eleocharis wolfii*, *Heuchera americana*, *Minuartia muscorum*, *Primula meadia*, *Ribes curvatum*, *Senecio ampullaceus*, and *Triphora trianthophoros*. These and other species considered rare in Louisiana (Louisiana Wildlife and Fisheries Plant Species of Greatest Conservation Need) occur in other parks managed by the Parish of Caddo Parks and Recreation Department and will hopefully be protected in perpetuity at these park sites. Examples of these are the critically imperiled *Viola pubescens* and the imperiled *Ribes curvatum* (Eddie D. Jones Park, 389 ha) and the imperiled *Zephyranthes chlorosolen* and critically imperiled *Styphnolobium affine* [Earl G. Williamson Park, 16 ha] (Kelley 2022). A concerted inventory effort would undoubtedly produce other rare plants in the parks managed by the Department in a more or less natural state. In addition, The Nature Conservancy manages the 201 ha Caddo Black Bayou Preserve in northern Caddo Parish and there are plans by U.S. Fish and Wildlife to establish a 271 ha Red River National Wildlife Refuge in southern Caddo Parish. Along with C. Bickham Dickson Park in Shreveport (238 ha, transferred to the Red River NWR), many of the natural habitats in northwestern Louisiana are represented on protected or semi-protected lands. However, much of the natural heritage of the area is not and what remains is vanishing quickly. MacRoberts and MacRoberts (1998) revisited 20 botanically important sites that they knew for twenty or more years and compared the condition of those sites then and now. They found that 18 of the 20 sites had deteriorated. Most of the deterioration was caused by urban development and agroforestry. Teague and Wendt (1994) made a natural area survey of Caddo Parish and located many high-quality examples of natural communities, including bottomland hardwood forest, cypress-tupelo swamp, bayhead swamp, mixed hardwood-loblolly forest, and xeric sandylands. The communities not represented in currently protected areas and additional areas of the same type should be sought for inclusion in an expanded Parish-park system. Teague and Wendt (1994) suggested a strategy and prioritization of habitat types most in need of protection for Caddo and Bossier parishes.

Park sites are selected for many reasons. Some of these reasons include land donated to governmental agencies for park development, closed landfills and other brownfield-type sites not suited for other development, and pressure from local communities to develop a park in their area. Perhaps emphasis on increasing the diversity of habitat types for the protection of biological diversity could be

added to the list of reasons above. Parks and sites managed by parks' departments serve an important role in preserving the biological diversity of local, regional, and national areas. As cited in this paper, even small park areas can play an important role in preserving the botanical diversity representative of much larger geographical areas. We encourage all park managers to consider biological diversity, along with all other benefits of parks and recreation, when developing park areas. Academic personnel at local universities and natural resources personnel of local, state, and federal agencies provide a good resource for helping to identify and document rare plants and habitats that should be carefully managed and protected by parks and recreation departments.

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Appendix 1. List of the vascular plant species in Walter B. Jacobs Memorial Nature Park.
(▪ Plant introduced into Park (not of natural origin, and not used in the analysis; * Plant considered exotic (Weakley 2022); † Plant has not been observed in the Park in over 10 years.)

PTERIDOPHYTA

Aspleniaceae: Spleenwort Family
Asplenium platyneuron (L.) BSP. (PJB 236, LRR 1298)

Athyriaceae: Lady Fern Family
Athyrium asplenioides (Michx.) A. Eaton (RDT 170087)

Dennstaedtiaceae: Bracken Family
Pteridium pseudocaudatum (Clute) Christenhusz (GLG 639, LRR 1334)

Dryopteridaceae: Wood Fern Family
Polystichum acrostichoides (Michx.) Schott (GLG 653, RDT 167056)

Lygodiaceae: Climbing Fern Family
Lygodium japonicum (Thunb.) Sw.* (LRR 1350)

Onocleaceae: Sensitive Fern Family
Onoclea sensibilis L. (PJB 235, LRR 1313)

Ophioglossaceae: Adder's Tongue Family
Botrypus virginianus (L.) Michx. (LRR 1624, 1901, LWC 51, MM 6206)
Ophioglossum pycnostichum (Fernald) Löve & Löve (LRR 1954)
Sceptridium biternatum (Savigny) Lyon (LRR 1600, 1965a)
Sceptridium dissectum (Spreng.) Lyon (LRR 1965)

Polypodiaceae: Polypody Family
Pleopeltis michauxiana (Weath.) Hickey & Sprunt (PJB 238, LRR 1972)

Pteridaceae: Maidenhair Fern Family
Adiantum capillus-veneris L.▪

Salviniaceae: Floating-fern family
Azolla caroliniana Willd. (JMK s.n.)

Thelypteridaceae: Marsh Fern Family
Pelazoneuron kunthii (Desv.) Sm. & Fawc.▪

Woodsiaceae: Woodsia Family
Woodsia obtusa (Spreng.) Torrey. ssp. *obtusa* (PJB 237)

SPERMATOPHYTA

GYMNOSPERMS

Cupressaceae: Cypress Family
Juniperus virginiana L. (LRR 1344, 1991)
Taxodium distichum (L.) Rich.▪

Pinaceae: Pine Family
Pinus echinata Mill. (MM 6199, LRR 1990)
Pinus taeda L. (LRR 1368)

ANGIOSPERMS

MONOCOTYLEDONS

Agavaceae: Agave Family
Agave virginica L. (LRR 1570)
Yucca aloifolia L. (identified by RDT 09/08/2000)
Yucca filamentosa L. (RDT 170103)

Alliaceae: Onion Family
Allium canadense L. (GLG 488, LRR 2007)
Nothoscordum bivalve (L.) Britton (GLG 435)
*Nothoscordum gracile** (Dryander ex Ait.) Stearn (LRR 2098)

Amaryllidaceae: Amaryllis Family
Hymenocallis liriosme (Raf.) Shinners (LRR 2113, 2116)
Zephyranthes tubispatha (L'Hér.) Herb.* (GLG 641)†

Araceae: Arum Family
Arisaema dracontium (L.) Schott (LRR 752)
Lemna valdiviana Phil. (GLG 605, LRR 686)

Arecaceae: Palm Family
Sabal minor (Jacq.) Pers. (GLG 586)

Aristolocahiaceae: Birthwort Family
Endodeca reticulata (Nutt.) Floden & Weakley (JMK s.n.)
Endodeca serpentaria (L.) Raf. (identified by JMK 10/26/2020)

Commelinaceae: Spiderwort Family
Commelina communis L.* (GLG 526)
Commelina diffusa Burm. f. (LRR 785, RDT 166980)
Commelina virginica L. (LRR 685, 784)
Murdannia nudiflora (L.) Brenan* (RDT 166983)
Tradescantia hirsutiflora Bush (LRR 1547, 2003, LJB 112, GS 146)
Tradescantia occidentalis (Britton) Smyth var. *occidentalis* (LRR 1564, RDT 88269)
Cyperaceae: Sedge Family
Carex albicans Willd. ex Spreng. var. *australis* (L.H. Bailey) J. Rettig (LRR 1722, RDT 127155, 155986)
Carex albolutescens Schwein. (LRR 2144)
Carex annectens (E.P. Bicknell) E.P. Bicknell (identified by JMK 2022)
Carex aureolensis Steud. (DTM 1281, LRR 1217, 1233)
Carex basiantha Steud. (identified by JMK 8/02/2021)
Carex blanda Dewey (RDT 170061, LRR 1185)
Carex cherokeensis Schwein. (LRR 1902, 2001, RDT 170058)
Carex complanata Torrey & Hook. (RDT 170186, LRR 2145)
Carex crebriflora Wiegand (LRR 1234)

Carex flaccosperma Dewey (RDT 170060, LRR 1213, 1952, 2143)
Carex joorii L.H. Bailey (LRR 1359, RDT 167047)
Carex lupulina Muhl. ex Willd. (RDT 167002, 170059, LRR 1216)
Carex lurida Wahlenb. (RDT 167048)
Carex muehlenbergii Schkuhr ex Willd. (RDT 170102)
Carex planispicata Naczi (LRR 1627)
Carex reniformis (L.H. Bailey) Small (LRR 1214)
Carex retroflexa Muhl. ex Willd. (LRR 1182, 1546, 1626)
Carex styloflexa Buckley (JMK s.n.)
Carex triangularis Boeckeler (LRR 1215)
Carex sangamonensis (Clokey) Mohlenbr. (RDT 170062)
Cyperus echinatus (L.) Alph. Wood (RDT 170072)
Cyperus hortensis (Salzm. ex Steud.) Dorr (RDT 166984)
Cyperus pseudovegetus Steud. (RDT 166992)
Cyperus retroflexus Buckley (RDT 167063)
Cyperus strigosus L. (LRR 1575, 1588, RDT 167020, 167060)
Eleocharis obtusa (Willd.) Schult. (JMK s.n.)
Eleocharis tuberculosa (Michx.) Roem. & Schult. (identified by RDT 05/25/2001)
Fimbristylis autumnalis (L.) Roem. & Schult. (RDT 167017)
Fimbristylis puberula (Michx.) Vahl (LRR 2147)
Rhynchospora caduca Elliot (RDT 170112, LRR 2028)]
Rhynchospora corniculata (Lam.) A. Gray (LRR 1360)
Rhynchospora glomerata (L.) Vahl (RDT 166993)
Rhynchospora inexpansa (Michx.) Vahl (identified by RDT 05/25/2001)
Scleria triglomerata Michx. (identified by RDT 05/25/2001)
Scleria oligantha Michx. (JMK s.n.)

Dioscoreaceae: Yam Family
Dioscorea villosa L. (LRR 1259, 1682, 1717, 2096, 2097)

Hypoxidaceae: Stargrass Family
Hypoxis hirsuta (L.) Coville (GLG 436, LRR 734, GS 127)†

Iridaceae: Iris Family
Alophia drummondii (Graham) R.C. Foster (LRR photograph)†
Iris brevicaulis Raf. (LRR 2094)
Iris flexicaulis Small (GLG 516)
Iris pseudacorus L.▪*
Iris shrevei Small (identified by RDT 05/25/2001)
Nemastylis geminiflora Nutt.▪†
Sisyrinchium angustifolium Mill. (GLG 469, LRR 1683)
Sisyrinchium atlanticum E. P. Bicknell (LMH 8841)
Sisyrinchium rosulatum E.P. Bicknell* (DTM 416)

Juncaceae: Rush Family
Juncus acuminatus Michx. (RDT 170122, 170124)
Juncus brachycarpus Engelm. (JMK s.n.)
Juncus coriaceus Mack. (identified by RDT 05/25/2001)
Juncus diffusissimus Buckley (JMK s.n.)
Juncus effusus L. ssp. *solutus* (Fernald & Wiegand) Hämet-Ahti (LRR 1999)
Juncus marginatus Rostk. (LRR 1880, 2027)

Juncus tenuis Willd. (RDT 170123)
Juncus validus Coville (RDT 167014)
Luzula bulbosa (Wood) Smyth & Smyth (SPL 4143)
Luzula echinata (Small) F.J. Herm. (RDT 170097)

Liliaceae: Lily Family
Erythronium albidum Nutt.▪
Erythronium rostratum W. Wolf▪

Melanthiaceae: Bunchflower Family
Stenanthium gramineum (Ker Gawl.) Morong var. *gramineum* (LRR 1305)

Orchidaceae: Orchid Family
Corallorrhiza wisteriana Conrad (LRR 1031)†
Cypripedium kentuckiense C.F. Reed▪†
Malaxis unifolia Michx. (LRR 1482, 1484)†
Neottia bifolia (Raf.) Baumbach (LRR 1038)
Platanthera flava (L.) Lindl. (LRR 1483)
Spiranthes cernua (L.) Rich. (SPL 17230)†
Spiranthes vernalis Engelm. & Gray (RDT 170070, 170071)
Tipularia discolor (Pursh) Nutt. (LRR 1367)
Triphora trianthophoros (Sw.) Rydb. var. *trianthophoros* (LRR 1529, 1601, JMK 756)

Poaceae: Grass Family
Agrostis hyemalis (Walt.) BSP. (LRR 1192, 1209)
Aira elegans Willd. ex Roem. & Schult.* (JMK s.n.)
Andropogon gerardii Vitman (RRH 5323, RDT 166990)
Andropogon tenuispatheus (Nash) Nash (LRR 2133)
Andropogon ternarius Michx. (LRR 2054)
Andropogon virginicus L. var. *virginicus* (RDT 166964, SPL 17218)
Aristida oligantha Michx. (LRR 2138)
Aristida purpurascens Poir. (identified by Charles Allen 10/29/2004)
Arundinaria gigantea (Walt.) Muhl. (GLG 581; RDT 170121)
Axonopus fissifolius (Raddi) Kuhlm. JMK (7/13/2020)
Briza minor L.* (RDT 170066)
Bromus catharticus Vahl var. *catharticus** (LRR 1235)
Bromus commutatus Schrad.* (RDT 170065)
Chasmanthium latifolium (Michx.) Yates (RRH 5324, LRR 1356)
Chasmanthium laxum (L.) Yates (RDT 166968)
Chasmanthium sessiliflorum (Poir.) Yates var. *sessiliflorum* (LRR 1345, RDT 166969)
Cinna arundinacea L. (RDT 167001)
Coleataenia anceps (Michx.) Soreng (LRR 1584, 2061, SPL 17197)
Coleataenia rigidula (Bosc ex Nees) LeBlond (LRR 2067, RDT 167025, SPL 17220)
Cynodon dactylon (L.) Pers.* (JMK s.n.)
Danthonia spicata (L.) P. Beauv. ex Roem. & Schult. (JMK s.n.)
Dichanthelium aciculare (Desv. ex Poir.) Gould & Clark (RDT 167026)
Dichanthelium acuminatum (Sw.) Gould & Clark (identified by JMK 5/29/2020)
Dichanthelium boscii (Poir.) Gould & Clark (identified by RDT 09/08/2000)
Dichanthelium commutatum (Schult.) Gould (RDT 167024, 170064)
Dichanthelium laxiflorum (Lam.) Gould (RDT 166958)
Dichanthelium microcarpon (Muhl. ex Elliott) Mohlenbr. (identified by JMK 5212021)

Dichanthelium ravenelii (Scribn. & Merr.) Gould (identified by JMK 11/01/2019)
Dichanthelium scoparium (Lam.) Gould (RDT 166994)
Dichanthelium sphaerocarpon (Elliot) Gould (LRR 676, 1352, RDT 167023)
Digitaria ciliaris (Retz.) Koeler (RDT 166996)
Digitaria sanguinalis (L.) Scop.* (RDT 166978)
Echinochloa colonum (L.) Link* (RDT166965)†
Eleusine indica (L.) Gaertn. (identified by JMK 7/13/2020)
Elymus virginicus L. (LRR 1353, 1675, 2030)
Eragrostis spectabilis (Pursh) Steud. (RDT 167049)
Erianthus alopecuroides (L.) Elliott (SPL 17184)
Erianthus contortus Elliott (LRR 2055)
Erianthus giganteus (Walt.) P. Beauv. (RDT 166997)
Erianthus strictus Elliott (SPL 17195)
Festuca bromoides L.* (RDT 170067)
Festuca octoflora Walt. (identified by RDT 05/25/2001)
Glyceria arkansana Fernald (LMH 8701, LRR s.n., RDT 167043)
Glyceria septentrionalis Hitchc. (identified by LRR 05/24/1979 and JMK 05/03/2020)
Hordeum pusillum Nutt. (identified by RDT 05/25/2001)
Kellochloa brachyantha (Steud.) Lizarazu, Nicola, & Scataglini (LRR 2134)
Leersia lenticularis Michx. (LRR 2139)
Leersia virginica Willd. (JMK s.n.)
Lolium arundinaceum (Schreb.) Darbyshire* (identified by RDT 05/25/2001)
Lolium perenne L.* (JMK s.n.)
Melica mutica Walt. (LRR 1183)
Oplismenus setarius (Lam.) Roem. & Schult. (RDT 167015)
Panicum dichotomiflorum Michx. var. *dichotomiflorum* (RDT 166961)
Paspalum dilatatum Poir. ssp. *dilatatum** (RDT 166999)
Paspalum floridanum Michx. (LRR 2064, RDT 166989)
Paspalum laeve Michx. (LRR 2137)
Paspalum notatum Flüggé* (JMK s.n.)
Paspalum plicatulum Michx. (RDT 170069)
Paspalum setaceum Michx. (JMK s.n.)
Paspalum urvillei Steud.* (LRR 2029)
Phalaris caroliniana Walt. (JMK s.n.)
Phanopyrum gymnocarpon (Elliot) Nash (RDT 167022)†
Piptochaetium avenaceum (L.) Parodi (LRR 2142)
Poa annua L.* (RDT 170063)
Poa autumnalis Muhl. ex Elliott (RDT 88262, MM 6204)
Polypogon monspeliensis (L.) Desf. (identified by JMK 06/01/2020)
Schizachyrium scoparium (Michx.) Nash (LRR 2060, 2153, RDT 166986)
Setaria parviflora (Poir.) Kerguélen (LRR 1968)
Setaria pumila (Poir.) Roem. & Schult.* (LRR 1242, SPL 17234)
Sorghastrum elliottii (C. Mohr) Nash (LRR 2136)†
Sorghastrum nutans (L.) Nash (LRR 2135)†
Sorghum halepense (L.) Pers.* (LRR 1264)
Sphenopholis obtusata (Michx.) Lamson-Scribn. (LRR 1193, 1208)
Steinchisma hians (Elliot) Nash (RDT 170068)
Tridens flavus (L.) Hitchc. (LRR s.n.)
Tridens strictus (Nutt.) Nash (LRR 1404, 1966, 1967, 2058, SPL 17219)
Tripsacum dactyloides (L.) L. (PJB 457, LRR 2053, RDT 167038)
Urochloa platyphylla (Munro ex Wright) R. Webster (LRR 2140)

Ruscaceae: Ruscus Family
Polygonatum biflorum (Walt.) Elliott *var. biflorum* (LRR 1299, 1964)

Smilacaceae: Greenbrier Family
Smilax bona-nox L. var. *bona-nox* (LRR 144)
Smilax glauca Walt. (LRR 829, 1317)
Smilax rotundifolia L. (LRR 1318)
Smilax smallii Morong (RDT 166960)

Trilliaceae: Trillium Family
Trillium gracile J.D. Freeman▪
Trillium recurvatum Beck▪

Typhaceae: Cattail Family
Typha latifolia L. (LRR 2095)

DICOTYLEDONS

Acanthaceae: Acanthus Family
Justicia lanceolata (Chapm.) Small (DTM 688, LRR 142, 1228, 1673)
Ruellia caroliniensis (J.F. Gmel.) Steud. (DTM 64, RDT 167051)
Ruellia humilis Nutt. (DTM 484, LRR 1713)
Ruellia pedunculata Torrey ex Gray (DTM 447, 1083, LRR 1201)

Aceraceae: Maple Family
Acer floridanum (Chapm.) Pax (RDT 166956, 170,083)
Acer negundo L. (GLG 426, LRR 1265)
Acer rubrum L. (GLG 398, 414, LRR 542, 616, 1918, 1992)

Altingiaceae: Sweet-Gum Family
Liquidambar styraciflua L. (LRR 1285, 1916)

Amaranthaceae: Amaranth Family
Amaranthus viridis L.* (RDT 166979, SPL 17210)

Anacardiaceae: Cashew Family
Rhus aromatica Aiton *var. aromatica*▪
Rhus copallinum L. (GLG 576, LRR 767, 1306, 1716)
Rhus glabra L. (LRR 2032)
Toxicodendron radicans (L.) Kuntze (LRR 2014)

Annonaceae: Custard-apple Family
Asimina triloba (L.) Dunal (LRR 1328)

Apiaceae: Carrot Family
Chaerophyllum tainturieri Hook. (GLG 441)
Cicuta maculata L. *var. maculata* (GLG 575, LRR 771, 1238)
Cyclospermum leptophyllum (Pers.) Sprague ex Britton & Wilson* (GLG 494)
Cynosciadium digitatum DC. (JMK s.n.)
Daucus pusillus Michx. (RDT 170100)
Eryngium prostratum Nutt. ex DC. (DTM 1052, GLG 643, LWC 179)

Eryngium yuccifolium Michx. (RDT 167003)
Polytaenia nuttallii DC. (GS 129)†
Ptilimnium capillaceum (Michx.) Raf. (LRR 770)
Ptilimnium nuttallii (DC.) Britton (GLG 564)
Sanicula canadensis L. (LRR 1227)
Sanicula smallii E.P. Bicknell (RDT 170095)†
Torilis helvetica (Jacq.) C.C. Gmel.* (identified by JMK 5/23/2020)
Trepocarpus aethusae Nutt. ex DC. (LWC 171, LRR 1239, 1674)
Zizia aurea (L.) W.D.J. Koch (DTM 554, LRR 732, RDT 170094)

Apocynaceae: Dogbane Family
Amsonia tabernaemontana Walt.▪
Asclepias perennis Walt. (DTM 78)†
Asclepias tuberosa L. (DTM 85, 463, GLG 560)
Asclepias variegata L. (DTM 456, LRR 1224)
Asclepias verticillata L. (DTM 488)
Gonolobus suberosus (L.) R. Brown *var. granulatus* (Scheele) Krings & Xiang (LRR 1912)
Matelea decipiens (Alexander) Woodson (RDT 170104)
Thyrsanthella difformis (Walt.) Pichon (GLG 550, LRR 149, 1244)
Vinca major L. (JMK s.n.)

Aquifoliaceae: Holly Family
Ilex decidua Walt. (GLG 443, LRR 1346)
Ilex opaca Aiton (LRR 1337, LMH 8616)
Ilex vomitoria Aiton (LRR 1973)

Araliaceae: Ginseng Family
Aralia spinosa L. (LRR 1335)
Hedera helix L.* (JMK s.n.)
Hydrocotyle verticillata Thunb. (RDT 170076)

Asteraceae: Sunflower Family
Ageratina altissima (L.) R.M. King & H. Rob. (RDT 167008, SPL 17240)
Ambrosia artemisiifolia L. (LRR 1395)
Ambrosia psilostachya DC. (LRR s.n., 1415, RDT 167053)
Ambrosia trifida L. (RDT 166950)
Antennaria parlinii Fernald *ssp. fallax* (Greene) Bayer & Stebbins (DTM 286, GLG 418)
Arnoglossum plantagineum Raf. (LRR 1260)
Baccharis halimifolia L. (LRR s.n., 1974)
Bidens discoidea (Torrey & Gray) Britton (RDT 167007)
Bidens frondosa L. (SPL 17192)
Boltonia diffusa Elliot (LRR 1578)
Bradburia pilosa (Nutt.) Semple (GLG 610, LWC 174, LRR 778, 1582, RDT 167006, SPL 17180)
Cirsium engelmannii Rydb. (GLG 620)†
Cirsium horridulum Michx. (GLG 493, LRR 1254)
Conoclinium coelestinum (L.) DC. (LRR 1312, SPL 17233)
Coreopsis grandiflora Hogg ex Sweet (GLG 537, RDT 170108)†
Coreopsis lanceolata L. (RDT 170109, LRR 2004)
Coreopsis tinctoria Nutt. (GLG 589, LRR 768, 1707)
Echinacea pallida (Nutt.) Nutt. (GLG 534, LRR 764, 1261)†
Echinacea purpurea (L.) Moench▪

Eclipta prostrata (L.) L. (RRH 5321, LRR 1397)
Elephantopus carolinianus Raeusch. (DTM 654, SPL 17191)
Elephantopus tomentosus L. (DTM 583, LRR 1349, 1591)
Erechtites hieracifolius (L.) Raf. ex DC. (JMK s.n.)
Erigeron canadensis L. (RDT 166947)
Erigeron philadelphicus L. (LRR 1188)
Erigeron pulchellus Michx. (DTM 968, GLG 473, LJB 107)
Erigeron strigosus Muhl. ex Willd. (GLG 434, LRR 795, 1255, 1879)
Erigeron tenuis Torrey & Gray (LJB 110)†
Eupatorium capillifolium (Lam.) Small (RDT 167032, SPL 17221)
Eupatorium serotinum Michx. (LRR 1403, 1413, SPL 17194)
Eurybia hemispherica (Alexander) Nesom (LRR 1401, SPL 17214)
Euthamia leptocephala (Torrey & Gray) Greene (LRR 1392, 1586, 1940, RDT 167000)
Gaillardia pulchella Foug. de Bondaroy (LRR 1698)†
Gamochaeta purpurea (L.) Cabrera (GS 146)
Helenium amarum (Raf.) H. Rock (GLG 588)
Helenium flexuosum Raf. (GLG 548, LWC 161, LRR 1237, 1706)
Helianthus angustifolius L. (LRR 1409, RDT 167040, SPL 17189)
Helianthus hirsutus Raf. (GLG 624, LRR 1271, SPL 17190)
Helianthus strumosus L. (LRR 763)
Heterotheca subaxillaris (Lam.) Britton & Rusby (RDT 167045)
Hieracium gronovii L. (RDT 167055)
Iva angustifolia Nutt. ex DC. (LRR 1414, RDT 166988, 167,050, SPL 17219)
Iva annua L. (LRR 1394)
Krigia cespitosa (Raf.) K.L. Chambers (GLG 419, LRR 794)
Krigia dandelion (L.) Nutt. (LRR 731, LWC 57)
Krigia occidentalis Nutt. (LRR 2148)
Lactuca canadensis L. (GLG 623)
Lactuca floridana (L.) Gaertn. (JMK s.n.)
Liatris pycnostachya Michx. (RDT 166991, LRR 1699, 2063)
Mikania scandens (L.) Willd. (LRR 687, SPL 17235)
Packera glabella (Poir.) C. Jeffrey (identified by RDT on 05/25/2001)
Packera obovata (Muhl. ex Willd.) Weber & Löve (DTM 316, 396, GLG 412, LJB 116)
Parthenium hispidum Raf. (LRR 1881)
Pluchea camphorata (L.) DC. (LRR 156, 680, 1583, SPL 17213)
Pluchea odorata (L.) Cass. (RDT 166973)
Pseudognaphalium obtusifolium (L.) Hilliard & Burtt (DTM 597, LRR 1587, SPL 17232)
Pyrrhopappus carolinianus (Walt.) DC. (GLG 542, LRR 1712)
Pyrrhopappus pauciflorus (D. Don) DC. (JMK s.n.)
Rudbeckia grandiflora (Sweet) DC. (DTM 1054, GLG 566, LRR 1272)
Rudbeckia hirta L. (GLG 549, LRR 1408)
Senecio ampullaceus Hook. (JMK s.n.)
Silphium radula Nutt. (DTM 1053)†
Solidago altissima L. (DTM 223)
Solidago auriculata Shuttlew. ex Blake (RDT 167054)
Solidago dispersa Small (LRR 2065, RDT166998)
Solidago nitida Torrey & Gray (LRR 1940)†
Solidago rugosa Mill. (LRR 774, 1405, DTM 670)
Solidago speciosa Nutt. (DTM 652)
Sonchus asper (L.) Hill* (RDT 166,982, SPL 17243)
Stokesia laevis (Hill) Greene▪

Symphyotrichum drummondii (Lindl.) Nesom (LRR 1416, 1599, SPL 17238, 17239)
Symphyotrichum dumosum (L.) Nesom (SPL 17231)
Symphyotrichum lateriflorum (L.) Löve & Löve (LRR 17, RDT 47998)
Symphyotrichum patens (Aiton) Nesom (SPL 17216, 17236, MM 6200)
Symphyotrichum pratense (Raf.) Nesom (DTM 658, SPL 17215)
Symphyotrichum subulatum (Michx.) Nesom (RDT 166962)
Symphyotrichum tenuifolium (L.) Nesom (identified by RDT 09/08/2000)
Taraxacum officinale F.H. Wigg.* (LRR 639)
Verbesina helianthoides Michx. (DTM 455)†
Verbesina virginica L. (LRR 1411, RDT 167027, SPL 17173)
Vernonia baldwinii Torrey (identified by RDT on 09/08/2000)
Vernonia gigantea (Walt.) Trel. (LRR 1571, SPL 17185)
Vernonia missurica Raf. (DTM 585, LRR 2068, RDT 167021)
Vernonia texana (A. Gray) Small (DTM 1076, LRR 146, LWC 177)
Xanthium chinense Mill. (LRR s.n.)
Youngia japonica (L.) DC. (identified by JMK 5/20/2020)

Balsaminaceae: Touch-Me-Not Family
Impatiens capensis Meerb. (RDT 170078)

Berberidaceae: Barberry Family
Nandina domestica Thunb.* (LRR 2024, RDT 166967)
Podophyllum peltatum L. (PJB 48, LRR 642, 1684)

Betulaceae: Birch Family
Betula nigra L. (LRR 1330, LMH 8614)
Carpinus caroliniana Walt. (RRH 4571, LRR 150, 1310, 1323, 1994)
Ostrya virginiana (Mill.) K. Koch (GLG 417, 419, LRR 541, 1277, 1287, 1704, 1996)

Bignoniaceae: Bignonia Family
Bignonia capreolata L. (LRR 1432)
Campsis radicans (L.) Seem. ex Bureau (LRR 1278, 1715)

Boraginaceae: Borage Family
Myosotis macrosperma Engelm. (LRR 733)

Brassicaceae: Mustard Family
Capsella bursa-pastoris (L.) Medik.* (LRR 1542)
Cardamine bulbosa (Schreb. ex Muhl.) BSP. (DTM 271, 322, LJB 196, LRR 1539, MM 6205)
Cardamine concatenata (Michx.) O. Schwarz▪
Cardamine hirsuta L.* (DTM 359, LRR 620, 740, 742)
Lepidium virginicum L. (LRR 757, 1256)

Buxaceae: Boxwood Family
Pachysandra procumbens Michx.▪ (LRR 1875)†

Campanulaceae: Bellflower Family
Lobelia appendiculata A. DC. (GLG 540, LRR 753, 1204, 1681)
Lobelia cardinalis L. (DTM 622, LRR 678, RDT 167013)
Lobelia puberula Michx. (LRR 10, GLG 685)†

Triodanis biflora (Ruiz & Pav.) Greene (LRR 1562)
Triodanis perfoliata (L.) Nieuwl. (GLG 508, LRR 1186, MM 6203)

Cannabaceae: Hops Family
Celtis laevigata Willd. (LRR 1293)

Caprifoliaceae: Honeysuckle Family
Lonicera japonica Thunb.* (GLG 500, LRR 1393, 1905)
Lonicera sempervirens L. (GLG 445)
Symphoricarpos orbiculatus Moench (LRR 865)

Caryophyllaceae: Pink Family
Cerastium brachypodum (Engelm. ex Gray) B.L. Rob. (identified by RDT 05/25/2001)†
Cerastium fontanum Baumg.* (GS 122)†
Cerastium glomeratum Thuill.* (MM 6202)
Sabulina muscorum (Fassett) E.E. Schill. (DTM 353, GLG 467, LRR 730, 1229, MM 6202a)
Silene gallica L.* (DTM 367)
Silene stellata (L.) W.T. Aiton (RDT 170,086)
Stellaria media (L.) Villars* (identified by LRR on 03/16/1977)

Celastraceae: Bittersweet Family
Euonymus americanus L. (LRR 1975, LMH 8615, RDT 48041)

Cistaceae: Rockrose Family
Crocanthemum carolinianum (Walt.) Spach (LRR 2008)
Lechea mucronata Raf. (RDT 167004)
Lechea tenuifolia Michx. (LRR 1236, 2026)

Convolvulaceae: Morning Glory Family
Dichondra carolinensis Michx. (identified by JMK 5/01/2020)
Ipomoea cordatotriloba Dennst. (GLG 650, LRR 1941)
Ipomoea lacunosa L. (JMK s.n.)
Ipomoea pandurata (L.) G.F.W. Meyer (LRR 2187)

Cornaceae: Dogwood Family
Benthamidia florida (L.) Spach (GLG 571, LRR 643, 1333, 1435)
Swida drummondii (C.A. Mey.) Soják▪

Crassulaceae: Stonecrop Family
Penthorum sedoides L. (DTM 616, 1072, LRR 683, RDT 167012)

Cucurbitaceae: Gourd Family
Melothria pendula L. (JMK s.n.)

Cyrillaceae: Titi Family
Cyrilla racemiflora L.▪

Droseraceae: Sundew Family
Drosera brevifolia Pursh (GLG 538)†

Ebenaceae: Ebony Family
Diospyros virginiana L. (LRR 1320)

Ericaceae: Heath Family
Hypopytis sp. Crantz (JMK s.n.) ("Species 3" sensu Weakley 2022)
Monotropa uniflora L. (LRR 1418)
Rhododendron canescens (Michx.) Sweet▪†
Vaccinium arboreum Marshall (LRR 1341)
Vaccinium elliottii Chapm. (LRR 1232, 1252, 2022)
Vaccinium virgatum Aiton (GLG 430, RDT 167057)

Euphorbiaceae: Spurge Family
Acalypha gracilens A. Gray (identified by JMK 10/31/2020)
Acalypha rhomboidea Raf. (LRR 1268)
Croton lindheimeri (Engelm. & Gray) Alph. Wood (LRR 1400, RDT 166957)
Croton glandulosus L. (GLG 619, LRR 1363, RDT 166946)
Euphorbia corollata L. (identified by JMK 8/11/2019)
Euphorbia heterophylla L. (RDT 166974)
Euphorbia nutans Lag. y Segura* (LRR 1661, RDT 166957, 166977)
Triadica sebifera (L.) Small* (LRR 2066, RDT 166949)

Fabaceae: Legume Family
Albizia julibrissin Durazz.* (LRR 1357)
Amorpha fruticosa L.▪
Amphicarpaea bracteata (L.) Fernald (RDT 166951)
Apios americana Medik. (LRR 2023)
Baptisia nuttalliana Small (LRR 1202, 1273, 2005)
Baptisia sphaerocarpa Nutt. (GLG 533)
Centrosema virginianum (L.) Benth. (LRR 1267)
Cercis canadensis L. (GLG 406, LRR 546, 1324, 1355, 1701)
Chamaecrista fasciculata (Michx.) Greene (GLG 578, LRR 766, 1269, 1576, 1718, 2062, LWC 154, SPL 17177)
Chamaecrista nictitans (L.) Moench (DTM 215)
Clitoria mariana L. (GLG 579, LRR 1297)
Crotalaria sagittalis L. (DTM 82, 457)†
Desmanthus illinoensis (Michx.) MacMillan ex B.L. Rob. & Fernald (RDT 170110)
Desmodium canescens (L.) DC. (LRR 1410)
Desmodium nuttallii (Schindl.) B.G. Schub. (LRR 1970, 2069)
Desmodium paniculatum (L.) DC. (SPL 17181)
Desmodium viridiflorum (L.) DC. (RDT 167030)
Erythrina herbacea L. (identified by JMK 12/01/2020)
Galactia volubilis (L.) Britton (GLG 644, LWC 158, 160)
Gleditsia triacanthos L. (LMH 8612)
Hylodesmum nudiflorum (L.) Ohashi & Mill. (JMK s.n.)
Kummerowia striata (Thunb.) Schindl.* (RDT 170118)
Lathyrus pusillus Elliot (DTM 795)
Lespedeza cuneata (Dum. Cours.) G. Don* (GLG 647, LRR 1407, 2034, 2056)
Lespedeza hirta (L.) Hornem. (DTM 678)
Lespedeza repens (L.) W.P.C. Barton (JMK s.n.)
Lespedeza stuevei Nutt. (LRR 783, 2052, RDT 167036)
Lespedeza violacea (L.) Pers. (identified by RDT 09/08/2000)

Lespedeza virginica (L.) Britton (SPL 17176)
Medicago lupulina L.* (GLG 461)
Melilotus indicus (L.) All.* (LRR 2033)
Melilotus officinalis (L.) Pallas* (LRR 1725)
Mimosa nuttallii (DC.) B.L. Turner (GLC 536, LWC 157)
Mimosa strigillosa Torrey & Gray (LRR 702)
Neptunia lutea (Leavenworth) Benth. (GLG 553, LRR 1276)
Rhynchosia latifolia Nutt. (GLG 593)
Robinia hispida L.* (SG s.n.)
Senna marilandica (L.) Link (RDT 167066)
Strophostyles helvola (L.) Elliot (RDT 167062)
Strophostyles umbellata (Muhl. ex Willd.) Britton (LRR 779)
Stylosanthes biflora (L.) BSP. (GLG 539, LRR 780, RDT 167031)
Tephrosia virginiana (L.) Pers. (DTM 462)†
Trifolium dubium Sibth.* (RDT 170105)
Trifolium incarnatum L.* (LRR 1903)
Trifolium repens L.* (GLG 491, LRR 1904)
Trifolium resupinatum L.* (LRR 1907)
Vicia minutiflora D. Dietr. (PJB 45)
Vicia tetrasperma (L.) Schreb.* (RDT 170074)
Vicia villosa Roth ssp. *varia* (Host) Corb.* (RDT 170073)

Fagaceae: Beech Family
Fagus grandifolia Ehrh. var. *caroliniana* (Loudon) Fernald & Rehder▪
Quercus alba L. (LRR 1342)
Quercus falcata Michx. (LRR 1279)
Quercus lyrata Walt. (LRR 2044)
Quercus margarettae Ashe ex Small (RDT 167037)
Quercus marilandica Münchh. (LRR 1321, RDT 167033)
Quercus michauxii Nutt. (LRR 1329)
Quercus nigra L. (LRR 1283, 1998)
Quercus pagoda Raf. (JMK s.n.)
Quercus phellos L. (LRR 1292)
Quercus rubra L. (LRR 154)
Quercus shumardii Buckley (LMH 8609, RDT 166955)
Quercus similis W.W. Ashe (JMK s.n.)
Quercus stellata Wangenh. (GLG 409, LRR 1286, 1922)
Quercus velutina Lam. (LRR 145, 1079)

Gelsemiaceae: Jessamine Family
Gelsemium sempervirens (L.) J. Saint-Hilaire (DTM 270, LRR 644)

Gentianaceae: Gentian Family
Sabatia angularis (L.) Pursh (GLG 615, LWC 162)
Sabatia campestris Nutt. (GLG 562, LRR 1266, 1720)
Zeltnera texensis (Griseb.) Mans. ex Pringle (LRR 1724, RDT 170111)

Geraniaceae: Geranium Family
Geranium carolinianum L. (GLG 507, LRR 792)
Geranium dissectum L.* (GLG 510, LRR 791, 1226, 1909)

Grossulariaceae: Currant Family
Ribes curvatum Small (RDT 170081)

Haloragaceae: Water-milfoil Family
Proserpinaca palustris L. (JMK s.n.)

Hamamelidaceae: Witch-hazel Family
Hamamelis virginiana L.▪

Hippocastanaceae: Horse-Chesnut Family
Aesculus pavia L. (GLG 446, LRR 788)

Hydrangeaceae: Hydrangea Family
Hydrangea barbara (L.) B. Schulz▪†
Hydrangea quercifolia Bartram▪

Hydroleaceae: Hydrolea Family
Hydrolea ovata Nutt. ex Choisy (GLG 649, LRR 1580)
Hydrolea uniflora Raf. (LRR 141, 682, 1358)

Hydrophyllaceae: Waterleaf Family
Phacelia glabra Nutt. (DTM 354, LRR 1906)

Hypericaceae: St. John's-wort Family
Hypericum apocynifolium Small (LRR 1275, 1291)
Hypericum frondosum Michx. (LWC 169, LRR 2036)
Hypericum hypericoides (L.) Crantz (DTM 166, 558, LRR 777, 1590)
Hypericum mutilum L. (JMK s.n.)
Hypericum punctatum Lam. (DTM 89, LRR 1253, RDT 167028)
Triadenum walteri (J.F. Gmel.) Gleason (RDT 167011)

Illiciaceae: Star-anise Family
Illicium floridanum J. Ellis▪

Iteaceae: Sweetspire Family
Itea virginica L.▪†

Juglandaceae: Walnut Family
Carya aquatica (F. Michx.) Elliott (LRR 2020)
Carya cordiformis (Wangenh.) K. Koch (GLG 503, LRR 151, 1302, 1677)
Carya glabra (Mill.) Sweet (RDT 170092)
Carya illinoinensis (Wangenh.) K. Koch (RDT 167064)
Carya texana Buckley (LRR 2010)
Carya tomentosa (Lam.) Nutt. (LRR 1294, 1678, RDT 166959)
Juglans nigra L. (LRR 1679)

Lamiaceae: Mint Family
Callicarpa americana L. (LRR 148, 1280, 1710, 1995)
Hedeoma hispida Pursh (GS 142)
Lamium amplexicaule L.* (LRR 1540)
Lycopus rubellus Moench (DTM 682)

Monarda fistulosa L. (GLG 543, LWC 163, 170, RDT 170106)
Monarda punctata L. (DTM 584, LRR 1574, RDT 167035, SPL 17174)
Perilla frutescens (L.) Britton* (RDT 166952)
Physostegia virginiana (L.) Benth.▪†
Prunella vulgaris L.* (GLG 502)
Pycnanthemum albescens Torrey & Gray (GLG 651, LRR 1573, RDT 167034, SPL 17175)
Pycnanthemum muticum (Michx.) Pers. (RDT 167061)
Pycnanthemum tenuifolium Schrad. (DTM 487, LWC 184, LRR 705, 761, 1258)
Salvia azurea Michx. ex Lam.▪†
Salvia lyrata L. (DTM 299, GLG 466, LRR 729)
Scutellaria integrifolia L. (LRR 1251)
Scutellaria parvula Michx. (GLG 543, LWC 65)
Teucrium canadense L. (LRR 1577)

Lauraceae: Laurel Family
Lindera benzoin (L.) Blume (LRR 1288, LMH 8617)
Sassafras albidum (Nutt.) Nees (LRR 1289)

Linaceae: Flax Family
Linum curtissii Small (GLG 563)
Linum striatum Walt. (RDT 170116)

Linderniaceae: False-pimpernel Family
Lindernia dubia (L.) Pennell (GLG 631)

Loganiaceae: Strychnine Family
Mitreola petiolata (J.F. Gmel.) Torrey & Gray (DTM s.n., 201, LRR 1362, RDT 167018)
Spigelia marilandica (L.) L.▪

Lythraceae: Loosestrife Family
Ammannia coccinea Rottb. (RDT 166981)
Cuphea carthagenensis (Jacq.) J.F. Macbr.* (JMK s.n.)
Lythrum lanceolatum Elliott (LRR 1585)

Magnoliaceae: Magnolia Family
Liriodendron tulipifera L.▪†
Magnolia grandiflora L. (LRR 2112)
Magnolia macrophylla Michx.▪†

Malvaceae: Mallow Family
Callirhoe papaver (Cav.) A. Gray▪†
Hibiscus lasiocarpos Cav.▪
Malvaviscus drummondii Torrey & Gray▪
Modiola caroliniana (L.) G. Don (DTM 389, LRR 790)
Sida rhombifolia L. (DTM 536)
Tilia americana L. var. *caroliniana* (Mill.) Castigl. (LRR 539, 787, 1309)

Mazaceae: Mazus Family
Mazus pumilus (Burm. f.) Steenis* (RDT 166972)

Melastomataceae: Melastome Family
Rhexia mariana L. (LRR 1398, 1572, 1709)

Meliaceae: Mahogany Family
Melia azedarach L.* (LRR 540, 786, 1351)

Menispermaceae: Moonseed Family
Nephroia carolina (L.) Lian & Wang (LRR 2019)

Mollluginaceae: Carpetweed Family
Mollugo verticillata L. (identified by JMK 7/13/2020)

Montiaceae: Montia Family
Claytonia virginica L. (PJB 52, LRR 615, 727)

Moraceae: Mulberry Family
Fatoua villosa (Thunb.) Nakai* (RDT 166976)
Morus rubra L. (LRR 1282)

Myricaceae: Bayberry Family
Morella cerifera (L.) Small (LRR 1997)

Nyssaceae: Tupelo Family
Nyssa sylvatica Marshall (GLG 570, LRR 1311)

Oleaceae: Olive Family
Chionanthus virginicus L. (GLG 471, 569, LRR 544, 1307, 1434, 1676)
Forestiera ligustrina (Michx.) Poir. (LRR 155, 1942, RDT 167042)
Fraxinus americana L. (LRR 152, 1281, 1917, 2015, LMH 8613)
Fraxinus pennsylvanica Marshall (JMK s.n.)
Ligustrum japonicum Thunb.* (LRR 2158)
Ligustrum sinense Lour.* (LRR 1203)

Onagraceae: Evening-primrose Family
Ludwigia alternifolia L. (GLG 577, LRR 1274)
Ludwigia decurrens Walt. (DTM 617, LRR 679, SPL 17212)
Ludwigia glandulosa Walt. (RDT 166987)
Ludwigia hirtella Raf. (LRR 1274)
Ludwigia palustris (L.) Elliot (identified by RDT 09/08/2000)
Oenothera biennis L. (RDT 166995, LRR 1703)
Oenothera filiformis (Small) Wagner & Hoch (RDT 167029, SPL 17237)
Oenothera laciniata Hill (RDT 170101)
Oenothera linifolia Nutt. GLG 541, LRR 2146)
Oenothera spachiana Torrey & Gray (DTM 967)†

Orobanchaceae: Broomrape Family
Agalinis fasciculata (Elliot) Raf. (SPL 17187)
Agalinis heterophylla (Nutt.) Small (DTM 754)
Agalinis tenuifolia (Vahl) Raf. (LRR 1890, RDT 167039, SPL 17188)
Aureolaria grandiflora (Benth.) Pennell (LRR 553)†
Pedicularis canadensis L. (DTM 37, 298, GLG 427, 459)

Oxalidaceae: Wood-sorrel Family
Oxalis dillenii Jacq. (JMK 6/15/2020)
Oxalis stricta L. (GLG 463, LRR 1548, RDT 170099)
Oxalis violacea L. (LJB 111, LRR 1547, MM 6209)

Papaveraceae: Poppy Family
Sanguinaria canadensis L.▪

Passifloraceae: Passionflower Family
Passiflora incarnata L. (GLG 617)
Passiflora lutea L. (GLG 616, LRR 1316)

Paulowniaceae: Paulownia Family
Paulownia tomentosa (Thunb.) Siebold & Zucc. ex Steud.* (JMK s.n.)

Phrymaceae: Lopseed Family
Mimulus alatus Aiton (GLG 652, LRR 772, RDT 167010)
Phryma leptostachya L. (LRR 798, 1680)

Phyllanthaceae: Leaf-flower Family
Emblica urinaria (L.) R.W. Bouman* (RDT 166975)
Phyllanthus caroliniensis Walt. (RDT 167009, SPL 17208, 17209)

Phytolaccaceae: Pokeweed Family
Phytolacca americana L. (LRR 1263)

Plantaginaceae: Plantain Family
Callitriche heterophylla Pursh (RDT 170089)
Callitriche terrestris Raf. (JMK s.n.)
Gratiola neglecta Torrey (DTM 398, RDT 170093)
Gratiola virginiana L. (PJB 43)
Linaria canadensis (L.) Dumont de Courset (JMK s.n.)
Mecardonia acuminata (Walt.) Small (DTM 216, RRH 5325, SPL 17196)
Penstemon digitalis Nutt. ex Sims (GLG 554, LRR 1189)
Penstemon laxiflorus Pennell (JMK s.n.)
Plantago aristata Michx. (RDT 170113)
Plantago lanceolata L.* (RDT 170114)
Plantago virginica L. (GLG 544, LRR 1206, GS 123)

Platanaceae: Plane-tree Family
Platanus occidentalis L. (LRR 2156)

Polemoniaceae: Jacob's-ladder Family
Phlox pilosa L. (GLG 501, LRR 1270)
Phlox divaricata L. var. *laphamii* Alph. Wood▪

Polygalaceae: Milkwort Family
Polygala mariana Mill. (RDT 170119)
Polygala sanguinea L. (DTM 461, LRR 2043)

Polygonaceae: Smartweed Family
Brunnichia ovata (Walt.) Shinners (LRR 1322)
Persicaria hydropiperoides (Michx.) Small (LRR 1212, 1589, 1714)
Persicaria longiseta (de Bruijn) Kitag.* (RDT 170115)
Persicaria maculosa Gray* (LRR 681, SPL 17241)
Persicaria punctata (Elliott) Small (LRR 1714)
Persicaria setacea (Baldw.) Small (JMK s.n.)
Persicaria virginiana (L.) Gaertn. (LRR 143, 1598, SPL 17183)
Rumex crispus L.* (RDT 170079)
Rumex hastatulus Baldw.* (LRR 1205)
Rumex pulcher L.* (RDT 170080, identified by JMK 5/27/2020)

Portulacaceae: Purslane Family
Portulaca oleracea L.* (RDT 166970)

Primulaceae: Primrose Family
Primula meadia (L.) Mast & Reveal (GLG 499, LMH 8840)†
Steironema lanceolatum (Walt.) Gray (GLG 565, 595; RDT 170096; LRR 2035)
Samolus parviflorus Raf. (LRR 1878)

Ranunculaceae: Buttercup Family
Aquilegia canadensis L.*▪†
Delphinium carolinianum Walt. (GLG 535, LRR 1250)
Ranunculus abortivus L. (JMK s.n.)
Ranunculus fascicularis Muhl. ex Bigelow (GLG 399, 462)
Ranunculus pusillus Poir. (DTM 292)
Ranunculus recurvatus Poir. (LWC 66)
Ranunculus sardous Crantz* (LRR 789, 1191)
Thalictrum dasycarpum Fisch. & Avé-Lall. (LRR 1914, RDT 170090)

Rhamnaceae: Buckthorn Family
Berchemia scandens (Hill) K. Koch (LRR 1262)
Ceanothus americanus L. (LRR 1243)†
Frangula caroliniana (Walt.) A. Gray (LRR 1332, LRR 1963, LMH 8646)

Rosaceae: Rose Family
Agrimonia rostellata Wallr. (RDT 166954)
Crataegus berberifolia Torrey & Gray (LRR 1348)
Crataegus brachyacantha Sarg. & Engelm. (LRR 545)
Crataegus crus-galli L. (LRR 147, 2002)
Crataegus marshallii Eggl. (PJB 50, LRR 1347, 1433)
Crataegus opaca Hook. & Arn.▪
Crataegus spathulata Michx. (LRR 153, RDT 166963)
Crataegus viridis L. (JMK s.n.)
Geum canadense Jacq. (LRR 1877, RDT 170075)
Gillenia stipulata (Muhl. ex Willd.) Nutt. (LRR 1230, 2111)†
Potentilla indica (Andrews) T. Wolf * (LRR 1190)
Potentilla simplex Michx. (DTM 388, LRR 751)
Prunus caroliniana (Mill.) Aiton▪
Prunus mexicana S. Wats. (LRR 543, 632)
Prunus serotina Ehrh. (PJB 47, SPL 4153)

Prunus umbellata Elliott (RRH 4570, LRR 638)
Rosa carolina L. (GLG 561)†
Rosa multiflora Thunb. ex Murray* (RDT 170107)
Rosa setigera Michx. (LRR 1240)
Rubus argutus Link (LRR 1719, 2006)
Rubus trivialis Michx. (GLG 444, MM 6207)

Rubiaceae: Madder Family
Cephalanthus occidentalis L. (GLG 608, LRR 1361)
Diodia virginiana L. (GLG 594, LRR 1364, LWC 180, RDT 167051)
Galium circaezans Michx. (identified by JMK 7/01/2020)
Galium obtusum Bigelow (identified by JMK 5/20/2020)
Galium sherardia E.H.L. Krause* (LRR 1908)
Galium tinctorium L. (DTM 355)
Galium uniflorum Michx. (RDT 170082, JMK s.n.)
Hexasepalum teres (Walt.) J.H. Kirkbr. (GLG 603, LRR 1412, 1579, 2057)
Houstonia micrantha (Shinners) Terrell (RRH 4572, GLG 431)
Houstonia pusilla Schöpf (GLG 432, LRR 619, 741)
Mitchella repens L. (DTM 378, GLG 511)
Oldenlandia boscii (DC.) Chapm. (RDT 167016)
Spermacoce glabra Michx. (LRR 781)

Ruscaceae: Ruscus Family
Liriope spicata Lour.* (JMK s.n.)

Rutaceae: Citrus Family
Ptelea trifoliata L. (RDT 170085)
Zanthoxylum clava-herculis L. (LRR 1319)

Salicaceae: Willow Family
Populus deltoides Bartram ex Marshall (LRR 1284, 1915)†
Salix nigra Marshall (RDT 167046, LRR 2025)

Sapotaceae: Sapodilla Family
Sideroxylon lanuginosum Michx. (LRR 1336, LMH 8618)

Saururaceae: Lizard's-tail Family
Saururus cernuus L. (GLG 598, LRR 1301)

Saxifragaceae: Saxifrage Family
Heuchera americana L. (RRH 5763, LRR 1565, RDT 88266)

Solanaceae: Nightshade Family
Physalis heterophylla Nees (LRR 2184)
Solanum carolinense L. (LRR 756, 1402, 1708)
Solanum pseudocapsicum L.* (LRR 2114)

Styracaceae: Storax Family
Halesia diptera J. Ellis▪

Tetrachondraceae: (Tetrachondra Family)
Polypremum procumbens L. (RDT 167005)

Thymelaeaceae: Mezereum Family
Dirca palustris L.▪†

Ulmaceae: Elm Family
Planera aquatica (Walt.) J.F. Gmel. (LMH 8468, 8647)
Ulmus alata Michx. (LRR 617, 1343)
Ulmus americana L. (RDT 48007)
Ulmus crassifolia Nutt. (LRR 1340, LMH 8610, SPL 17222)
Ulmus rubra Muhl. (LRR 1308, 1331, 1339)

Urticaceae: Nettle Family
Boehmeria cylindrica (L.) Sw. (LRR 684)
Parietaria pensylvanica Muhl. ex Willd. (RDT 170084)†
Pilea pumila (L.) A. Gray (SPL 17193, 17211)

Valerianaceae: Valerian Family
Valerianella radiata (L.) Dufr. (LRR 793)

Verbenaceae: Verbena Family
Glandularia canadensis (L.) Nutt. (GLG 429)
Phyla lanceolata (Michx.) Greene (RDT 166971, LRR 1971)
Verbena brasiliensis Vell.* (LRR 1581, 2031)
Verbena rigida Spreng.* ▪ †
Verbena urticifolia L. (RDT 166945)†

Viburnaceae: Viburnum Family
Sambucus canadensis L. (GLG 607, LRR 1257)
Viburnum scabrellum (Torrey & Gray) Chapm.▪
Viburnum rufidulum Raf. (GLG 468, LRR 1295, LMH 8837)

Violaceae: Violet Family
Viola missouriensis Greene (DTM 785,787, LRR 743)
Viola palmata L. var. *palmata* (DTM 294, LRR 749)
Viola pubescens Aiton▪†
Viola sagittata Aiton (SPL 4146)†
Viola sororia Willd. (JMK s.n.)
Viola walteri House (GLG 413, LRR 1989, RDT 170098)
Viscaceae: Christmas Mistletoe Family
Phoradendron leucarpum (Raf.) Reveal & Johnst. (LRR 2083)

Vitaceae: Grape Family
Ampelopsis cordata Michx. (RDT 170088)
Muscadinia rotundifolia (Michx.) Small (MM 6201, LRR 1993, 2013)
Nekemias arborea (L.) Wen & Boggan (LRR 1721)
Parthenocissus quinquefolia (L.) Planch. (MM 6208, LRR 2011)
Vitis aestivalis Michx. (RDT 166,953, LRR 2012)
Vitis cinerea (Engelm.) Engelm. ex Millard (identified by RDT 09/08/2000)
Vitis palmata Vahl (RDT 167044)†
Vitis riparia Michx. (RDT 170117)

Appendix 2. Vegetation Classification.

Dichotomised below are the types of vegetation (i.e. plant communities, habitats, cover types) which can be most easily distinguished within the Park. All are in need of dedicated sampling, but interesting patterns are revealed by those species which inhabit only one or two of the terminal categories. Each type is described roughly from the soil upward (the primary soil series mapped are underlined). Species which are rare or uncommon in the region are listed in parentheses unless they are abundant enough to characterize the type as a whole. The nearest equivalent, the United States National Vegetation Classification, is provided for comparison.

The flora of the Park can be characterized within the following hierarchical ecoregions: Eastern Temperate Forest, Southeastern USA Plains, South Central Plains, and Tertiary Uplands (Daigle et al. 2006).

1. Pine-Oak-Hickory- Forests or woodlands from lower slopes to ridgetops. Better drained and topographically higher than other communities.

1.1. Mesic

1.1.1. Loblolly Pine-Mixed Hardwood- Guyton, Metcalf-Timpson, Eastwood, Bernaldo soils. Middle to lower slopes. *Parthenocissus quinquefolia*, *Toxicodendron radicans*, *Lonicera sempervirens*, *Chasmanthium sessiliflorum*, *Sanicula canadensis*, *Dioscorea villosa*, *Solidago rugosa aspera*, *Callicarpa americana*, *Vaccinium virgatum*, *Ostrya virginiana*, *Acer floridanum*, *Sideroxylon lanuginosum*, *Carya tomentosa*, *Quercus alba*, *Q. pagoda*, *Q. velutina*, *Liquidambar styraciflua*, and *Pinus taeda*. (*Stenanthium gramineum*, *Primula meadia*, *Hypopitys monotropa*, *Ribes curvatum*, *Neottia bifolia*, *Erythrina herbacea*). ≈Loblolly Pine - Shortleaf Pine - Oak species Forest & Woodland Group.

1.2. Dry-Mesic

1.2.1. Shortleaf Pine-Oak-Hickory- Today mostly closed, this type would have likely been open and pyrophytic historically. Eastwood and Bernaldo soils. Upper slopes and ridgetops. *Danthonia spicata*, *Dichanthelium ravenelii*, *Endodeca reticulata*, *Toxicodendron radicans*, *Vitis aestivalis*, *Vaccinium arboreum*, *V. stamineum*, *Callicarpa americana*, *Ilex vomitoria*, *Quercus margaretta*, *Q. marilandica*, *Q. stellata*, *Q. falcata*, *Carya texana*, *C. tomentosa*, and *Pinus echinata*. (*Gillenia stipulata*, *Rudbeckia grandiflora var. grandiflora*, *Heuchera americana*, *Silphium radula*). ≈Loblolly Pine - Shortleaf Pine - Oak species Forest & Woodland Group.

2. Riparian hardwoods-Forests from streambanks to lower slopes (i.e. floodplains). Somewhat-well to poorly drained and level or slightly rolling, and sometimes mounded or channel-scarred.

2.1. Wet

2.1.1. Palmetto Flatwoods- Guyton and Metcalf-Timpson soils. *Bignonia capreolata*, *Sabal minor*, *Ageratina altissima*, *Arundinaria gigantea*, *Ilex decidua*, *Acer rubrum drummondii*, *Quercus lyrata*, *Q. nigra*, *Carya aquatica*, *Ulmus americana*, *U. crassifolia*., *Celtis laevigata*. (*Symphoricarpos orbiculatus*, *Corallorhiza wisteriana*). ≈Swamp Chestnut Oak - Laurel Oak - Sweetgum Floodplain Forest Group.

2.1.2. Forested Depression Pool- Guyton soils. *Triadenum walteri*, *Lycopus virginicus*, *Saururus cernuus*, *Diospyros virginiana*, *Nyssa sp.*, *Cephalanthus occidentalis*, *Agrostis perennans*, *Mimulus alatus*, *Carex spp.*, *Sabal minor*, *Dichanthelium microcarpon*, *Chasmanthium spp.*, *Boehmeria cylindrica*, and

Proserpinaca palustris. *Lemna valdiviana* is present in some examples. ≈Eastern North American Vernal Pool Alliance.

2.2. Wet-Mesic

2.2.1. Near-Vertical Streambank- Guyton soils. *Atrichum angustatum, Plagiomnium ciliare, Thuidium delicatulum, Athyrium felix-femina, Polystichum acrostichoides, Onoclea sensibilis, Sphenopholis nitida, Lobelia cardinalis, Luzula echinata, Dichanthelium laxiflorum, Mimulus alatus, Symphyotrichum texanum, Zizia aurea,* and *Penthorum sedoides*. ≈Southeast Coastal Plain Cliff Alliance.

2.3. Mesic

2.3.1. Small Stream Forest- Guyton and Bernaldo soils. *Viola missouriensis, Carex abscondita, Sceptridium biternatum, Dichanthelium commutatum, Sanicula canadensis, Podophyllum peltatum, Mitchella repens, Geum canadense, Passiflora lutea, Elephantopus carolinianus, Arisaema dracontium, Asimina triloba, Muscadinia rotundifolia, Ostrya virginiana, Carpinus caroliniana, Acer floridanum, A. rubrum rubrum, Sassafras albidum, Quercus shumardii, Q. michauxii, Q. alba, Q. nigra, Q. pagoda, Carya cordiformis, Juglans nigra, Fraxinus americana, Nyssa sylvatica, Ulmus alata, Liquidambar styraciflua, Pinus taeda*. (*Triphora trianthophoros, Malaxis unifolia, Solidago auriculata, Silene stellata, Viola walteri, Ptelea trifoliata, Symphyotrichum texanum, Ribes curvatum, Botrypus virginiana, Agrimonia rostellata, Phryma leptostachya, Polygonatum biflorum*). ≈Swamp Chestnut Oak - Laurel Oak - Sweetgum Floodplain Forest Group.

3. Grassland openings- Natural, semi-natural, or manmade breaks in forest cover. Tree canopy absent or patchy and stunted with heliophytic ground flora.

3.1. Wet to Wet-Mesic

3.1.1. Sodic Flatwoods and Meadow- These habitats are affected by locally high levels of sodium in the upper soil strata.

3.1.1.1. Flatwoods- Stunted hardwoods, pine mortality, and heliophytic ground flora delineate these sites. Guyton soils. *Climacium americanum, Aulacomnium palustre, Polytrichum commune, Euthamia leptocephala, Galium obtusum, Forestiera ligustrina, Ruellia caroliniensis, Helenium flexuosum, Cinna arundinacea, Chasmanthium latifolium, Quercus similis, Crataegus brachyacantha, Phlox pilosa, Hypericum hypericoides, Elymus virginicus*. ≈Groundsel-tree - Barberry Hawthorn / Spikerush species - Longspike Tridens - Bushy Goldentop Shrubland.

3.1.1.2. Meadow- These are markedly open areas within the flatwoods or areas artificially or inexplicably cleared within them. Guyton soils. *Euthamia leptocephala, Symphyotrichum dumosum, Tradescantia occidentalis, Ruellia humilis, Climacium americanum, Chasmanthium latifolium, Tridens strictus, Iva angustifolia, Juncus spp., Carex annectens, Chamaecrista fasciculata, Neptunia lutea, Lathyrus pusillus, Minuartia muscorum*. (*Eleocharis wolfii, Oenothera spachiana*). ≈Groundsel-tree - Barberry Hawthorn / Spikerush species - Longspike Tridens - Bushy Goldentop Shrubland, Narrowleaf Marsh-elder - Limestone Calamint - Saltgrass West Gulf Coastal Plain Saline & Weches Bedrock Grassland Alliance.

3.1.2. Non-forested Depression Pool– Guyton soils. Ludwigia spp., *Juncus spp., Eleocharis obtusata, Lindernia dubia, Gratiola neglecta, Hypericum*

mutilum, *Glyceria septentrionalis*, *Carex lupulina*, *C. aureolensis*, *Iris shrevei*, *Scirpus cyperinus*, *Dichanthelium scoparium*, *Hydrolea uniflora*, *Rhexia mariana*, *Rhynchospora inexpansa*, *R.corniculata*, and *Callitriche terrestris*. ≈Beaksedge species - Spikerush species - Panicgrass species Atlantic & Gulf Coastal Plain Wet Prairie & Marsh Macrogroup, Bushy Bluestem - Common Rush Ruderal Marsh, Wet Meadow & Shrubland Group.

3.2. Wet-mesic to Dry-mesic Powerline (Woodland Ground Flora)- Mowing (acting in the place of fire) prevents this habitat from developing into a closed canopy forest. Pedants may differentiate between middle to upper slopes, lower to middle slopes, and sandy rises. Eastwood, Guyton, Bernaldo soils, respectively. The first features *Iva angustifolia*, *Schizachyrium scoparium*, *Paspalum plicatulum*, *P. setaceum*, *Dichanthelium sphaerocarpon*, *Liatris pycnostachya*, *Delphinium carolinianum*, *Carex meadii*, *Rudbeckia hirta*, *R. grandiflora*, *Coreopsis tinctoria*, *C. lanceolata*, *Ptilimnium nuttallii*, *Parthenium hispidum*, and *Baptisia nuttalliana*. (*Polytaenia nuttallii*). The second is similar, but it is differentiated by the inclusion of *Vernonia missurica*, *Hypericum sphaerocarpum*, *Carex meadii*, *Arnoglossum plantagineum*, *Agalinis spp*., *Rhexia mariana*, *Penstemon digitalis*, *Verbesina virginica*, *Paspalum floridanum* and *Tripsacum dactyloides*. The sandy rises are relatively distinct; they feature *Pteridium aquilinum*, *Penstemon laxiflorus*, *Crocanthemum carolinianum*, *Solidago dispersa*, *Lechea mucronata*, and *Lespedeza stuevei*. ≈Bushy Bluestem - Common Rush Ruderal Marsh, Wet Meadow & Shrubland Group, Southeastern North American Grassland & Shrubland Division, Broomsedge Bluestem - Annual Ragweed - Canadian Horseweed Eastern Ruderal Grassland Alliance, Loblolly Pine - Shortleaf Pine - Oak species Forest & Woodland Group.