

**A Comprehensive Floristic Inventory, Habitat Assessment and
Plant Community Classification
of the
South Fork Native Plant Preserve,
Van Buren County, Arkansas**



Prepared by Theo Witsell and Brent Baker for the Gates Rogers Foundation

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Introduction

As summarized in its mission statement, the Gates Rogers Foundation, Inc. is “committed to protecting and preserving Arkansas’ native flora and fauna in a manner that ensures and encourages public access, aesthetic appreciation, and an understanding of the importance of biodiversity preservation” (Gates Rogers Foundation 2005). The Foundation was established in 2001 and announced its first project, the South Fork Native Plant Preserve, in 2005. The preserve, located on the South Fork of the Little Red River (Greers Ferry Lake), in Van Buren County, Arkansas, was donated to the Foundation by the late Mr. Victor C. Gates of Choctaw, Arkansas (Gates Rogers Foundation 2005). The Foundation does not intend to have a “hands-off” approach to the preserve, but will conduct ecologically sensitive interpretive development and ecological restoration activities that benefit the biological diversity of the site and serve to further its mission.

Prior to planning for the development and ecological restoration of the preserve, the Gates Rogers Foundation understood the need to have as complete a picture as possible of the botanical biodiversity of the site, including not only the total plant species diversity, but also the location and condition of all the terrestrial and aquatic plant communities (habitats) on the site. To meet this need, the Gates Rogers Foundation contracted with us to conduct a comprehensive floristic inventory, community classification, and habitat assessment. This inventory and assessment included 1) the documentation of all vascular plant species (with voucher specimens whenever possible), 2) documentation and mapping of all significant plant communities, and 3) assessment of the current condition and restoration potential of these communities (contained in a separate report). Field work was conducted from February to November 2005.

Methods

A rough classification and mapping of plant communities were conducted by analyzing aerial infrared digital orthophotographs and U.S. Geological Survey 7.5' topographic data of the study area using ArcView GIS software. Ground truthing of these communities was conducted, new communities were added, and boundaries were redrawn and adjusted based on repeated site visits and GPS points taken throughout 2005 and in March of 2006.

Thorough species inventories were conducted by visiting each community in the study area a minimum of once every two weeks during the growing season. Each plant species encountered was recorded (by community) and a master plant species list was compiled. Habitat codes were assigned for each species in the study area and a relative abundance value assigned at the conclusion of the field surveys. Exotic and invasive species were identified and labeled as such according to the Arkansas Vascular Flora Committee (2006).

Voucher specimens were collected for each species encountered in identifiable condition (typically flowering or fruiting specimens of herbaceous species and mature specimens of woody plants), provided a voucher could be collected without harming small populations, particularly of species that were rare on the site. Specimens were pressed and dried according to standard methods and were mounted onto archival specimen paper for storage in the herbarium of the South Fork Native Plant Preserve, housed at the office of the Gates Rogers Foundation in Clinton, Arkansas.

Populations of plant species of conservation concern were mapped using GPS/GIS technology and detailed information on habitat and associate species were collected. These data will be provided to the Arkansas Natural Heritage Commission for inclusion into their statewide database of elements of special conservation concern.

Description of the Study Area

Location

The South Fork Native Plant Preserve is located in Van Buren County, Arkansas, approximately 5 miles (8 km) southeast of Clinton, 3.5 miles (5.5 km) northeast of Choctaw, 8 miles (13 km) south-southwest of Shirley, and 10 miles (16 km) southwest of Fairfield Bay. The study area is larger than the existing preserve. It includes the existing preserve (owned by the Gates Rogers Foundation), land lying between the existing preserve and Greers Ferry Lake (owned by the U.S. Army Corps of Engineers), and private land to the south of the Foundation land that includes a high quality example of a bedrock-bottom stream with springs, riparian habitat, and sandstone glades along it. The study area encompasses approximately 151 acres (61.3 ha) and falls within the SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 29, the NW $\frac{1}{4}$ of Section 33, and that part of Section 28 that is south and west of Greers Ferry Lake, all within Township 11 North, Range 13 West (T11N, R13W). The site is prominent and easily located on a map or aerial photograph by the large peninsula projecting into the lake from the south shore (Figure 1, Figure 2, Figure 3).

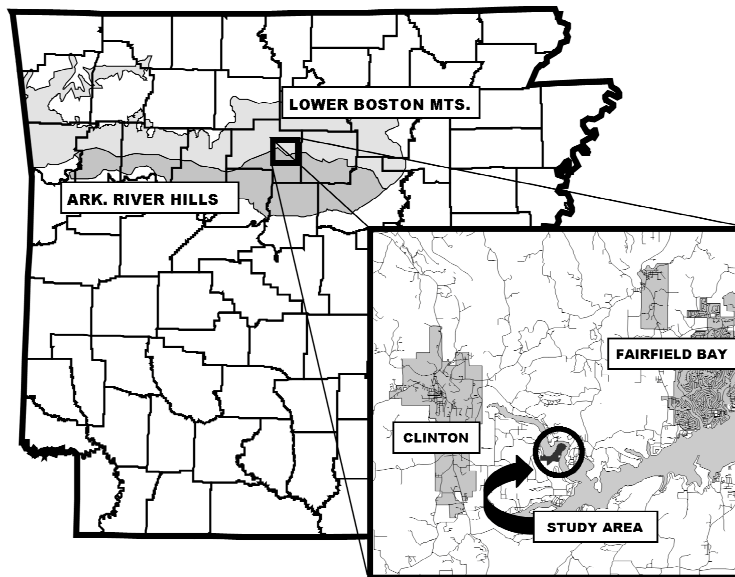


Figure 1. Map showing the location of the study area in eastern Van Buren County, Arkansas. Note placement at the boundary between the Lower Boston Mountains and Arkansas River Hills ecoregions.

Ecoregional Position

The study area (Figure 1) is located at the boundary between the Lower Boston Mountains Ecoregion (Level IV Ecoregion 38b) of the Ozark Plateau and the Arkansas Valley Hills Ecoregion (Level IV Ecoregion 37c) (Woods et al. 2004).

The physiography of the Lower Boston Mountains is characterized by low mountains, rounded high hills, and undulating plateaus. Summer flow in many streams is zero to near zero, but enduring pools fed by interstitial flow endure (Woods et al. 2004). Elevations range from 200 to 2300 feet above sea level. Vegetation is a mosaic of woodland, forest, and savanna that contrasts with the denser, moister, and more closed forests of the Upper Boston Mountains (Woods et al. 2004). Potential natural vegetation is oak-hickory-pine and oak-hickory forests with shortleaf pine especially widespread on drier, south-facing and west-facing slopes underlain by sandstone. Both precipitation and forest density decrease toward the west end of this ecoregion, where oak-pine woodland and savanna become more common (Woods et al. 2004).

The physiography of the Arkansas Valley Hills ecoregion is characterized by hills, valleys, and cuevas, with some scattered low mountains. Elevations range from 250 to 1000 feet above sea level. Potential natural vegetation is mainly oak-hickory forest and oak-hickory-pine forest. Common native trees include blackjack oak, post oak, red oak, white oak, and shortleaf pine. Land use in the more rugged areas is primarily forest, though many areas have been or are being converted to plantation-style forestry, primarily of loblolly pine (not native to the ecoregion). Less rugged areas are dominated by extensive pastureland (Woods et al. 2004).

Elevation

Elevation in the study area ranges from approximately 570 feet (174 m) above sea level at the highest point (near the entrance gate at the corner of Sections 28, 29, 32, & 33), to 461 feet (140.5 m) above sea level at the normal pool elevation of Greers Ferry Lake (Figure 2). During the summer and fall of drier than normal years and in times of heavy rainfall this lowest elevation rises and falls with the lake level and the amount of dry land available to terrestrial plants expands and contracts accordingly. At the lowest lake level of 2005, the study area extended down to 451 feet (137.5 m) above sea level (USACOE 2006). This exposed approximately 25.5 acres (10.3 ha) of dry land in the study area that is under water when the lake is at normal pool elevation.

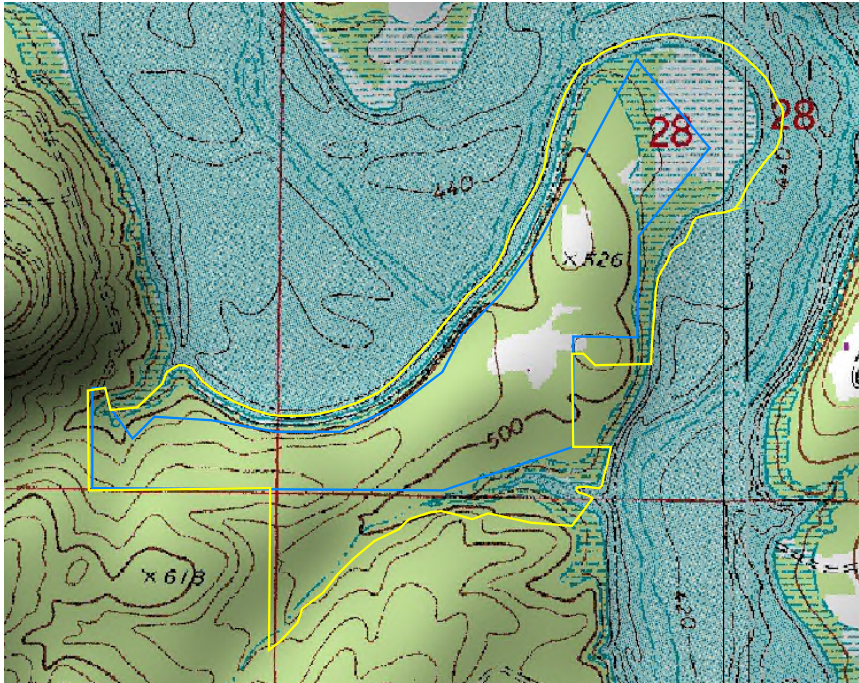


Figure 2. Topographic map showing the study area (yellow polygon) and the South Fork Native Plant Preserve (blue polygon). Contour interval = 20 feet. Topo map = USGS 7.5' hillshade quadrangle (1:24,000 scale) mosaic, downloaded from U of A Monticello Spatial Analysis Lab.

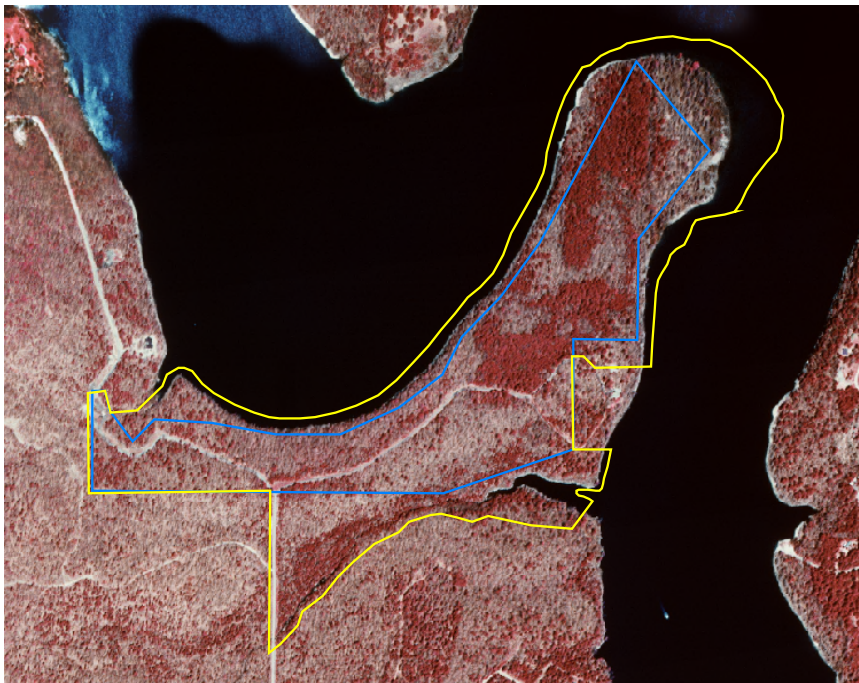


Figure 3. Infrared aerial photograph showing the study area (yellow polygon) and the South Fork Native Plant Preserve (blue polygon). Photo = 2000 Digital Orthophoto Quad (DOQ) mosaic, downloaded from Center for Advanced Spatial Technologies, U of A Fayetteville.

Geology

Haley et al. (1976) map the study area as the Bloyd Shale and Prairie Grove Member of the Hale Formation, and show an area of the Atoka Sandstone to the southwest of the study area (Bald Mountain). Based on the lithologic descriptions of McFarland (2004), it

seems possible that the coarse scale of the map (1:500,000) introduces some error and that the upper geologic units in the study area are perhaps Atoka sandstone underlain by the older Bloyd Shale. The upper elevations, bedrock-bottom stream, and sandstone glades all have tan, brown, or gray sandstone bedrock, which is consistent with the Atoka Formation (McFarland 2004). This is clearly underlain by an older gray shale unit, which is visible on the lower part of the north-facing slope and the area below a waterfall located at the boundary between the sandstone and shale units near the southeastern edge of the preserve where a stream enters Greers Ferry Lake.

Anecdotal information based on plant distribution (e.g. walking fern on a shale outcrop) indicates that the shale unit contains some calcareous material. Similarly, the abundance of a number of acid-loving plants over the sandstone portions of the study area (e.g. shortleaf pine, blueberries [*Vaccinium* spp.], and southern red oak) indicates that this rock does not contain significant amounts of calcareous material. It is possible, however, that this sandstone is part of the Trace Creek Member of the Bloyd Formation which has significant amounts of sandstone and is known to occur as far east as the study area (McFarland 2004). McFarland (2004) also mentions that many modern workers consider the Trace Creek Member to be a part of the Atoka Formation. It is unclear if the Hale Formation outcrops at all in the study area above the present day level of Greers Ferry lake.

The Hale Formation was formed in the Early Pennsylvanian Period and is distributed in the northern Arkansas Ozarks, the Ozark Plateaus, southern Missouri and northeastern Oklahoma. McFarland (2004) describes the Prairie Grove member of the Hale Formation as a light gray to dark brown, limy sandstone or variously sandy limestone with lenses of relatively pure, crinoidal, highly fossiliferous limestone and oolitic limestone. Reported thicknesses of the Hale range from a few feet to 300 feet (McFarland 2004)

The Bloyd Formation was formed in the Early Pennsylvanian Period and is distributed in northern Arkansas in the Ozark Plateaus, and in eastern Oklahoma. The Bloyd is divided into 5 members: Brentwood Limestone Member, Woolsey Member, Dye Shale Member, Kessler Limestone Member, and the Trace Creek Shale Member (McFarland 2004). Based on the range and lithologic descriptions given by McFarland (2004), we suspect that it is the Trace Creek Member of the Bloyd that is present in the study area.

The Atoka Formation was formed in the Pennsylvanian Period and is distributed in the Boston Mountains, Arkansas River Valley, and Ouachita Mountains in Arkansas. It is a sequence of marine, mostly tan to gray silty sandstones and grayish-black shales. Some rare calcareous beds and siliceous shales are known (McFarland 2004). The Atoka is the surface rock of the Boston Mountains and dominates the surface exposures of the Arkansas Valley.

Soils

Soils in the highest elevation uplands in the study area are mapped as Enders-Steprock complex, 8 to 20% slopes (Townsend et al. 1986). Gently sloping areas at lower

elevation are mapped as Steprock-Linker complex, 3 to 8% slopes. Lowlands and a riparian area along the stream in the southern part of the study area are mapped as Steprock-Mountainburg complex, 3 to 8% slopes.

Hydrology

The entire study area lies within the watershed of the South Fork of the Little Red River. Prior to the construction of Greers Ferry Lake, the study area was situated near the south bank of the South Fork at a bend in the river. Following the filling of the lake, the portion of the valley of the South Fork adjacent to the study area was flooded to a depth of 35 to 45 feet (10.5 to 13.5 m) above the normal water level of that river. This also inundated a large area of bottomlands, river terraces, and lower slopes.

On a finer scale, the study area itself contains all or part of four distinct sub-watersheds, based on GIS analysis of 1:24,000 scale USGS topographic data (Figure 4). For the purpose of this report, and because none of the streams have official names on USGS topographic maps, we have named these four watersheds 1) large stream, 2) small stream, 3) peninsula east, and 4) peninsula west. The following table lists the size and topographic relief of each of these four sub-watersheds.

Table 1. Sub-watersheds that drain the study area.

WATERSHED NAME	WATERSHED AREA (in acres)	APPROXIMATE RELIEF OF WATERSHED (in feet)
Large Stream	417	500
Small Stream	134	475
Peninsula East	57	75
Peninsula West	47	120

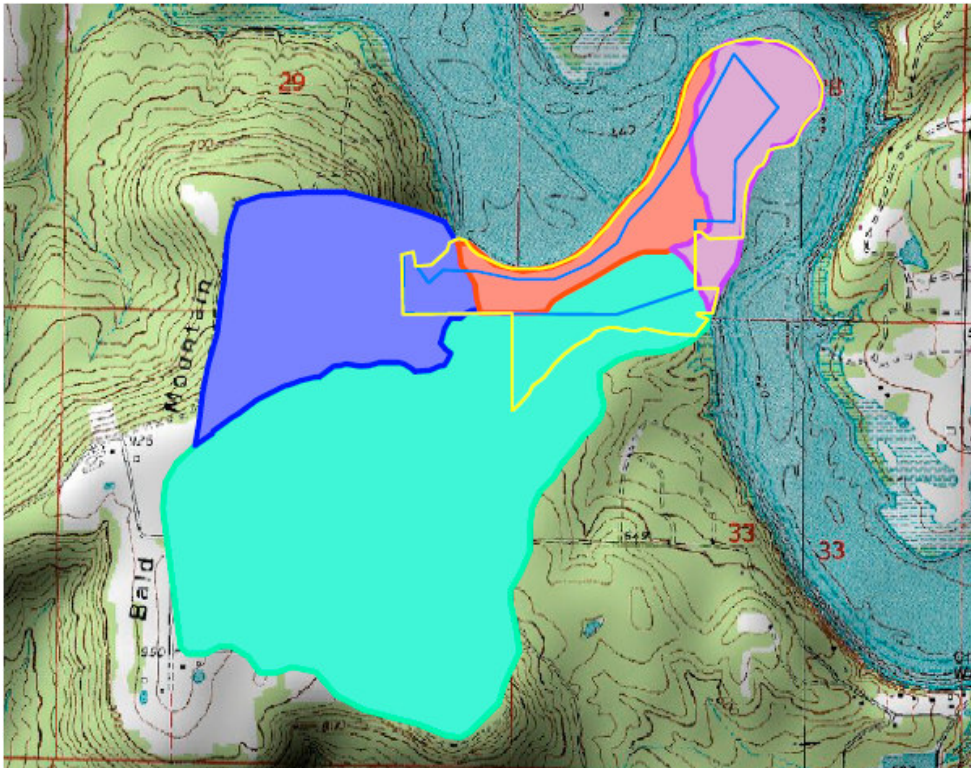


Figure 4. Map showing the four sub-watersheds that drain the study area. Dark blue = small stream, pale blue = large stream, red = peninsula west, and purple = peninsula east.

Of these sub-watersheds, “peninsula east” and “peninsula west” do not have streams with definable channels associated with them. This is due to their small size, relatively minor relief, and narrow shape. Both of these are entirely confined to the study area. The “small stream” and “large stream” watersheds include only small portions of the study area. The “small stream” watershed does have a definable channel for a short distance near its mouth (at the lake), but is steep, does not contain water during most of the year, and has not developed riparian plant communities typical of larger streams.

The only significant stream in the study area is the unnamed stream that drains the “large stream” watershed. This is the only drainage in the study area that shows up as having a stream (indicated by a broken blue line) on the 1:24,000 scale USGS topographic map for the area. The stream flows from southwest to northeast and drains a watershed with an area of approximately 416 acres (168 ha). This watershed ranges from 950 feet (290 m) above sea level at the top of Bald Mountain to 461 feet (140.5 m) at the normal pool elevation of Greer’s Ferry Lake (451 feet [137.5 m] in December 2005). Land use in the watershed of this stream is predominantly low-intensity forestry (selective cut and natural regeneration), with three pastures covering a total of 41 acres (16.6 ha) on top of Bald Mountain in the uppermost reaches of the west end of the watershed. As of 2000, there was just one house in the watershed, located on top of Bald Mountain.

Human History of the Study Area

While we are not aware of any documented evidence of Native American occupation from the study area proper, archaeological evidence of Native American presence in the Ozark Highlands dates back approximately 12,500 years, with evidence indicating widespread occupation by about 10,000 years ago (Nelson 2005). Native American influence on the environment can be attributed to two principle patterns: ecosystem-wide effects from widespread burning of the landscape and local effects resulting from agriculture, hunting, and settlement (Nelson 2005). At least the former of these effects likely played an important role in the shaping of the plant communities in and around the study area prior to the removal of Native Americans and arrival of European settlers.

According to Government Land Office Records, the earliest European settlement in the 36 sq. mile (93.2 sq. km) township containing the study area (T11N, R13W) occurred in areas along the South Fork of the Little Red River, beginning at least as early as 1844. The more rugged and rocky upland areas in the vicinity were not settled until the late 1800s and early 1900s. The first land patent deeded from the government in the four sections surrounding the study area (and among the earliest in the entire township) was a 40 acre tract in the SW ¼ of the NE ¼ of Section 29, just northwest of the study area along the South Fork. This tract was deeded from the government to William Christopher in 1844 (Figure 5). This was followed by three tracts deeded to Jonathan Christopher: an 80 acre parcel in 1856, a 40 acre parcel in 1859 and another 40 acre parcel in 1860 (Rootsweb 2006). Jonathan Christopher’s name first appeared on the Van Buren County tax records in 1837 (Rootsweb 2006). Seven unknown graves from

“Christopher Cemetery” are listed as being relocated from Greers Ferry Lake to Hunter Hill Cemetery (Rootsweb 2006).

The first deeded parcel of land that included part of the study area was an 80 acre tract in the W ½ of the SE ¼ of Section 28 acquired by James Presley in 1860. In 1877 Aaron P. Stevens was deeded a 40 acre tract in the SE ¼ of the NW ¼ of Section 28 and Samuel H. Jordan was deeded a 40 acre tract in the SW ¼ of the NE ¼ of the same section. Both of these tracts included portions of the northern end of the peninsula and were predominantly in the bottoms along the South Fork of the Little Red River. The main part of the study area in Sections 28 and 29 was deeded to James M. Starnes in 1882 (this includes the area with the old house place and old fields). The part of the study area in Section 33 was deeded to Robert W. Newman in 1894.

Cyrus Goldman 1890		Isaac Wheeler 1890	James W. Duncan 1904	James W. Duncan 1904	Harrison E. Jordan 1906	Jesse D. Twiley 1860	Manla W. Blackburn 1901
Augustus B. Moore 1896		William Christopher 1844	Jonathan Christopher 1860	Jonathan Christopher 1859	Aaron P. Stevens 1877	Samuel H. Jordan 1877	Jonathan Christopher 1905
William C. Moore 1910	Miles Suggs 1910	Jonathan Christopher 1856	Jonathan Christopher 1856	James M. Starnes 1882	James Presley 1860	George W. Needham 1919	
William J. Cullum 1904		James M. Starnes 1882			Belle Conklin Belle & Nathan Johnson 1910		
Landy Cupp 1926	Miles Suggs 1910	George W. Ward 1911		Robert W. Newman 1894	James Presley 1860	Henry L. Jennings 1879	
James McGruder 1892		William B. Duncan 1913	John F. Wiley 1889		William R. Stobaugh 1910	Samuel Stephens 1889	
Stephen A. Bates 1897	Margaret C. Yeakley 1899		Margaret C. Yeakley 1899	Worth Dempsey 1909			

Figure 5. Original ownership and the date of transfer of deed from the federal government for the four sections surrounding the study area. The study area outline is shown in orange and parcels containing portions of the study area are color coded according to individual owners.

Construction on the Greers Ferry Dam began in 1959 and was completed in 1962. Construction of the lake drastically altered the landscape along the Little Red River and

its tributaries, inundating an area of approximately 40,500 acres (63.3 square miles), changing the hydrology of the area, destroying plant communities inundated by the lake, altering plant communities along the fringe of the lake, and changing the patterns of animal movement in the area. In addition, the presence of the lake has influenced patterns of development and land use in the region surrounding the lake and is likely to continue doing so into the future. Perhaps no other single event in human history has had a greater effect on the ecology of the area.

While the study area is almost entirely forested today, historical aerial photos reveal that a large portion was cleared for fields as recently as the 1950s (Figure 6). These fields have grown up into young stands of shortleaf pine and eastern redcedar in the uplands and in stands of sweetgum and willow oak in the lowlands at the north end of the peninsula. Several old abandoned roads are still evident in the study area (Figure 7), as well as other signs of past human use including an old house place (now consisting only of a portion of a fireplace and chimney, a very large white oak yard tree, and a hole - presumably the location of a root cellar), an old stone wall, and a large, apparently human-dug hole, presumably a well or prospecting pit (Figure 7).



Figure 6. 1950s era aerial photograph of the study area showing pre-lake landscape. Note the presence and location of fields (modern day location of pine forest stands).

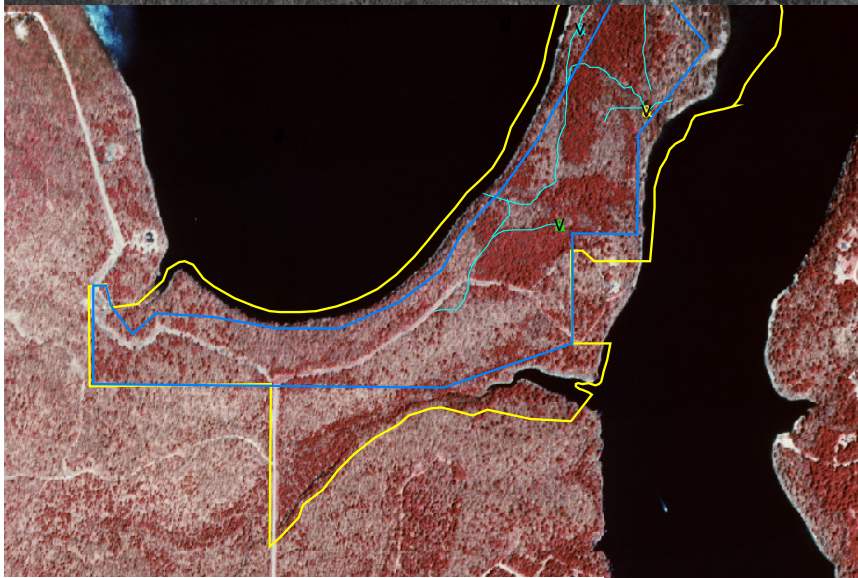


Figure 7. Map showing the location of historical features found within the study area. The green pentagon represents the location of the old house place, the yellow pentagon represents the location of the old stone wall remnant, and the blue

pentagon represents the location of the old pit. Pale blue lines are old abandoned roads. The dark blue polygon is the existing South Fork Native Plant Preserve boundary. The yellow polygon is the study area boundary.

Evidence of past logging can be found in the mixed pine-hardwood forests of the study area. Some of the persisting old stumps are tall enough to be consistent with those left by crosscut saw logging, which is typically thought to have continued into the 1930s or 1940s (McKay pers. comm.). There is no evidence of mining in the study area.

Climate

The nearest known site to the study area for which precipitation data are recorded is the home of Mary Alice Beer at Fairfield Bay. The yearly precipitation total for 2005 was 35.35 inches (89.79 cm), a near record low. This was 15.14 (38.46 cm) inches below the normal amount, 50.49 inches (128.25 cm), averaged over several years at the same site. May, October, and December were particularly dry months with 0.45, 0.92, and 0.29 inches (1.14, 2.34, and 0.74 cm) respectively. The low May total in particular likely had an adverse impact on some plant species, occurring at the height of the growing season. Total precipitation in 2004 (an above average year) was 56.71 inches (144.04 cm).

Table 2. Monthly precipitation for 2005 recorded at Fairfield Bay, Arkansas.

Month	Monthly Precipitation (inches)	Year to Date Precipitation (inches)
January	4.66	4.66
February	2.28	6.94
March	4.67	11.61
April	4.13	15.74
May	0.45	16.19
June	1.64	17.83
July	3.15	20.98
August	4.64	25.62
September	4.86	30.48
October	0.92	31.40
November	3.66	35.06
December	0.29	35.35
Source: Mary Alice Beer, personal communication		

While this low rainfall may have had an adverse impact on some plant species, it was responsible for a lowering of Greer's Ferry Lake, which exposed a larger-than-normal area of shoreline habitat, benefiting plant species that utilize this habitat. The lake dropped to a level of approximately 10 feet (3 m) below the normal pool elevation of 461 feet (140.5 m) above sea level in 2005. The maximum lake level in January was 466.29 feet [143.13 m] (above normal pool elevation), giving a yearly drop of 15.24 feet (4.65

m). Monthly mean lake levels show a more or less steady (with the exception of a small rise in April) drop in the lake level throughout 2005.

Figure 3. 2005 mean monthly levels of Greers Ferry Lake.

Month	Mean Lake Level (feet above sea level)	Maximum Lake Level (feet above sea level)	Minumum Lake Level (feet above sea level)
January	463.69	466.29	461.09
February	461.23	461.58	461.05
March	461.53	463.29	461.04
April	462.65	463.30	462.05
May	461.98	462.49	461.12
June	459.97	461.12	458.80
July	457.85	458.86	456.54
August	454.97	456.56	453.89
September	453.35	453.91	452.89
October	452.43	453.11	451.94
November	451.77	452.01	451.45
December	451.30	451.69	451.05
Source: www.swl-wc.usace.army.mil/mcharts.htm			

Historical Vegetation/General Land Office Survey

A crew of surveyors working for the General Land Office surveyed the section lines that cross the study area on the 8th of June, 1830 (Arkansas Land Commissioner 1999). The crew consisted of George Lewis (deputy surveyor), Joseph & John Roberts (chain carriers), Jesse Adams (marker), and Ambrose Ream (layman) (Arkansas Land Commissioner 1999). . Lewis was not exceptionally descriptive of the land or vegetation but did record the required information describing the general character of the land, the dominant timber species, and the diameter and species of witness trees for section and quarter section posts and included the measurements and species of occasional “line trees” (Tables 4 & 5). He also recorded the exact location and width (measuring in chains and links from section corners) of streams and other landscape features.

According to the 1830 survey notes, the following trees were mentioned:

On a north line between sections 32 and 33:

Table 4. Witness & line trees between sections 32 & 33, T11N R13W, 1830.

Distance from Corner (in chains)	Species as recorded	Probable latin name	Diameter
20.55	Pine	<i>Pinus echinata</i>	12 inches
40.00	Pine	<i>Pinus echinata</i>	20 inches
40.00	Pine	<i>Pinus echinata</i>	18 inches

50.40	Pine	<i>Pinus echinata</i>	20 inches
80.00	Pine	<i>Pinus echinata</i>	20 inches
80.00	Post Oak	<i>Quercus stellata</i>	24 inches
80.00	Post Oak	<i>Quercus stellata</i>	12 inches
80.00	Black Oak	<i>Quercus velutina</i>	24 inches

The land for the first (south) half mile was described as being “rolling and rocky and not fit for cultivation”. The timber was described as “pine and oak” with undergrowth as “oak and hickory”. The land for the second (north) half mile was described as “rolling and stony and not fit for cultivation”. The timber was described as “pine and oak” with undergrowth of “oak sassafras & hickory”. The stream to the south of the GRF land, which was included in the study area, was encountered at 64.5 chains (the same location it occupied 175 years later) and was described as follows “a Brook 6 links wide runs N Easterly”.

The section corner between sections 28, 29, 32, and 33 (listed above at 80 chains) is approximately where Bachelor Road makes the “T” intersection with the southern boundary of the GRF property. The species composition of the forest in the area in 2005 is roughly consistent with the 4 witness trees and land descriptions listed in 1830.

On a line heading west between sections 28 and 33:

Table 5. Witness & line trees between sections 28 & 33, T11N R13W, 1830.

Distance from Corner (in chains)	Species as recorded	Probable latin name	Diameter
39.59	Pine	<i>Pinus echinata</i>	10 inches
39.59	White Oak	<i>Quercus alba</i>	12 inches

The land for the western half mile was described as “rolling and rocky and not fit for cultivation”. The timber was described as “Oak Pine & Cedar” with undergrowth of “Oak Dogwood & briers”. This includes a portion of the study area along the bedrock bottom stream with sandstone glade margins, which accounts for the presence of cedar in the description of timber type. The Little Red River was encountered just before 40 chains, necessitating the ¼ section post to be offset near the eastern bank (now beneath Greer’s Ferry Lake). The bottoms along the Little Red were described as “subject to be overflowed to the depth of from 2 to 4 feet”. The land for the eastern half mile was described as “not fit for cultivation”. The timber was described as “Pine Oak Gum & Hickory” with undergrowth of “Oak Hickory Chinquapin (sic) & briers”. The “chinquapin” referred to was possibly Ozark chinquapin (*Castanea pumila* var. *ozarkensis*) a species that has all but been wiped out from an introduced fungus *Cryphonectria parasitica*, commonly called the chestnut blight. Ozark chinquapin occurs only in the Interior Highlands and was not an uncommon tree prior to the arrival of the blight. Occasional small stump sprouts are still found and fruiting specimens are tracked as an element of special concern by the Arkansas Natural Heritage Commission. None were found in the study area in 2005 despite extensive searching.

It is clear from the date of the survey and from the size of the trees listed that the surveyors encountered the “virgin” old growth forests in the area. Few trees existed in the study area in 2005 in the 20 to 24 inch diameter size class.

Summary of Floristic Diversity

A total of 582 taxa of vascular plants representing 118 families and 336 genera were found in the 150 acre (61.3 ha) study area. Of these 582 taxa, 55 are considered to be introduced, either intentionally or accidentally, to the United States from elsewhere (mostly Europe and Asia). Six species are tracked by the Arkansas Natural Heritage Commission as species of conservation concern in Arkansas. The largest families are the sunflower family [Asteraceae] (69 taxa), the grass family [Poaceae] (63 taxa), the sedge family [Cyperaceae] (51 taxa), and the bean or pea family [Fabaceae] (39 taxa). The largest genera are the caric sedges [*Carex*] (Cyperaceae - 28 taxa), the rosette grasses [*Dichanthelium*] (Poaceae - 11 taxa), the oaks [*Quercus*] (Fagaceae - 9 taxa), the rushes [*Juncus*] (Juncaceae - 9 taxa), the beggar-ticks or tick trefoils [*Desmodium*] (Fabaceae – 8 taxa), the bushclovers [*Lespedeza*] (Fabaceae – 8 taxa), the flatsedges [*Cyperus*] (Cyperaceae – 8 taxa), the goldenrods [*Solidago*] (Asteraceae – 8 taxa), the asters [*Symphyotrichum*] (Asteraceae – 8 taxa), the St. John's worts [*Hypericum*] (Clusiaceae – 8 taxa), and the violets [*Viola*] (Violaceae – 7 taxa).

It should be noted that this total of 582 taxa represents 20.04 % of the total number of vascular plant taxa known from Arkansas (Arkansas Vascular Flora Committee 2006). According to Dr. Edwin Smith's *An Atlas and Annotated List of the Vascular Plants of Arkansas* (1988), this is more taxa than have been documented from 36 of the 75 counties in the state. As far as we know, the inventory of the study area has documented the highest number of vascular plant taxa from any area of comparable size in the history of Arkansas' botanical exploration. This is due in part to the significant habitat diversity of the study area and in part to the thoroughness of the inventory.

As of 1988, Van Buren County was ranked 65th (out of 75 counties) in terms of documented plant diversity, with 443 taxa documented by voucher specimens (Smith 1988). This was increased to a total of 943 taxa based on collection activities of Mary Alice Beer from 1988-1993 (Beer, pers. comm.). Babb (1973) reported 984 taxa from adjacent Cleburne County.

Of the 582 taxa documented, voucher specimens for 537 taxa were collected, leaving 45 species which were observed in the study area, but which were not collected. Some of these species were seen only once (perhaps just as leaves in the early spring) and were never relocated. Others were seen only in sterile (non-flowering/non-fruiting) condition, probably due to lack of sufficient light in many cases. Many other plants aborted flowering, died, or went dormant in the drought periods during the spring and summer (a challenge to those attempting a comprehensive plant inventory!). Some of these missing species have been collected from other sites so that the Gates Rogers Foundation will have a reference specimen for their collection, but the specimens are not actually from the study area. Labels on these specimens note this exception.

Descriptions of Plant Communities in the Study Area

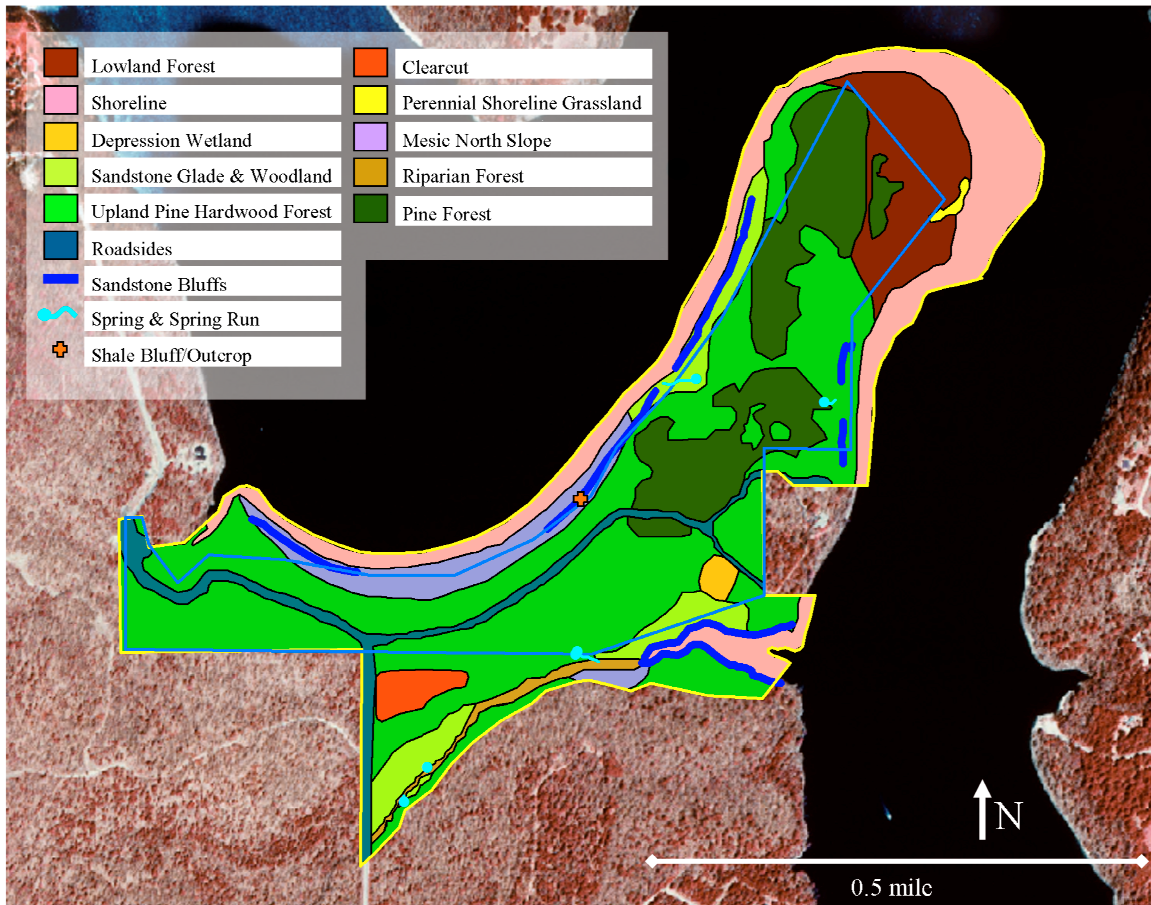


Figure 8. Map of plant communities in the study area. The dark blue polygon is the existing South Fork Native Plant Preserve boundary. The yellow polygon is the study area boundary.

The following plant communities (Figure 8) were identified, mapped, and qualitatively described in the study area:

1) *Lowland Forest*

This community (Appendix A, Figure 10) occurs in flat to nearly flat lowlands at the northeastern end of the peninsula and occupies 11.9 acres (4.8 ha) within the study area. The canopy is dominated by water oak (*Quercus nigra*), willow oak (*Quercus phellos*) and sweetgum (*Liquidambar styraciflua*). Persimmon (*Diospyros virginiana*), green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum* var. *rubrum*) and boxelder (*A. negundo*) are common in localized areas. The understory is dominated by common greenbrier (*Smilax rotundifolia*) and bull greenbrier (*Smilax bona-nox*), with cat greenbrier (*Smilax glauca*) locally common in some areas. Other woody vines include trumpet creeper (*Campsis radicans*), climbing dogbane (*Trachelospermum difforme*), and ladies' eardrops (*Brunnichia ovata*). The herbaceous layer is typically sparse and of low diversity. Where present, it consists primarily of sedges, particularly hop sedge (*Carex*

lupulina), bristlebract sedge (*C. tribuloides*), and cattail sedge (*C. typhina*), and a few species of forbs including lesser marsh St. John's wort (*Triadenum tubulosum*), marsh St. John's wort (*T. walteri*), winter grape fern (*Botrychium biternatum*), cutleaf grape fern (*B. dissectum* f. *obliquum*), creeping eryngo (*Eryngium prostratum*), camphor stinkweed (*Pluchea camphorata*), smooth hedgenettle (*Stachys tenuifolia* var. *tenuifolia*), and purple-headed sneezeweed (*Helenium flexuosum*).

According to historic aerial photos (Figure 6), this community occurs primarily in low areas that were fields as recently as the late 1950s. A dense understory of greenbriers makes this community difficult to walk through in many areas. Much of this community is in an area that is flooded by Greers Ferry Lake for short duration in times of high water levels. Water levels were low during 2005 but high-water levels can be determined by the location of trash and other floating debris deposited by the water.

2) *Shoreline*

The shoreline community (Appendix A, Figure 11) extends from the normal pool level of Greers Ferry Lake to the low-water mark in a given year. The amount of area of this habitat exposed depends on the rainfall in a given year and the amount of water lost from the reservoir through evaporation and discharge through the dam. In 2005 the reservoir level dropped to 451 feet (137.5 m) above sea level, 10 ft (3 m) lower than the normal pool elevation (USACOE, 2006). This exposed approximately 25.5 acres (10.3 ha) of shoreline habitat with 1.75 miles (2.82 km) of water edge within the study area.

By September of 2005, field surveys found that the shoreline community could be divided into 3 distinct concentric "zones" from the edge of the lowland forest to the water's edge. Vegetation patterns in these zones were clearly related to the length of time each zone had been exposed. In addition to these zones, a sandy grassland dominated by perennial grasses, sedges, and forbs was identified in a small area on the east side of the peninsula. The flora of this grassland was distinct enough, and the community persistent enough, that we felt that it deserved recognition as a formal community. It should be noted that each of these zones grades into the next, but that they are extensive and uniform enough to be considered distinct by even a casual observer. However, in a wetter year, not all of the zones are likely to be exposed. It can be assumed that diversity of this community is highest during drought years (because more soil is exposed) and was thus well-expressed in 2005. The following associations were observed on the east side of the peninsula where elevation change was the most gradual:

A) Green ash/silver maple zone

This community occurs in a thin, linear strip at the edge of the normal pool elevation of Greers Ferry Lake. Only species tolerant of short-term inundation can occur here. Scattered trees of silver maple (*Acer saccharinum*) and green ash (*Fraxinus pennsylvanica*) occur here with a shrub layer of buttonbush (*Cephalanthus occidentalis*). Woody vines are common, particularly greenbriers (*Smilax* spp.), trumpet creeper (*Campsis radicans*), climbing dogbane (*Trachelospermum difforme*), and ladies' eardrops

(*Brunnichia ovata*). Ground layer vegetation includes sericea lespedeza (*Lespedeza cuneata*), bull greenbrier (*Smilax bona-nox*), car greenbrier (*Smilax glauca*), forked rosettegrass (*Dichanthelium dichotomum* subsp. *dichotomum*), persimmon (*Diospyros virginiana*), and sweetgum (*Liquidambar styraciflua*) seedlings.

B) Buttonbush zone

This zone is evidently too wet for woody plants other than buttonbush and for most perennial herbaceous plants. Buttonbush (*Cephalanthus occidentalis*) occupies the upper stratum and may occur in thickets or as scattered individual shrubs. An herbaceous layer, when the ground is exposed due to low lake levels, consists mostly of weedy annuals, but includes the emergent perennial water willow (*Justicia americana*) and scattered clumps of rigid panicgrass (*Panicum rigidulum* subsp. *rigidulum*). Common annuals include teal lovegrass (*Eragrostis hypnoides*), a bluet (*Oldenlandia boscii*), Vahl's fimbry (*Fimbristylis vahlii*), slender fimbry (*F. autumnalis*), a nutsedge (*Cyperus squarrosus*), creeping eryngo (*Eryngium prostratum*), false pimpernel (*Lindernia dubia*), toothcup (*Rotala ramosior*), half-chaff sedge (*Lipocarpa micrantha*), and least spike rush (*Eleocharis acicularis*).

C) Recently Exposed Sandy Shoreline

This zone is occupied by a diversity of annual grasses, sedges, and forbs. The only perennial plants in this zone appeared to have germinated during the study year. Dominant species include teal lovegrass (*Eragrostis hypnoides*), a nutsedge (*Cyperus squarrosus*), half-chaff sedge (*Lipocarpa micrantha*), Vahl's fimbry (*Fimbristylis vahlii*), slender fimbry (*F. autumnalis*), and least spike rush (*Eleocharis acicularis*). Other commonly encountered species include toothcup (*Ammania x coccinea*), toothcup (*Rotala ramosior*), a bluet (*Oldenlandia boscii*), pinkweed (*Persicaria pensylvanica*), dotted smartweed (*Persicaria punctata*), pale smartweed (*Persicaria lapathifolia*), barnyard grass (*Echinochloa muricata* var. *microstachya*), winged seedbox (*Ludwigia decurrens*), fall panicgrass (*Panicum dichotomiflorum* subsp. *dichotomiflorum*), whitestar morning glory (*Ipomoea lacunosa*), creeping eryngo (*Eryngium prostratum*), beggar ticks (*Bidens frondosa* var. *frondosa*), and tickseed sunflower (*B. aristosa*).

3) Perennial Shoreline Grassland

This community (Appendix A, Figure 12) occurs in a small area of sandy soil on the eastern side of the peninsula just above the normal pool elevation of the lake. It is essentially treeless though scattered sweetgum (*Liquidambar styraciflua*) and persimmon (*Diospyros virginiana*) saplings and buttonbush (*Cephalanthus occidentalis*) shrubs occur. Rose mallow (*Hibiscus moscheutos* subsp. *lasiocarpus*) is common in this community. The herbaceous layer differs markedly from the other open, shoreline habitat in that it is dominated by perennial species. This community is very wet during periods of high lake levels and very dry in times of low lake levels. As such, it contains a mix of wetland species and species characteristic of xeric, sandy habitats. It can be

considered analogous to sandbar communities along infrequently flooded river terraces. Total area occupied by this community within the study area was 0.35 acre (0.14 ha).

The herbaceous layer is dominated by rigid panic grass (*Panicum rigidulum* subsp. *rigidulum*), big carpetgrass (*Axonopus furcatus*), marsh flatsedge (*Cyperus pseudovegetus*), and purple-headed sneezeweed (*Helenium flexuosum*). Perennial sedges include hop sedge (*Carex lupulina*) and cattail sedge (*Carex typhina*). Other species commonly encountered include poorjoe (*Diodia teres*), field paspalum (*Paspalum leave*), creeping eryngo (*Eryngium prostratum*), climbing dogbane (*Trachelospermum difforme*), doll's daisy (*Boltonia diffusa*), camphor stinkweed (*Pluchea camphorata*), juniperweed (*Polypremum procumbens*), pine-weed (*Hypericum gentianoides*), nits-and-lice (*H. drummondii*), dwarf St. John's wort (*H. mutilum*), marsh St. John's wort (*Triadenum walteri*), sensitive partridge pea (*Chamaecrista nictitans* var. *nictitans*), and yellow flax (*Linum striatum*). Chairmaker's bulrush (*Shoenoplectus pungens*), meadow beauty (*Rhexia mariana* var. *mariana*), wing-stem meadow beauty (*R. virginica*), big carpetgrass (*Axonopus furcatus*), rattlebox (*Crotalaria sagittalis*), and a primrose willow (*Ludwigia glandulosa*) are apparently restricted to this habitat within the study area. Annual grasses and sedges typical of the shoreline community are also common in this community, especially at the lower, eastern end and in areas where perennial species are sparse.

This community is easily discernible on both the 1950s and 2000 aerial photos (Figures 6 & 7). As such, it appears that this community is the result, at least in part, of edaphic factors (perhaps related to the sandy, nutrient-poor soil) and is not entirely the result of periodic flood-related disturbance from the lake.

4) Upland Depression Wetland

This unique community (Appendix A, Figure 13) is represented by a single example within the study area, occupying a total area of approximately 0.79 acre (0.32 ha). This wetland is naturally occurring and is situated in a shallow circular depression in an otherwise upland setting. Drainage is impeded by a low ridge at the south end of the wetland. Shallow, standing water is common during the winter and spring months and in periods of higher rainfall, but the wetland became dry during the summer and in periods of low rainfall.

The wetland is forested and is dominated by sweetgum (*Liquidambar styraciflua*) and water oak (*Quercus nigra*). The shrub layer is sparse but includes species more commonly found in the Gulf Coastal Plain including a species of highbush blueberry (*Vaccinium fuscatum*) and Drummond's red maple (*Acer rubrum* var. *drummondii*). Deciduous holly (*Ilex decidua* var. *decidua*) and maleberry (*Lyonia ligustrina*) also occur in the shrub layer. Bull greenbrier (*Smilax bona-nox*) and common greenbrier (*S. rotundifolia*) are common components of the understory. Plants in the herbaceous layer are typically clump-forming and are concentrated around the edge of the wetland and on raised hummocks within it. Peat moss (*Sphagnum* spp.) and other mosses are common, forming dense mats in the wetter areas.

The herbaceous layer is dominated by a diversity of sedges including *Carex albolutescens*, *C. complanata*, *C. glaucoidea*, *C. vulpinoidea*, Swan's sedge (*C. swanii*), bristlebract sedge (*C. tribuloides*), false hop sedge (*C. lupuliformis*), slender spikerush (*Eleocharis tenuis* var. *verrucosa*), globe beaksedge (*Rhynchospora recognita*), and a bulrush (*Scirpus georgianus*). Rushes and grasses are also common, including soft rush (*Juncus effusus*), autumn bentgrass (*Agrostis perennans*), and cutgrass (*Leersia virginica*). Common forbs include a ragwort (*Packera obovata*), water horehound (*Lycopus rubellus*), slender mountain mint (*Pycnanthemum tenuifolium*), spring beauty (*Claytonia virginica*), rue anemone (*Thalictrum thalictroides*), a bluet (*Hedyotis caerulea*), and partridge berry (*Mitchella repens*). In addition to two sedges of conservation concern (*Carex swanii* & *C. lupuliformis*), several species of orchids are found in and around this wetland including lily-leaf twayblade (*Liparis liliifolia*), green adder's mouth orchid (*Malaxis unifolia*), and nodding ladies' tresses (*Spiranthes cernua*). There is no sign of significant human alteration of this wetland and it shows up as being forested (and wet) in an aerial photo taken some time in the 1950s (Figure 6).

5) Sandstone Glades and Woodlands

Several small glades, all with a sandstone substrate, are found within the study area (Appendix A, Figures 14, 15, & 24). These typically occur on south- and west-facing slopes above bluffs and along both sides of a broad, shallow bedrock bottom stream. These glades grade into open woodlands, which occur on deeper soil surrounding the glades. The total area of all sandstone glade and associated woodland habitat in the study area is approximately 9.1 acres (3.7 ha).

Woodlands surrounding the glades are dominated by post oak (*Quercus stellata*), blackjack oak (*Q. marilandica*), shortleaf pine (*Pinus echinata*), black hickory (*Carya texana*), and eastern red cedar (*Juniperus virginiana* var. *virginiana*). White ash (*Fraxinus americana*), fringe tree (*Chionanthus virginicus*), farkleberry (*Vaccinium arboreum*), gum bumelia (*Sideroxylon lanuginosum*), winged elm (*Ulmus alata*), and dwarf hackberry (*Celtis tenuifolia*) are common small trees which occur scattered in and around the edge of the glades. Common shrubs include fragrant sumac (*Rhus aromatica* var. *aromatica*), winged sumac (*R. copallina*), coralberry (*Symphoricarpos orbiculatus*), and shrubby St. John's wort (*Hypericum prolificum*).

Open areas were dominated by a diversity of warm season grasses including churchmouse three-awn (*Aristida dichotoma* var. *curtissii*), arrowfeather three-awn (*Aristida purpurascens*), dropseed (*Sporobolus clandestinus*), starved rosettegrass (*Dichanthelium depauperatum*), linear-leaved rosettegrass (*D. linearifolium*), purpletop (*Tridens flavus* var. *flavus*), little bluestem (*Schizachyrium scoparium* var. *scoparium*), splitbeard bluestem (*Andropogon ternarius* var. *ternaries*), and broomsedge bluestem (*A. virginicus*). Common forbs include tickseed (*Coreopsis grandiflora*), yellow stargrass (*Hypoxis hirsuta*), nits-and-lice (*Hypericum drummondii*), pine-weed (*H. gentianoides*), bird's foot violet (*Viola pedata*), arrowleaf violet (*V. sagittata*), purple onion (*Allium canadense* var. *mobile*), false garlic (*Nothoscordum bivalve*), rushfoil (*Croton*

wildenowii), prairie tea (*C. monanthogynus*), flowering spurge (*Euphorbia corollata*), slender mountain mint (*Pycnanthemum tenuifolium*), little skullcap (*Scutellaria parvula* var. *australis*), threadleaf evening-primrose (*Oenothera linifolia*), Carolina larkspur (*Delphinium carolinianum* subsp. *carolinianum*), Palmer's saxifrage (*Saxifraga palmeri*), and rose vervain (*Glandularia canadensis*).

Uncommon species restricted to this habitat include one-seeded mercury (*Acalypha monococca*), Engelmann's milkvetch (*Astragalus distortus* var. *engelmannii*), Carolina spring beauty (*Claytonia caroliniana*), pleatleaf knotweed (*Polygonum tenue*), wild hyacinth (*Camassia scilloides*), and Nuttall's pleat-leaf (*Nemastylis nuttallii*).

6) Sandstone Bluffs

Sandstone bluffs (Appendix A, Figure 16) occur in areas where the South Fork of the Little Red River and the unnamed stream at the south end of the study area cut into the hillsides in the past. Within the study area these occur primarily on the north-facing slope, on the west side of the peninsula, and, to a lesser degree, on the east side of the peninsula.

The flora of these bluffs depends on local exposure and hydrology. North-facing and east-facing bluffs support a more mesophytic flora, while south- and west-facing bluffs are drier and support more xerophytic species. More mesic bluffs in the study area support chinquapin oak (*Quercus muhlenbergii*), big-leaved snowbell (*Styrax grandifolius*), American elm (*Ulmus americana*), red maple (*Acer rubrum* var. *rubrum*), musclewood (*Carpinus caroliniana*), yellow honeysuckle (*Lonicera flava*), strawberry bush (*Euonymus americanus*), mountain azalea (*Rhododendron prinophyllum*), wild hydrangea (*Hydrangea arborescens*), mock orange (*Philadelphus pubescens*), and poison ivy (*Toxicodendron radicans*). Herbaceous plants include partridge berry (*Mitchella repens*), American alumroot (*Heuchera americana* var. *americana* & *H. americana* var. *hirsuticaulis*), Palmer's saxifrage (*Saxifraga palmeri*), pellitory (*Parietaria pensylvanica*), green violet (*Hybanthus concolor*), several sedges (*Carex albicans*, *C. oligocarpa*, & *C. umbellata*), wild yam (*Dioscorea villosa*), woodland bluegrass (*Poa sylvestris*), prairie wedgescale (*Sphenopholis intermedia* & *S. obtusata*), ebony spleenwort (*Asplenium platyneuron*), maidenhair spleenwort (*A. trichomanes* subsp. *trichomanes*), resurrection fern (*Pleopeltis polypodioides* var. *michauxiana*), and meadow parsnip (*Thaspium trifoliatum* var. *flavum*).

Drier bluffs support shortleaf pine (*Pinus echinata*), chinquapin oak (*Quercus muhlenbergii*), post oak (*Q. stellata*), fringe tree (*Chionanthus virginicus*), serviceberry (*Amelanchier arborea*), winged elm (*Ulmus alata*), eastern red cedar (*Juniperus virginiana* var. *virginiana*), fragrant sumac (*Rhus aromatica* var. *aromatica*), poison ivy (*Toxicodendron radicans*), maleberry (*Lyonia ligustrina*), and farkleberry (*Vaccinium arboreum*). Herbaceous plants include Buckley's goldenrod (*Solidago buckleyi*), elmleaf goldenrod (*S. ulmifolia* var. *palmeri*), aster (*Symphotrichum anomalum*), nailwort (*Paronychia fastigiata*), goat's rue (*Tephrosia virginiana*), dittany (*Cunila origanoides*), Arkansas beard-tongue (*Penstemon arkansanus*), bird's foot violet (*Viola pedata*), wood

rush (*Luzula echinata*), linear-leaved rosettegrass (*Dichanthelium linearifolium*), and blunt-lobed cliff fern (*Woodsia obtusa*).

7) Shale Bluffs and Outcrops

Shale bluffs (Appendix A, Figure 17) are rare within the study area and are small. The flora of these outcrops is similar to that of the north-facing slope. A small outcrop occurs on the north facing slope, on a small bluff mostly of sandstone. It is the only site within the study area for walking fern (*Asplenium rhizophyllum*), a species typically found on moist limestone rocks.

8) Springs and Spring Runs

Several small intermittent springs and spring runs occur in the study area (Appendix A, Figure 18). These are characterized by lush beds of peat moss (*Sphagnum* spp.), sedges, rushes, and other wetland plants. All of the springs are associated with sandstone bedrock near the surface of the ground, which acts as an impermeable barrier to groundwater and channels it to the point of emergence.

Characteristic species include water horehound (*Lycopus rubellus*), little skullcap (*Scutellaria parvula* var. *australis*), Indian pink (*Spigelia marilandica*), slender spikerush (*Eleocharis tenuis* var. *verrucosa*), Palmer's saxifrage (*Saxifraga palmeri*), partridge berry (*Mitchella repens*), Oklahoma sedge (*Carex oklahomensis*), a rush (*Juncus debilis*), nodding ladies' tresses (*Spiranthes cernua*), autumn bentgrass (*Agrostis perennans*), river oats (*Chasmanthium latifolium*), cutgrass (*Leersia virginica*), quillwort (*Isoetes melanopoda*), spikemoss (*Selaginella eclipses*), bluestar (*Amsonia tabernaemontana*), Pennsylvania bittercress (*Cardamine pensylvanica*), dwarf St. John's wort (*Hypericum mutilum*), and smallflower vetch (*Vicia minutiflora*). Plants restricted to this community within the study area include water starwort (*Callitriche heterophylla* subsp. *heterophylla*), spikemoss (*Selaginella eclipses*), and quillwort (*Isoetes melanopoda*).

9) Roadsides

There are a total of 6.7 acres (2.7 ha) of roads and roadside habitat in the study area (Appendix A, Figure 19). These areas support a mix of weedy species (both native and exotic) and conservative native species dependent on open habitat. This latter suite of species cannot survive, or at least cannot flower, in the closed canopy forests that dominate the study area. This habitat, due to suppression of woody plants by mowing, is dominated by herbaceous species with a significant graminoid component. Common graminoid species include tall fescue (*Schedonorus arundinaceus*), purpletop (*Tridens flavus* var. *flavus*), broomsedge bluestem (*Andropogon virginicus*), autumn bentgrass (*Agrostis hyemalis*), brome (*Bromus* spp.), beaked panicgrass (*Panicum anceps*), rosettegrass (*Dichanthelium* spp.), and several sedges (*Carex cephalophora*, *C. leavenworthii*, *C. hrisutella*, and *C. muehlenbergii* var. *enervis*). A wet area on the west side of Bachelor Road supports a diversity of wetland associated sedges and rushes

including soft rush (*Juncus effusus*), woolgrass bulrush (*Scirpus cyperinus*), a spikerush (*Eleocharis lanceolata*), and a sedge (*Carex vulpinoidea*).

Shrubs are common along the edge of the roadsides and include red maple (*Acer rubrum* var. *rubrum*), sweetgum (*Liquidambar styraciflua*), red buckeye (*Aesculus pavia*), beautyberry (*Callicarpa americana*), shrubby St. John's wort (*Hypericum prolificum*), persimmon (*Diospyros virginiana*), devil's walkingstick (*Aralia spinosa*), fragrant sumac (*Rhus aromatica* var. *aromatica*), winged sumac (*Rhus copallina*), and smooth sumac (*Rhus glabra*).

Forbs in the roadside habitat can be divided into two groups: 1) weedy native and exotic species and 2) conservative native species dependent on open habitat. Weedy species (exotic species noted by an “*”) include wild chervil (*Chaerophyllum tainturieri* var. *tainturieri*), Queen Anne's lace * (*Daucus carota*), rattlesnake weed (*Daucus pusillus*), common ragweed (*Ambrosia artemisiifolia*), lanceleaf ragweed (*A. bidentata*), tickseed sunflower (*Bidens aristosa*), horseweed (*Conyza canadensis*), daisy fleabane (*Erigeron strigosus*), late boneset (*Eupatorium serotinum*), purple cudweed (*Gamochaeta purpurea*), bitterweed (*Helenium amarum*), sweet everlasting (*Pseudognaphalium obtusifolium* subsp. *obtusifolium*), black-eyed Susan (*Rudbeckia hirta* var. *pulcherrima*), oldfield goldenrod (*Solidago nemoralis*), draba (*Draba brachycarpa*), Japanese honeysuckle * (*Lonicera japonica*), chickweed (*Cerastium* spp.), spotted spurge (*Chamaesyce maculata*), Japanese bushclover * (*Kummerowia striata*), clover * (*Trifolium* spp.), common vetch * (*Vicia sativa*), false pennyroyal (*Hedeoma hispida*), lyre-leaved sage (*Salvia lyrata*), plantain (*Plantago* spp.), blackberry (*Rubus* spp.), field madder * (*Sherardia arvensis*), corn speedwell * (*Veronica arvensis*), blue toadflax (*Nuttallanthus texanus*), corn salad (*Valerianella radiata*), and Johnny jump-ups (*Viola bicolor*).

Conservative, light-dependent native species found in roadsides in the study area include butterfly milkweed (*Asclepias tuberosa* subsp. *interior*), gayfeather (*Liatris squarrulosa*), false boneset (*Brickellia eupatorioides* var. *texana*), Baldwin's ironweed (*Vernonia baldwinii*), Missouri ironweed (*V. missurica*), buffalo clover (*Trifolium reflexum*), hairy bushclover (*Lespedeza hirta* var. *hirta*), Virginia bushclover (*Lespedeza virginica*), heartleaf skullcap (*Scutellaria ovata*), wild senna (*Senna marilandica*), pencil flower (*Stylosanthes biflora*), goat's rue (*Tephrosia virginiana*), winged rosepink (*Sabatia angularis*), frosted mountain mint (*Pycnanthemum albescens*), slender mountain mint (*Pycnanthemum tenuifolium*), Texas flax (*Linum medium* var. *texanum*), Carolina larkspur (*Delphinium carolinianum* subsp. *carolinianum*), New Jersey tea (*Ceanothus americanus*), foxglove beard-tongue (*Penstemon digitalis*), whitewand beard-tongue (*P. tubaeflorus*), hairy wild petunia (*Ruellia humilis* var. *humilis*), Bradbury beebalm (*Monarda bradburiana*), beebalm (*M. fistulosa*), and hairy phlox (*Phlox pilosa* subsp. *pilosa*).

Sixteen of the exotic species that occur in the study area were identified as known or potentially invasive species. Fifteen of these occur in this habitat. These species are nodding thistle (*Carduus nutans*), Queen Anne's lace (*Daucus carota*), ox-eye daisy

(*Leucanthemum vulgare*), Japanese honeysuckle (*Lonicera japonica*), bicolor lespedeza (*Lepedeza bicolor*), sericea lespedeza (*Lepedeza cuneata*), beefsteak plant (*Perilla frutescens*), chinaberry (*Melia azedarach*), Chinese privet (*Ligustrum sinense*), meadow brome (*Bromus commutatus*), soft chess (*Bromus hordeaceus* ssp. *hordeaceus*), bald brome (*Bromus racemosus*), orchrd grass (*Dactylis glomerata*), tall fescue (*Schedonorus arundinaceus*), and tree-of-heaven (*Ailanthus altissima*).

10) Upland Pine-Hardwood Forest

This community (Appendix A, Figure 20) forms the matrix in the upland portions of the study area and occupies a total of approximately 63.8 acres (25.8 ha). It is dominated in most areas by mixed species of oaks (*Quercus* spp.) and shortleaf pine (*Pinus echinata*), with mockerut hickory (*Carya tomentosa*), black hickory (*C. texana*), black cherry (*Prunus serotina*), sweetgum (*Liquidambar styraciflua*), white ash (*Fraxinus americana*), and blackgum (*Nyssa sylvatica*) occurring as locally important species. The density of shortleaf pine varies and is likely as much the result of past timber management activities as it is a function of geomorphology, hydrology, or other abiotic factors. However, shortleaf pine is generally more common on south- and west-facing aspects in areas where past timber management is not a deciding factor in distribution and relative abundance.

Patterns of oak distribution in the community are largely a function of slope, aspect, and associated hydrology. White oak (*Quercus alba*) is the dominant oak over most of the area, with black oak (*Q. velutina*) dominant to co-dominant in some areas. Southern red oak (*Q. falcata*) is common to co-dominant, often in areas of shortleaf pine. Drier ridgetops and south- and west-facing slopes are dominated by post oak (*Q. stellata*) and blackjack oak (*Q. marilandica*). Chinquapin oak (*Q. muhlenbergii*) may be locally common but is generally widely scattered in the study area. Northern red oak (*Q. rubra*) may be locally common, particularly on north- and east-facing aspects, but is more common in the mesic north slope hardwood forest.

Common understory species include hop hornbeam (*Ostrya virginiana*), winged elm (*Ulmus alata*), flowering dogwood (*Cornus florida*), Carolina buckthorn (*Frangula caroliniana*), serviceberry (*Amelanchier arborea*), fringe tree (*Chionanthus virginicus*), red buckeye (*Aesculus pavia*), lowbush blueberry (*Vaccinium pallidum*), fragrant sumac (*Rhus aromatica* var. *aromatica*), persimmon (*Diospyros virginiana*), and eastern red cedar (*Juniperus virginiana* var. *virginiana*). The herbaceous layer is fairly diverse but is sparse, due to dense shade under the closed canopy and a thick layer of leaf litter on the forest floor.

11) Shortleaf Pine Forest

This community (Appendix A, Figure 21) occupies an area of approximately 21.3 acres (8.6 ha) and occurs in areas that were fields as recently as the 1950s. It is dominated by shortleaf pine (*Pinus echinata*) with eastern red cedar (*Juniperus virginiana* var. *virginiana*) important to occasionally co-dominant. Southern red oak (*Quercus falcata*)

occurs occasionally in the canopy and more often in the understory. Scattered blackgum (*Nyssa sylvatica*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum* var. *rubrum*), black cherry (*Prunus serotina*), white oak (*Quercus alba*), and black oak (*Q. velutina*) occur as understory trees. Stands of this community type do not appear to have been planted, but to have arisen from natural regeneration following seedfall from surrounding forest remnants. The canopy in this community is dense and continuous. Woody plants in the understory are typically thick, and the herbaceous layer is sparse.

12) Clearcut

This community (Appendix A, Figure 22) is restricted in the study area to a 2 acre (0.81 ha) area near the southern boundary. It is situated on a gentle south-facing slope. Scattered saplings and shrubs dominate a grassy, early successional shrubland. A rich diversity of herbaceous species occurs in this community, receiving abundant sunlight. Common species include broomsedge bluestem (*Andropogon virginicus*), a sedge (*Carex hirsutella*), rosettegrass (*Dichanthelium* spp.), bushclover (*Lespedeza* spp.), fireweed (*Erechtites hieraciifolius* var. *hieraciifolius*), wild quinine (*Parthenium integrifolium*), gayfeather (*Liatris squarrulosa*), tall thistle (*Cirsium altissimum*), horseweed (*Conyza canadensis*), Bradbury beebalm (*Monarda bradburiana*), late boneset (*Eupatorium serotinum*), fragrant goldenrod (*Solidago odora* subsp. *odora*), oldfield goldenrod (*Solidago nemoralis*), black-eyed Susan (*Rudbeckia hirta* var. *pulcherimma*), four-leaved milkweed (*Asclepias quadrifolia*), and woolly mullein (*Verbascum thapsus*).

13) Riparian Forest

This community (Appendix A, Figures 23 & 24) occupies a total area of 1.7 acres (0.7 ha) is restricted to the narrow floodplain, adjacent terraces, and valley bottom along the stream near the southern boundary of the study area. The western portion of the stream within the study area has a wide, shallow bedrock-bottom with sandstone glades and springs along both sides. This area has a different flora than the middle part of the stream within the study area, which is wooded with boulders, cobbles, and gravel in the bed. The eastern part of the stream, just before it flows into Greers Ferry Lake, becomes open again, with streamside seeps, and drops down a 10 ft (3 m) waterfall into the lake.

The forest along the stream is a mix of hardwood species with some shortleaf pine (*Pinus echinata*). Important hardwood trees include red maple (*Acer rubrum* var. *rubrum*), sweetgum (*Liquidambar styraciflua*), white oak (*Quercus alba*), chinquapin oak (*Q. muhlenbergii*), water oak (*Q. nigra*), white ash (*Fraxinus americana*), and sycamore (*Platanus occidentalis*). A diverse understory includes fringe tree (*Chionanthus virginicus*) [concentrated along the stream banks], deciduous holly (*Ilex decidua* var. *deciduas*), musclewood (*Carpinus caroliniana*), hop hornbeam (*Ostrya virginiana*), strawberry bush (*Euonymus americanus*), and St. Andrew's cross (*Hypericum hypericoides* subsp. *hypericoides*). The rocky channel of the creek is occupied by sycamore (*Platanus occidentalis*), swamp dogwood (*Cornus obliqua*), Carolina willow (*Salix caroliniana*), black willow (*S. nigra*), and false indigo (*Amorpha nitens*).

The herbaceous layer is rich and varied depending on the stretch of stream. Important species along the banks include tall coreopsis (*Coreopsis tripteris*), lousewort (*Pedicularis canadensis*), river oats (*Chasmanthium latifolium*), mist flower (*Conoclinium coelestinum*), dwarf dandelion (*Krigia biflora* var. *biflora*), wingstem crownbeard (*Verbesina helianthoides*), frostweed (*V. virginica*), cardinal flower (*Lobelia cardinalis*), downy lobelia (*Lobelia puberula* var. *mineolana*), nodding ladies- tresses (*Spiranthes cernua*), and water horehound (*Lycopus rubellus*). Wooded terraces are occupied by Christmas fern (*Polystichum acrostichoides*), rattlesnake fern (*Botrychium virginianum*), Carolina elephant's foot (*Elephantopus carolinianus*), mayapple (*Podophyllum peltatum*), loosestrife (*Lysimachia lanceolata*), sedges (*Carex blanda* & *C. planispicata*), hairy brome (*Bromus pubescens*), and rosettegrass (*Dichanthelium* spp.). The channel proper is occupied by water willow (*Justicia americana*), purple axil-flower (*Mecardonia acuminata*), hedge-hyssop (*Gratiola virginiana* var. *virginiana*), false nettle (*Boehmeria cylindrica*), and a bulrush (*Scirpus pendulus*).

14) Mesic North Slope Hardwood Forest

This community (Appendix A, Figure 25) occupies an area of 8.1 acres (3.3 ha) in the study area and occurs on north-facing slopes. It is dominated by white oak (*Quercus alba*) and northern red oak (*Quercus rubra*), with mockernut hickory (*Carya tomentosa*), white ash (*Fraxinus americana*), sugar maple (*Acer saccharum* var. *saccharum*), red maple (*Acer rubrum* var. *rubrum*), red mulberry (*Morus rubra*), black cherry (*Prunus serotina*), and basswood (*Tilia americana* var. *americana*) important, at least locally. Bitternut hickory (*Carya cordiformis*) and shellbark hickory (*Carya laciniata*) are restricted to this community in the study area. The understory is diverse and includes flowering dogwood (*Cornus florida*), pawpaw (*Asimina triloba*), bladdernut (*Staphylea trifolia*), musclewood (*Carpinus caroliniana*), hop hornbeam (*Ostrya virginiana*), rusty black haw (*Viburnum rufidulum*), strawberry bush (*Euonymus americanus*), maleberry (*Lyonia ligustrina*), mountain azalea (*Rhododendron prinophyllum*), lowbush blueberry (*Vaccinium pallidum*), derrberry (*Vaccinium stamineum*), and red buckeye (*Aesculus pavia*).

The herbaceous layer is especially rich and includes a large number of species that are restricted to this habitat type within the study area. Common species are blue phlox (*Phlox divaricata* subsp. *laphamii*), Christmas fern (*Polystichum acrostichoides*), northern maidenhair fern (*Adiantum pedatum* var. *pedatum*), white trout lily (*Erythronium albidum*), toothwort (*Cardamine concatenata*), wild geranium (*Geranium maculatum*), and purple trillium (*Trillium recurvatum*). Sessile bellwort (*Uvularia sessilifolia*), Solomon's seal (*Polygonatum biflorum*), black cohosh (*Cimicifuga racemosa*), James' sedge (*Carex jamesii*), a sedge (*Carex rosea*), yellow trout lily (*Erythronium rostratum*), fragile fern (*Cystopteris protrusa*), sweet anise (*Osmorhiza longistylis*), white snakeroot (*Ageratina altissima* var. *altissima*), bluestem goldenrod (*Solidago caesia*), tall bellflower (*Campanulastrum americanum*), starry campion (*Silene stellata*), pinesap (*Monotropa hypopithys*), bloodroot (*Sanguinaria canadensis*), dwarf larkspur (*Delphinium tricornis*), yellow violet (*Viola pubescens*), and Canada white violet

(*Viola canadensis* var. *canadensis*) are among those herbaceous species restricted to this community in the study area.

This community has been impacted by the construction of Greers Ferry Lake. The species composition becomes more rich and mesophytic downslope, and presumably was even more rich and mesophytic on the toe of the slope, which is below the present day lake.

Plant Species of Importance in the Study Area

State Species of Conservation Concern

Six state species of conservation concern were found in the study area during the 2005 field season (Figure 9). Each of these rare species is actively tracked by the Arkansas Natural Heritage Commission (2005). They are (presented with global and state conservation status codes):

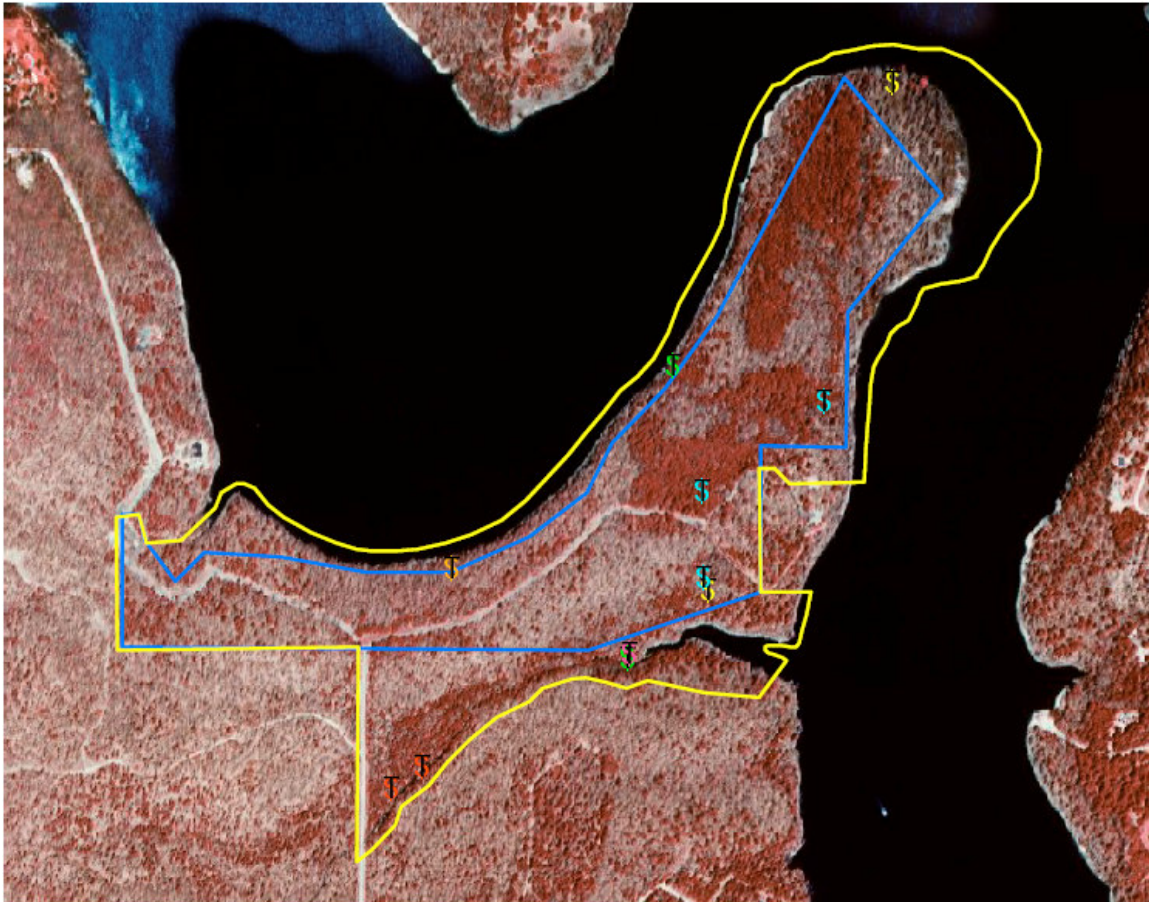


Figure 9. Map showing the location of populations of plant species of conservation concern. Blue \$ = Swan's sedge, Red \$ = Nuttall's pleatleaf, Yellow \$ = false hop sedge, Green \$ = Carolina spring beauty, Pink \$ = rough-seeded fameflower, and Orange \$ = Canada white violet. The dark blue polygon is the existing South Fork Native Plant Preserve boundary. The yellow polygon is the study area boundary.

1. Rough-seeded fameflower (*Phemeranthus rugospermus*) G3G4S1 – This species was first documented in Arkansas in 1999 and was previously known in the state only from high-quality sand barrens (small patches of open, very sandy, desert-like habitat) in the Gulf Coastal Plain of southwestern Arkansas and one novaculite (chert) glade in the Ouachita Mountains. Several plants were found growing in a small sandstone glade in the study area (N 35.55541, W 92.38160) growing with broomsedge bluestem (*Andropogon virginicus*), rushfoil (*Croton wildenowii*), bull greenbrier (*Smilax bonanox*), star moss (*Polytrichum commune*, a moss), rosettegrass (*Dichanthelium* spp.), nits-and-lice (*Hypericum drummondii*), and eastern red cedar (*Juniperus virginiana*). This glade

is situated on the north side of the stream near the southern edge of the Gates Rogers Foundation property, not far above the waterfall. This species is a true desert plant, adapted to handle the hot and dry conditions of the glade. The leaves are succulent and hold water during dry periods. It is often found with other desert species like prickly pear cactus (*Opuntia* spp.), yucca (*Yucca* sp.), and false aloe (*Manfreda virginica*). It differs from other, more common species of fameflower by its wrinkled, or rugose, seeds. Very few individuals were found and evidently only two flowered, so rather than collecting an entire plant for a voucher, only seeds were taken (still adequately documenting the wrinkled seeds, a diagnostic character for identifying this species). Formerly called *Talinum rugospermum*.

2. Canada white violet (*Viola canadensis* var. *canadensis*) G5S2 – This rare violet was found on 11 May 2005 on the north-facing slope above the lake in a small depression associated with a tip-up mound (where a tree fell long ago). Coordinates: N 35.55667, W 92.38476. It is known in Arkansas only from a few sites in the southern Ozarks.

3. False hop sedge (*Carex lupuliformis*) G4S1S2 – This species of sedge, rare in Arkansas, is typically found in low, rich bottomland forests along major rivers in the eastern and southern parts of the state. A single clump of about 20 stems was found growing in the depressional wetland on the GRF land (N 35.55650, W 92.38026). Several smaller clumps were also found in the lowland forest on Corps of Engineers land at the northern tip of the peninsula. Prior to this collection, this species was known in Arkansas only from Clay, Mississippi, Arkansas, Lee, Craighead, and Saline Counties. This occurrence represents the first record from the Interior Highlands and is a significant range extension for the species.

4. Nuttall's pleatleaf (*Nemastylis nuttallii*) G4S2 – This uncommon species in the iris family occurs only in glades and prairies and is limited in distribution to the Interior Highlands (the Ozark and Ouachita Mountains). It is found nowhere else in the world and is known from fewer than 15 sites in Arkansas. There is a population of at least 50 plants in a small, seasonally wet sandstone glade on the north shore of the bedrock bottom stream (N 35.55347, W 92.38587), not far from Bachelor road into the GRF property. A second, smaller population occurs downstream in similar habitat, with at least 11 plants (N 35.55378, W 92.38532). This species is unusual in that it blooms for only a brief period in the evening just before dusk.

5. Carolina spring beauty (*Claytonia caroliniana*) G5S2S3 – This rare species of spring beauty differs from the common spring beauty (*Claytonia virginica*) by having broad leaves that taper abruptly to the petiole (leaf stalk). It is known in Arkansas only from a few counties in the southern Ozarks and is considered to be disjunct from the Appalachians. While *C. virginica* is common on the GRF land and occurs in a variety of habitats, *C. caroliniana* is restricted to two areas on the property, both shaded, seasonally moist areas within sandstone glades and woodlands. One site occurs near a gladey spring run on the west side of the peninsula (N 35.55960, W 92.38079) and the other is a mossy area in a brushy glade along the stream above the waterfall (N 35.55534, W 92.38165).

6. Swan's sedge (*Carex swanii*) G5S3 – This species of sedge is uncommon in Arkansas. It is typically found in low, rich bottomland forests but can be found on the margins of wooded seeps in Arkansas. The depressional wetland on the GRF land supports a large population of this species, with more than 100 clumps (N 35.55650, W 92.38026). It is also found in a small, spring-fed drainage in a gladey area on the east side of the peninsula (N 35.55908, W 92.37811), and is thinly scattered in the lowland forest on the northeast side of the peninsula.

Other Species of Note or Interest

While the following species are not tracked as elements of special concern by State or Federal Conservation Agencies, their occurrence within the study area is notable because they occur as significantly disjunct populations, are edge-of-range occurrences, are restricted to an unusual or uncommon habitat, or are otherwise significant.

Drummond's red maple (*Acer rubrum* var. *drummondii*) – This variety of red maple can be distinguished from the common upland variety by the hairy undersurface of its leaves (Smith 1994). In Arkansas, it is typically found in lowland forests and swamp margins (it is often also called “swamp red maple”) in the Mississippi Alluvial Plain and Gulf Coastal Plain ecoregions (Smith 1988). Records from the Interior Highlands are few and are likely associated with unusual wetlands. It is found in the study area in the upland depression wetland community where it occurs with *Vaccinium fuscatum*, another unusual shrub for the Interior Highlands.

Big carpetgrass (*Axonopus furcatus*)– This species is typically found in the Gulf Coastal Plain in southern Arkansas, where it grows in wet pine flatwoods and open, seasonally wet areas. To our knowledge, this is the first documentation of this native grass from the Interior Highlands (Smith 1988). This species was locally common in the sandy grassland and upper shoreline communities near Greers Ferry Lake in the study area.

Walking fern (*Asplenium rhizophyllum*) – This interesting species of fern can be readily recognized by its unlobed leaves and its “walking” habit, by which it roots at the tips of the leaves and “walks” across the rocks. It is considered a strict calciphile, requiring a rock substrate high in calcium carbonate or similar minerals. It is nearly always found on moss-covered limestone or dolomite rocks in Arkansas, with rare stations on shales with carbonate layers. The location of this species on a north-facing shale outcrop/bluff in the study area is at the southeastern edge of its range in Arkansas (Peck & Taylor 1995). It is also notable for the shale substrate.

A hybrid sedge (*Carex hirsutella* X *Carex swanii*) – Several clumps of this hybrid sedge were found in the pine forest in the study area and were determined by Tyler Smith of the University of Ontario, an expert on *Carex* Sect. *Porocystis*, to which both parent species belong. He came to the site on 29 May 2005 while conducting field work for a taxonomic revision of the Section based on both morphological and molecular research. Recent correspondence with him reveals that the results of molecular genetic analysis

support the preliminary determination (based on morphological characters) that these plants are a hybrid between the two species. Because the hybrid involves a parent species that is of conservation concern, it too may be of conservation concern. It is unknown whether or not a hybrid of these two species has ever been reported in the scientific literature.

Arkansas sneezeweed (*Helenium campestre*) – As recently as 1974, this species was believed to be endemic to Central Arkansas (Arkansas Department of Planning, 1974). Its range is now known to extend into small parts of Missouri, Texas, and Louisiana, where it is tracked as “critically imperiled” (S1) (NatureServe 2006). Nonetheless, Arkansas is clearly the center of this species’ range, where it is considered to be secure.

A bulrush (*Isolepis pseudosetacea*)– This species, listed in Smith (1988) as *Scirpus molestus* M. C. Johnst., is apparently uncommon in Arkansas. It is documented by specimens from wet depressions in sandstone glades in Independence, Izard, Stone, and Logan counties, and from wet depressions in igneous glades in Saline County. Smith (1988) lists it as reported (without a voucher specimen) from Drew County.

Palmer’s saxifrage (*Saxifraga palmeri*) – Though this species is not rare enough to be considered to be of conservation concern in Arkansas, it is one of 36 plant species endemic to the Interior Highlands (Zollner et al. 2005). Known only from Arkansas and Oklahoma, it is typically found in moist spots in glades, or growing along moist bluffs or rock outcrops.

Blue wood aster (*Symphyotrichum sagittifolium*) – This species is part of a complex of difficult to identify taxa that includes several related species of white to blue-flowered asters with long-petioled leaves with cordate bases to the leaf blades. It was lumped with *Symphyotrichum cordifolium* by Smith (1988) and with *Symphyotrichum drummondii* by some other authors, but was recognized as a distinct species by Cronquist (1980). Based on keys and species descriptions in Cronquist (1980), we found material from the north-facing slope represented by Witsell #05-1366 consistent with *S. sagittifolium* and distinct from material of *S. drummondii* also collected from the study area (Baker #GRF-354). As such, we follow Cronquist in recognizing both species from the study area. Cronquist (1980) points out that *S. sagittifolium* is “often in more mesic habitats than *A. drummondii*, with which it hybridizes extensively”. Because the species was lumped with other species by previous Arkansas authorities, it is unclear how widespread or common it truly is in the state. A detailed study of herbarium specimens will be required to sort this out. Witsell has collected it once before, in Saline County in cutover bottomland hardwood forests along the Saline River in the Gulf Coastal Plain. Formerly called *Aster sagittifolius* Willd.

Highbush blueberry (*Vaccinium fuscatum*) – This species of native blueberry is known in Arkansas almost exclusively from the Gulf Coastal Plain, with a few stations in the southern Ouachita Mountains near the boundary with the Gulf Coastal Plain in Garland

and Montgomery Counties, where it is associated with wooded seepage wetlands (Smith 1988; Marsico 2005) and in Saline County (Witsell, pers. obs.). It was also recently found in similar habitat to that within the study area (an upland depression wetland) in Cleburne County at Big Creek Natural Area. Together, these two stations represent the only sites in the Ozarks/Arkansas Valley and represent small populations that are disjunct from the main range of the species. It is interesting to note that upland depression wetlands in the Ozarks and Ouachitas provide habitat to disjunct populations of a number of other species more typical of the Coastal Plain.

Potential State Species of Conservation Concern

The following state species of conservation concern are known from Van Buren County or surrounding counties and could possibly occur in appropriate habitat at the South Fork Native Plant Preserve. While the current inventory was very thorough, it is possible, though not likely, that one or more of the following species were overlooked. It is also possible that one or more of the following species will occur in the study area as ecological restoration progresses. It may also be desirable to intentionally introduce one or more of these species to the South Fork Native Plant Preserve, especially if local seed is collected and the introduction is properly documented (so as not to confuse future researchers).

Short's rockcress (*Arabis shortii* var. *shortii*) G5T5S1 – This species is known from a wooded, south-facing hillside above the Middle Fork of the Little Red River near Shirley.

Great Indian plantain (*Arnoglossum muehlenbergii*) G4S2 – This species is known from Deadland Hollow, in rich, mesic floodplain woods and north slopes along the Middle Fork of the Little Red River.

Lobed spleenwort (*Asplenium pinnatifidum*) G4S3 - This species of fern grows from cracks and pits in dry bluffs. It is known from a south-facing sandstone bluff southeast of the study area in Van Buren County and from a nearby site in similar habitat in Cleburne County.

Capillary hairsedge (*Bulbostylis capillaris*) G5S3 – In Arkansas this species is restricted to sandstone and shale glades in the Interior Highlands and deep sand barrens in the Gulf Coastal Plain. It occurs in several sandstone glades in the Fairfield Bay community in Van Buren County. It could occur in sandstone glades in the study area as restoration progresses.

Bush's poppy-mallow (*Callirhoe bushii*) G3S3 – This species is known from open woods, roadsides, and glade margins. It is known from several sites in Van Buren County.

A sedge (*Carex careyana*) G5S3 – This species of rich, mesic valleys is known from Van Buren County.

A sedge (*Carex normalis*) G5S1 - This species is known from Deadland Hollow, in rich, mesic floodplain woods and north slopes along the Middle Fork of the Little Red River.

A sedge (*Carex sparganioides*) G5S3 – This species is known from Deadland Hollow, in rich, mesic floodplain woods and north slopes along the Middle Fork of the Little Red River.

Ozark chinquapin (*Castanea pumila* var. *ozarkensis*) G5T3S3S4 – This species is known from a great many sites throughout the Ozarks, but has declined (and is

continuing to decline) due to infection by the chestnut blight. It occurs only in the Interior Highlands and was not an uncommon tree prior to the arrival of the blight. Occasional small stump sprouts are still found and fruiting specimens are tracked as an element of special concern by the Arkansas Natural Heritage Commission. The nearest documented site is from rocky woods at the base of a bluff near Shirley.

Blue cohosh (*Caulophyllum thalictroides*) G4G5S2 - This species is known from Deadland Hollow, in mesic floodplain woods and north slopes along the Middle Fork of the Little Red River.

Washington hawthorn (*Crataegus phaenopyrum*) G4?SH – This species was collected by Mary Alice Beer from Van Buren County.

Hazel dodder (*Cuscuta corylii*) G5SU – This parasitic plant, which lacks chlorophyll, was collected by Mary Alice Beer from Fairfield Bay in Van Buren County.

Moore's larkspur (*Delphinium newtonianum*) G3S3 – This species is endemic to the Ozark and Ouachita Mountains of Arkansas. There are a number of sites 25 to 40 miles west of the study area in mesic floodplain woods and north slopes in the Ozark National Forest.

Crinkled hairgrass (*Deschampsia flexuosa*) G5S2S3 – This species is known from margins of blufftop glades and in adjacent woodlands over sandstone substrate at Big Creek Natural Area in Cleburne County. It could occur in restored woodlands in the study area.

Openground whitlowgrass (*Draba aprica*) G3S2 – This globally rare mustard is known from glade margins and rocky woodlands on a variety of substrates in Arkansas. It could occur in sandstone glades in the study area. There are several sites within 35 miles of the study area.

Leed's wood fern (*Dryopteris Xleedsii*) HYBS1 – This large and showy fern is exceedingly rare. It is the naturally occurring hybrid between *D. celsa* and *D. marginalis* (Peck & Taylor, 1995). Until it was found in Stone County in 1999, it was known in Arkansas only from a single plant on a north facing talus slope above the Little Red River near Shirley (Peck, Witsell, & Hendrix, 2000). This plant has been persisting at this site since at least the 1930s. A nurseryman in Florida has recently propagated this fern from the Shirley plant using tissue culture techniques. It might be a species to include in plantings at the South Fork Native Plant Preserve.

Three-way sedge (*Dulichium arundinaceum*) G5S3 – This relatively easy to identify sedge occurs in a variety of open wetland types in Arkansas, including seepage wetlands and wet areas along streambanks. It is known from wet banks of Big Creek at Big Creek Natural Area in Cleburne County.

Soapwort gentian (*Gentiana saponaria*) G5S3 – This species grows in seepage areas and along streams. It is known from Cleburne County and has been reported from a seepage area near Clinton in Van Buren County.

Arkansas alumroot (*Heuchera villosa* var. *arkansana*) G5T3QS3 – The attractive fall-blooming alumroot is endemic to the Arkansas portions of the Ozark and Ouachita Mountains. It typically occurs on moist, acidic (usually sandstone) bluffs. A large population occurs on a moist, north-facing sandstone bluff along Sandiff Road along the Middle Fork of the Little Red River near Fairfield Bay.

Small-headed pipewort (*Eriocaulon kornickianum*) G2S2 – This globally rare species is restricted to seepage areas and wet depressions within glades. It was found in this habitat type in a sandstone glade at Fairfield Bay by Mary Alice Beer in Van Buren County. Appropriate habitat for this species occurs along the bedrock-bottom stream within the study area but south of the Gates Rogers Foundation property.

Corkwood (*Leitneria floridana*) G3S3 – This globally rare shrub is typically found in bottomland hardwood forests and swamp margins in the Mississippi Alluvial Plain and Gulf Coastal Plain. A single population is known from the Interior Highlands, from an upland depression wetland (similar to the one at the South Fork Native Plants Preserve) near the Greers Ferry dam site.

Yellow monkey flower (*Mimulus floribundus*) G5S2S3 – This species is known from north-facing sandstone bluffs along Big Creek at Big Creek Natural Area in Cleburne County.

Alabama snow-wreath (*Neviusia alabamensis*) G2S1S2 – This showy shrub in the rose family is known from bluffs in Faulkner and Pope Counties. It is globally rare and is not known to sexually reproduce. It is available in the nursery trade and may be one to consider for educational gardens at the South Fork Native Plants Preserve.

Hairy mock orange (*Philadelphus hirsutus*) G5S2S3 – This shrub of bluffs is known from several sites in the region, including one within 15 miles of the study area. A mock orange was found in the study area, but it evidently did not flower in 2005. Careful comparison of these plants to herbarium specimens at the University of Central Arkansas Herbarium lead us to believe that they are likely *Philadelphus pubescens*.

Woodland stonecrop (*Sedum ternatum*) G5S3 – This species is known from moist woods and rocky streambanks along Big Creek at Big Creek Natural Area in Cleburne County.

Ovate-leaf catchfly (*Silene ovata*) G2G3S3 – This species is known from several north-facing sandstone bluffs and steep rocky slopes in the region. It has been reported from Big Creek Natural Area in Cleburne County.

White-flowered goldenrod (*Solidago ptarmicoides*) G5S1S2 – This species is very rare in Arkansas, and is presently known to occur at just 4 sites in the state (one site in Cleburne County, one in Baxter County, and two in Benton County). It was discovered at the edge of a pasture in Van Buren County by Mary Alice Beer in 1990 but has not been seen at the site in recent years, despite periodic surveys. It could occur at the South Fork Native Plants Preserve as restoration progresses.

Silky aster (*Symphyotrichum sericeum*) G5S2 – This species occurs at scattered glade and prairie sites in the Ozark Mountains. The southern-most site known is in Fairfield Bay, Van Buren County, in the vicinity of Greers Ferry Lake. It could occur in sandstone glades at the South Fork Native Plants Preserve as restoration progresses. Formerly called *Aster sericeus*.

Bristle fern (*Trichomanes boschianum*) G4S2S3 – This species is very rare in Arkansas, where it is known only from the Ozark Mountains and is typically found growing in near darkness on wet walls at the back of overhanging bluff shelters, often behind waterfalls. It is known from the dripping back wall of an overhanging sandstone bluff shelter in Wackley Hollow, just upstream from a cove of Greers Ferry Lake. This site is very similar to the overhang just below the waterfall at the southeast corner of the study area. This species was searched for several times at this site in 2005, and it does not occur there, though it might be possible to introduce it to the site.

Ozark cornsalad (*Valerianella ozarkana*) G3S3 – This species is endemic to the Interior Highlands and is typically found in glades and open woodlands in the Ozark Mountains of Arkansas and Missouri.

Exotic Invasive Species

Of the 55 introduced taxa found in the study area, 16 are considered to be invasive or potentially invasive in communities occurring in the study area. These taxa either currently present a threat to one or more communities in the study area, or could present a threat at some point in the future. At present, however, none of these taxa occur at levels that are significantly altering plant communities in the study area. Nonetheless, control efforts should begin for higher priority species before they become a serious problem. This will save time and money in the future and help insure the success of restoration activities.

The following invasive species were found in the study area:

- 1) Nodding thistle, musk thistle (*Carduus nutans*) – CC, RD
- 2) Queen Anne's lace (*Daucus carota*) – RD
- 3) Air potato (*Dioscorea polystachya*) - RI
- 4) Ox-eye daisy (*Leucanthemum vulgare*) – RD, SSB
- 5) Japanese honeysuckle (*Lonicera japonica*) – LF, NS, PHF, RD, SSB
- 6) Bicolor lespedeza (*Lespedeza bicolor*) - RD
- 7) Sericea lespedeza (*Lespedeza cuneata*) – LF, RD, RI, SG, SL
- 8) Beefsteak plant (*Perilla frutescens*) – RD, RI, SL, LF
- 9) Chinaberry (*Melia azedarach*) – RD, CC
- 10) Chinese privet (*Ligustrum sinense*) – LF, RI, RD
- 11) Meadow brome (*Bromus commutatus*) - RD
- 12) Soft chess (*Bromus hordeaceus* ssp. *hordeaceus*) - RD
- 13) Bald brome (*Bromus racemosus*) - RD
- 14) Orchard grass (*Dactylis glomerata*) – CC, RD
- 15) Tall fescue (*Schedonorus arundinaceus*) – RD, RI, SG
- 16) Tree-of-heaven (*Ailanthus altissima*) – RD, CC

Comments on eastern red cedar

In addition to these 16 exotic invasive species, the native eastern red cedar (*Juniperus virginiana* var. *virginiana*) presents a threat to species in glades and open woodlands in the study area. While eastern red cedar is a natural component of these communities, the absence of fire from the study area over the last several decades has led to an increase of this species and a closing in of these communities with eastern red cedar. Because cedar densities have reached a level in these communities that has altered the fuel types on the ground (from grasses and forbs to cedar duff), fire alone will likely not be sufficient to restore the communities. Mechanical removal of the majority of these cedars, followed by prescribed fire, will be an expedient and effective restoration technique. Because eastern red cedar is a naturally occurring component of these ecosystems, we suggest leaving a few of the largest individuals along blufflines and in other fire-protected sites within the glades.

ANNOTATED CHECKLIST

The following is a list of all vascular plant taxa documented within the study area of the South Fork Native Plant Preserve and surrounding lands. Taxa are arranged alphabetically by family within the four major groups of Pteridophytes, Gymnosperms, Angiosperms (Dicots), and Angiosperms (Monocots). Nomenclature follows the Draft *Checklist of the Vascular Flora of Arkansas* (Arkansas Vascular Flora Committee 2006). Introduced taxa are indicated by an asterisk (*). Taxa tracked by the Arkansas Natural Heritage Commission as species of conservation concern are listed in **bold** type. Codes for the habitats in which taxa were found are listed and correspond to habitats as follows:

CC	= clearcut
DW	= upland depression wetland
LF	= lowland forest
NS	= mesic north slope hardwood forest
PF	= shortleaf pine forest
PHF	= pine-hardwood forest (upland)
PSG	= perennial shoreline grassland
RD	= roadsides
RI	= riparian forest along creek
SG	= sandstone glade and associated open woodland
SHB	= shale bluffs (calcareous)
SL	= shoreline area of Greers Ferry lake
SP	= springs and spring runs
SSB	= sandstone bluffs

Those taxa with a slash (/) between two codes reflect occurrence in the transition zone between the two habitats. Following the habitat codes is a number which corresponds to the relative frequency of the taxon within the entire study area, classified as follows:

5	= abundant
4	= common
3	= occasional
2	= infrequent
1	= rare

In many cases, more than one specimen of a taxon was collected by an author or both authors, with each being given separate collection numbers. Only one voucher number is listed for each taxon except where both authors collected specimens of the same taxa, in which case, one collection number is listed for each author. For taxa that were observed but not collected, the words “not collected” are listed in parenthesis. Voucher specimens are deposited in the Herbarium of the South Fork Native Plant Preserve, owned and managed by the Gates Rogers Foundation, Inc.

PTERIDOPHYTES

ASPLENIACEAE

Asplenium platyneuron (L.) Britton, Stearns, & Poggenb.; ebony spleenwort; DW, NS, PF, RD, SG, SSB; 5 (Baker GRF-175)

Asplenium rhizophyllum L.; walking fern; SHB/NS; 1 (Witsell 05-27, Baker GRF-007)

Asplenium trichomanes L. subsp. *trichomanes*; maidenhair spleenwort; SSB; 1 (Witsell 05-248)

DENNSTAEDTIACEAE

Pteridium aquilinum (L.) Kuhn in Decken; bracken fern; PHF, RD; 2 (Baker GRF-232)

DRYOPTERIDACEAE

Cystopteris protrusa (Weath.) Blasdell; fragile fern; NS; 1 (Baker GRF-176)

Polystichum acrostichoides (Michx.) Schott; Christmas fern; NS, PHF, RI; 4 (Baker GRF-144)

Woodsia obtusa (Spreng.) Torr.; blunt-lobed cliff fern; NS, RD, SG, SSB; 3 (Baker GRF-177)

ISOETACEAE

Isoetes melanopoda Gay & Durieu; quillwort; RI, SP; 1 (Witsell 05-85)

OPHIOGLOSSACEAE

Botrychium biternatum (Savigny) Underw.; winter grape fern; LF; 3 (Witsell 05-1312)

Botrychium dissectum Spreng. f. *obliquum* (Muhl.) Fernald; cutleaf grape fern; LF; 3 (Baker GRF-339)

Botrychium virginianum (L.) Sw.; rattlesnake fern; NS, PHF, RI; 3 (Baker GRF-045)

Ophioglossum pycnostichum (Fernald) Á. Löve & D. Löve; adder's tongue fern; SG/SP; 1 (Witsell 05-244)

POLYPODIACEAE

Pleopeltis polypodioides (L.) E. G. Andrews & Windham in Windham var. *michauxiana* (Weath.) E. G. Andrews & Windham in Windham; resurrection fern; NS, SSB; 3 (Witsell 05-28)

PTERIDACEAE

Adiantum pedatum L. var. *pedatum*; northern maidenhair fern; NS; 2 (Baker GRF-167)

Cheilanthes lanosa (Michx.) D. C. Eaton in Emory; hairy lipfern; SG; 2 (Baker GRF-019)

SELAGINELLACEAE

Selaginella eclipses W. R. Buck; spikemoss; SP; 1 (Witsell 05-270, Baker GRF-148)

GYMNOSPERMS

CUPRESSACEAE

Juniperus virginiana L. var. *virginiana*; eastern red cedar; NS, PF, PHF, RD, RI, SG, SSB; 5 (Baker GRF-153)

PINACEAE

Pinus echinata Mill.; shortleaf pine; CC, PF, PHF, RD, RI, SG, SSB; 5 (Witsell 05-791)

ANGIOSPERMS (DICOTS)

ACANTHACEAE

Justicia americana (L.) Vahl; water willow; RI, SL; 3 (Witsell 05-528)

Ruellia humilis Nutt. var. *humilis*; hairy wild petunia; RD, SG/RI; 2 (Baker GRF-248)

Ruellia pedunculata Torr. ex A. Gray subsp. *pedunculata*; wild petunia; PHF, SG; 3 (Baker GRF-111)

ACERACEAE

Acer negundo L.; boxelder; LF, RD; 2 (Witsell 05-534)

Acer rubrum L. var. *drummondii* (Hook. & Arn. ex Nutt.) Sarg.; Drummond's red maple; DW; 1 (Baker GRF-068)

Acer rubrum L. var. *rubrum*; red maple; CC, LF, NS, PF, PHF, RD, RI, SSB; 4 (Baker GRF-234)

Acer saccharinum L.; silver maple; SL; 2 (Baker GRF-160)

Acer saccharum Marshall var. *saccharum*; sugar maple; NS; 3 (Baker GRF-161)

ALTINGIACEAE

Liquidambar styraciflua L.; sweetgum; DW, LF, NS, PF, PHF, PSG, RD, RI, SL; 4 (Witsell 05-747)

ANACARDIACEAE

Rhus aromatica Aiton var. *aromatica*; fragrant sumac; PHF, SG, SSB; 4 (Witsell 05-24, Baker GRF-004)

Rhus copallina L.; winged sumac; CC, RD, SG; 3 (Baker GRF-235)

Rhus glabra L.; smooth sumac; RD; 3 (Witsell 05-636)

Toxicodendron radicans (L.) Kuntze; poison ivy; CC, LF, NS, PF, PHF, RD, RI, SSB; 5
(Baker GRF-076)

ANNONACEAE

Asimina triloba (L.) Dunal; pawpaw; NS; 2 (Baker GRF-086)

APIACEAE

Ammoselinum butleri (Engelm. ex S. Watson) J. M. Coult. & Rose; Butler's sand parsley;
RD; 1 (Witsell 05-223)

Chaerophyllum tainturieri Hook. var. *tainturieri*; wild chervil; RD; 3 (Baker GRF-037)

**Daucus carota* L.; Queen Anne's lace; RD; 1 (Baker GRF-224)

Daucus pusillus Michx.; rattlesnake weed; RD; 2 (Baker GRF-115)

Eryngium prostratum Nutt. ex DC.; creeping eryngo; LF, PSG, SL; 4 (Witsell 05-749,
Baker GRF-186)

Osmorhiza longistylis (Torr.) DC.; sweet anise; NS; 1 (not collected)

Ptilimnium nuttallii (DC.) Britton; mock bishop weed; RD, SG; 4 (Witsell 05-630, Baker
GRF-198)

Sanicula canadensis L.; black snakeroot; NS, PHF, RI; 3 (Baker GRF-170)

Spermolepis divaricata (Walter) Raf. ex Ser.; scaleseed; RD; 1 (Witsell 05-523, Baker
GRF-211)

Thaspium trifoliatum (L.) A. Gray var. *flavum* Blake; meadow parsnip; RI, SSB/NS; 2
(Witsell 05-386, Baker GRF-083)

Trepocarpus aethusae Nutt.; white nymph; LF, RD, SG, SSB; 3 (Baker GRF-182)

Zizia aurea (L.) W. D. J. Koch; golden Alexanders; PHF, SG; 1 (not collected)

APOCYNACEAE

Amsonia tabernaemontana Walter; bluestar; NS, SG/SP; 1 (Baker GRF-046)

Apocynum cannabinum L.; Indian hemp; RD; 1 (Baker GRF-098)

Trachelospermum difforme (Walter) A. Gray; climbing dogbane; LF, PSG, RI, SL; 4
(Baker GRF-187)

AQUIFOLIACEAE

Ilex decidua Walter var. *decidua*; deciduous holly; DW, LF, RI; 4 (Witsell 05-267, Baker
GRF-222)

ARALIACEAE

Aralia spinosa L.; devil's walkingstick; NS, RD; 2 (Witsell 05-1304)

ARISTOLOCHIACEAE

Aristolochia serpentaria L.; Virginia snakeroot; NS, PHF; 3 (Witsell 05-254, Baker GRF-074)

ASCLEPIADACEAE

Asclepias quadrifolia Jacq.; four-leaved milkweed; CC, NS, PHF; 2 (Witsell 05-275)

Asclepia tuberosa L. subsp. *interior* Woodson; butterfly milkweed; RD; 1 (not collected)

Asclepias variegata L.; white milkweed; PF, PHF, RD; 2 (Witsell 05-539, Baker GRF-137)

Matelea decipiens (Alexander) Woodson; climbing milkweed; LF, PHF, RI, SG; 3 (Baker GRF-185)

ASTERACEAE

Achillea millefolium L.; yarrow; RD; 1 (Baker GRF-097)

Ageratina altissima (L.) R. M. King & H. Rob. var. *altissima*; white snakeroot; NS; 2 (Witsell 05-1367, Baker-331)

Ambrosia artemisiifolia L.; common ragweed; RD, SL; 4 (Witsell 05-1190)

Ambrosia bidentata Michx.; lanceleaf ragweed; RD, SG, SL, SSB; 4 (Witsell 05-1294)

Antennaria parlinii Fernald subsp. *fallax* (Greene) R. J. Bayer & Stebbins; pussy's toes; PHF, RI, SG; 4 (Witsell 05-244, Baker-009)

Bidens aristosa (Michx.) Britton; tickseed sunflower; LF, RD, SL; 3 (Baker GRF-328)

Bidens frondosa L. var. *frondosa*; beggar ticks; RI, SL; 2 (Witsell 05-1332)

Boltonia diffusa Elliott; doll's daisy; LF, PSG, RI, SG, SL, SSB; 3 (Witsell 05-1199)

Bradburiya pilosa (Nutt.) Semple; golden aster; RD; 2 (Baker GRF-290)

Brickellia eupatorioides (L.) Shinnars var. *texana* (Shinnars) Shinnars; false boneset; RD; 1 (Witsell 05-1167)

**Carduus nutans* L.; nodding thistle; CC, RD; 2 (Baker GRF-163)

Cirsium altissimum (L.) Hill; tall thistle; CC, RI; 2 (Baker GRF-321)

Conoclinium coelestinum (L.) DC.; mist flower; RI; 1 (not collected)

**Conyza canadensis* (L.) Cronquist; horseweed; CC, RD; 3 (Baker GRF-285)

Coreopsis grandiflora Hogg ex Sweet; tickseed; RD, SG, SSB; 3 (Witsell 05-519, Baker GRF-095)

Coreopsis tripteris L.; tall tickseed; RI; 2 (Baker GRF-253)

Echinacea purpurea (L.) Moench; purple coneflower; RD; 1 (Baker GRF-209)

Eclipta prostrata (L.) L.; false daisy; RI, SL; 4 (Witsell 05-1187)

Elephantopus carolinianus Raeusch.; Carolina elephant's foot; LF, PF, RI; 3 (Witsell 05-1162)

Elephantopus tomentosus L.; elephant's foot; LF, PHF, RD; 2 (Baker GRF-293)

Erechtites hieraciifolius (L.) Raf. ex DC. var. *hieraciifolius*; fireweed; CC, RD, SL; 3 (Witsell 05-1193)

Erigeron pulchellus Michx. var. *pulchellus*; Robin's plantain; PHF; 1 (not collected)

Erigeron strigosus Muhl. ex Willd.; daisy fleabane; RD; 3 (Witsell 05-507, Baker GRF-112)

Eupatorium serotinum Michx.; late boneset; CC, RD, RI, SL; 3 (Witsell 05-1168, Baker GRF-351)

Eurybia hemispherica (Alexander) G. L. Nesom; southern prairie aster; SG/RI; 1 (Baker GRF-319)
 **Facelis retusa* (Lam.) Sch. Bip.; annual trampweed; CC, RD; 2 (Witsell 05-269)
 **Gamochaeta purpurea* (L.) Cabrera; purple cudweed; RD; 3 (Baker GRF-032)
Helenium amarum (Raf.) H. Rock var. *amarum*; bitterweed; RD; 2 (Baker GRF-099)
Helenium campestre Small; sneezeweed; RD, SG; 3 (Witsell 05-524, Baker GRF-139)
Helenium flexuosum Raf.; sneezeweed; LF, PSG; 4 (Baker GRF-219)
Helianthus divaricatus L.; woodland sunflower; PHF, SG, SSB; 3 (Baker GRF-229)
Hieracium gronovii L.; hawkweed; PHF, RD, SG; 3 (Witsell 05-1328, Baker GRF-353)
Krigia biflora (Walter) S. F. Blake var. *biflora*; dwarf dandelion; NS, RI; 2 (Witsell 05-240)
Krigia cespitosa (Raf.) K. L. Chambers var. *cespitosa*; dwarf dandelion; RD; 3 (Baker GRF-042)
Krigia dandelion (L.) Nutt.; potato dwarf dandelion; DW, PHF, RD; 3 (Witsell 05-280)
Krigia virginica (L.) Willd.; Virginia dwarf dandelion; RD; 3 (Baker GRF-043)
Lactuca sp.; wild lettuce; RI; 1 (not collected)
 **Leucanthemum vulgare* Lam.; ox-eye daisy; RD, SSB; 1 (Baker GRF-093)
Liatris squarrulosa Michx.; gayfeather; CC, PHF, RD; 1 (Witsell 05-1172)
Packera obovata (Muhl. ex Willd.) W. A. Weber & Á. Löve; ragwort; DW, PHF, RI, SG, SP; 4 (Baker GRF-050, Witsell 05-259)
Packera tomentosa (Michx.) C. Jeffrey; woolly ragwort; SG/RI, SG/SP; 1 (Witsell 05-96)
Parthenium integrifolium L.; wild quinine; CC, PHF, RD; 2 (Witsell 05-1293)
Pluchea camphorata (L.) DC.; camphor stinkweed; LF, PSG, SL; 3 (Baker GRF-308)
Prenanthes altissima L.; rattlesnake root; NS, RI; 2 (not collected)
Pseudognaphalium obtusifolium (L.) Hilliard & B. L. Burtt subsp. *obtusifolium*; sweet everlasting; CC, RD, SG; 3 (Baker GRF-294)
Rudbeckia hirta L. var. *pulcherrima* Farw.; black-eyed Susan; CC, RD, SSB; 3 (Baker GRF-199)
Solidago buckleyi Torr. & A. Gray; Buckley's goldenrod; SSB/PHF; 1 (Witsell 05-1176)
Solidago caesia L.; bluestem goldenrod; NS; 3 (Baker GRF-329)
Solidago flexicaulis L. vel. aff.; broadleaf goldenrod; NS, SG/PHF; 1 (Witsell 05-1175)
Solidago hispida Muhl. ex Willd.; hairy goldenrod; NS/RI; 1 (not collected)
Solidago nemoralis Aiton; oldfield goldenrod; CC, PHF, RD, SG; 4 (Witsell 05-1311, Baker GRF-352)
Solidago odora Aiton subsp. *odora*; fragrant goldenrod; CC, PHF; 2 (Witsell 05-1161)
Solidago sp.; goldenrod; SSB/PHF; 1 (Baker GRF-307)
Solidago ulmifolia Muhl. ex Willd. var. *palmeri* Cronquist; elmleaf goldenrod; PHF, SSB; 3 (Baker GRF-313)
 **Sonchus asper* (L.) Hill; spiny sowthistle; CC, RD; 2 (Baker GRF-162)
Symphotrichum anomalum (Engelm.) G. L. Nesom; aster; PHF, SSB; 3 (Baker GRF-333)
Symphotrichum drummondii (Lindl. in Hook.) G. L. Nesom; blue wood aster; RD; 2 (Baker GRF-354)
Symphotrichum dumosum (L.) G. L. Nesom; aster; LF, RI; 3 Baker GRF-338)
Symphotrichum lateriflorum (L.) Á. Löve & D. Löve; calico aster; NS, RD; 3 (Witsell 05-1308, Baker GRF-355)

Symphyotrichum patens (Aiton) G. L. Nesom var. *patentissimum* (Lindl. ex DC.) G. L. Nesom; late fall aster; PHF, RD, SG, SSB; 4 (Baker GRF-330)
Symphyotrichum pilosum (Willd.) G. L. Nesom; white heath aster; RD; 2 (Witsell 05-1330)
Symphyotrichum sagittifolium (Wedemeyer) G. L. Nesom vel. aff.; blue wood aster; NS; 1 (Witsell 05-1366)
Symphyotrichum turbinellum (Lindl.) G. L. Nesom; aster; PHF/CC; 1 (Witsell 05-1307)
**Taraxacum officinale* Weber ex F. H. Wigg.; common dandelion; RD; 3 (Baker GRF-041)
Verbesina helianthoides Michx.; wingstem crownbeard; RI; 2 (Witsell 05-517)
Verbesina virginica L.; frostweed; DW, RD, RI, SG/RI; 3 (Witsell 05-1166)
Vernonia baldwinii Torr.; Baldwin's ironweed; RD, SG; 2 (Baker GRF-246)
Vernonia missurica Raf.; Missouri ironweed; RD, RI/SG; 2 (Baker GRF-318)
Xanthium strumarium L.; cocklebur; SL; 4 (Witsell 05-1191)

BALSAMINACEAE

Impatiens capensis Meerb.; jewelweed; LF; 1 (not collected)

BERBERIDACEAE

Podophyllum peltatum L.; mayapple; NS, PHF, RI, SP/SG; 3 (Baker GRF-058)

BETULACEAE

Betula nigra L.; river birch; LF, SL; 2 (Witsell 05-752)
Carpinus caroliniana Walter; musclewood; NS, PHF, RI, SSB; 4 (Witsell 05-276, Baker GRF-065)
Ostrya virginiana (Mill.) K. Koch; hop hornbeam; LF, NS, PHF, RI; 4 (Witsell 05-676)

BIGNONIACEAE

Bignonia capreolata L.; cross vine; NS, PHF, RI; 2 (Witsell 05-382)
Campsis radicans (L.) Seem.; trumpet creeper; LF, RD, RI; 3 (not collected)

BORAGINACEAE

Cynoglossum virginianum L.; wild comfrey; NS, PHF, RI; 3 (Baker GRF-053)
**Heliotropium indicum* L.; Indian heliotrope; SL; 3 (Baker GRF-272)
Myosotis macrosperma Engelm.; forget-me-not; RD, SG; 3 (Baker GRF-055)

BRASSICACEAE

Boechera canadensis (L.) Al-Shehbaz; Canada rockcress; PHR, SG; 2 (Baker GRF-073)
Boechera laevigata (Muhl. ex Willd.) Al-Shehbaz; smooth rockcress; SG; 1 (Witsell 05-109)

Cardamine concatenata (Michx.) O. Schwarz; toothwort; NS, PHF, RI, SG, SP; 4 (Baker GRF-003)

**Cardamine hirsuta* L.; hairy bittercress; RD, RI; 4 (Baker GRF-001)

Cardamine parviflora L. var. *arenicola* (Britton) O. E. Schultz; bittercress; SG; 1 (Witsell 05-20)

Cardamine pensylvanica Muhl. ex Willd.; Pennsylvania bittercress; SP; 1 (Baker GRF-015)

Draba brachycarpa Nutt. ex Torr. & A. Gray; draba; RD, SG; 3 (Witsell 05-29, Baker GRF-010)

Lepidium virginicum L. var. *virginicum*; Virginia pepperweed; RD, SG; 3 (Baker GRF-108)

BUDDLEJACEAE

Polypremum procumbens L.; juniperweed; PSG, SL; 3 (Baker GRF-218)

CACTACEAE

Opuntia humifusa (Raf.) Raf. var. *humifusa*; eastern prickly pear; SG; 1 (Witsell 05-1391)

CALLITRICHACEAE

Callitriche heterophylla Pursh subsp. *heterophylla*; water starwort; SP; 1 (Witsell 05-258)

CAMPANULACEAE

Campanulastrum americanum (L.) Small; tall bellflower; NS; 1 (Baker GRF-281)

Lobelia cardinalis L.; cardinal flower; RI; 2 (Baker GRF-317)

Lobelia inflata L.; Indian tobacco; LF; 1 (Witsell 05-736)

Lobelia puberula Michx. var. *mineolana* E. Wimm.; downy lobelia; RI; 2 (Witsell 05-1194)

Lobelia spicata Lam.; spike lobelia; NS, PHF, RD, SP; 3 (Witsell 05-626, Baker GRF-233)

Triodanis perfoliata (L.) Nieuwl. var. *biflora* (Ruiz & Pav.) T. R. Bradley; Venus' looking glass; RD; 2 (Baker GRF-100)

Triodanis perfoliata (L.) Nieuwl. var. *perfoliata*; Venus' looking glass; RD; 2 (Baker GRF-081)

CAPRIFOLIACEAE

Lonicera flava Sims.; yellow honeysuckle; NS, SSB; 2 (Baker GRF-159)

**Lonicera japonica* Thunb.; Japanese honeysuckle; LF, NS, PHF, RD, SSB; 3 (Baker GRF-135)

Sambucus nigra L. subsp. *canadensis* (L.) Bolli; elderberry; NS; 1 (not collected)

Symphoricarpos orbiculatus Moench; coralberry; NS, PHF, SG; 2 (not collected)
Viburnum rufidulum Raf.; rusty black haw; NS; 2 (Baker GRF-228)

CARYOPHYLLACEAE

**Cerastium brachypetalum* Pers.; mouse-ear chickweed; RD, SG; 2 (Witsell 05-88)
Cerastium brachypodum (Engelm. ex A. Gray) B. L. Rob.; mouse-ear chickweed; RD, SG; 3 (Baker GRF-025)
**Cerastium glomeratum* Thuill.; sticky chickweed; RD; 3 (Baker GRF-029)
**Cerastium pumilum* Curtis; chickweed; RD; 3 (Baker GRF-013)
**Dianthus armeria* L. subsp. *armeria*; Deptford pink; RD; 2 (Baker GRF-110)
Paronychia fastigiata (Raf.) Fernald; nailwort; SSB; 1 (Witsell 05-1185, Baker GRF-273)
Sagina decumbens (Elliott) Torr. & A. Gray subsp. *decumbens*; pearlwort; RD; 2 (Baker GRF-024)
Silene stellata (L.) W. T. Aiton in W. Aiton & W. T. Aiton; starry campion; NS; 2 (Baker GRF-280)
Silene virginica L.; fire pink; PHF, RI, SG, SSB; 2 (Baker GRF-059)
**Stellaria media* (L.) Vill.; common chickweed; NS, PHF, RD, RI, SP, SSB; 3 (Witsell 05-110)

CELASTRACEAE

Euonymus americanus L.; strawberry bush; NS, RI, SSB; 2 (Baker GRF-196)

CELTIDACEAE

Celtis tenuifolia Nutt.; dwarf hackberry; LF, SG; 3 (Witsell 05-230, Baker GRF-060)

CISTACEAE

Lechea tenuifolia Michx.; pinweed; PHF, RD, SG; 2 (Witsell 05-1204)

CLUSIACEAE

Hypericum drummondii (Grev. & Hook.) Torr. & A. Gray; nits-and-lice; PSG, SG; 2 (Witsell 05-808)
Hypericum gentianoides (L.) Britton, Stearns, & Poggenb.; pine-weed; PSG, SG; 2 (Witsell 05-809)
Hypericum hypericoides (L.) Crantz subsp. *hypericoides*; St. Andrew's cross; RI; 3 (Witsell 05-811, Baker GRF-279)
Hypericum hypericoides (L.) Crantz subsp. *multicaule* (Michx. ex Willd.) N. Robson; St. Andrew's cross; PHR, RD; 2 (Baker GRF-286)
Hypericum mutilum L.; dwarf St. John's wort; PSG, RI, SL, SP; 3 (Baker GRF-249)
Hypericum prolificum L.; shrubby St. John's wort; RD, RI, SG, SP, SSB; 4 (Baker GRF-238)

Hypericum pseudomaculatum Bush in Britton; false spotted St. John's wort; LF, RD, SG, SP, SSB; 3 (Baker GRF-181)

Hypericum punctatum Lam.; spotted St. John's wort; RD; 2 (Baker GRF-237)

Triadenum tubulosum (Walter) Gleason; lesser marsh St. John's wort; LF, SL; 2 (Witsell 05-1319)

Triadenum walteri (J. F. Gmel.) Gleason; marsh St. John's wort; LF, PSG, RI; 3 (Witsell 05-1317, Baker GRF-314)

CONVOLVULACEAE

Ipomoea pandurata (L.) G. F. W. Mey.; wild potato vine; RD, RI; 2 (Baker GRF-284)

Ipomoea lacunosa L.; whitestar morning glory; RI, SL; 3 (Witsell 05-1188, Baker GRF-326)

CORNACEAE

Cornus florida L.; flowering dogwood; NS, PHF, RD; 3 (Witsell 05-105)

Cornus obliqua Raf.; swamp dogwood; RI; 3 (Witsell 05-533, Baker GRF-201)

CUSCUTACEAE

Cuscuta compacta Juss. ex Choisy; dodder; LF, SL; 2 (Baker GRF-336)

EBENACEAE

Diospyros virginiana L.; persimmon; LF, PHF, PSG, RD, RI, SL, SSB; 4 (Witsell 05-535, Baker GRF-107)

ERICACEAE

Lyonia ligustrina (L.) DC.; maleberry; DW, NS, SSB; 2 (Baker GRF-089)

Rhododendron prinophyllum (Small) Millais; mountain azalea; NS, RI/NS, SSB; 3 (Witsell 05-271)

Vaccinium arboreum Marshall; farkleberry; PHF, RI, SG, SSB; 5 (Witsell 05-509, Baker GRF-104)

Vaccinium fuscatum Aiton; highbush blueberry; DW; 1 (Baker GRF-063)

Vaccinium pallidum Aiton; lowbush blueberry; NS, PHF, RI; 4 (Baker GRF-017)

Vaccinium stamineum L.; deerberry; NS, PHF; 4 (Baker GRF-062)

EUPHORBIACEAE

Acalypha monococca (Engelm. ex A. Gray) Lill. W. Mill. & Gandhi; one-seeded mercury; SG; 1 (Witsell 05-1323)

Acalypha virginica L.; Virginia copperleaf; PF, PHF, SL, SSB; 3 (Witsell 05-738, Baker GRF-255)

Chamaesyce maculata (L.) Small; spotted spurge; RD, SL; 3 (Baker GRF-244)

**Chamaesyce nutans* (Lag.) Small; nodding spurge; RI, SL; 2 (Witsell 05-1196, Baker GRF-315)
Croton glandulosus L. var. *septrionalis* Müll.-Arg.; tropic croton; RD; 1 (Baker GRF-291)
Croton monanthogynus Michx.; prairie tea; SG/RI; 2 (Baker GRF-258)
Croton willdenowii G. L. Webster; rushfoil; RD, SG, SL; 3 (Baker GRF-216)
Euphorbia commutata Engelm.; wood spurge; RI; 1 (not collected)
Euphorbia corollata L.; flowering spurge; SG; 2 (Baker GRF-305)
Phyllanthus caroliniensis Walter var. *caroliniensis*; leaf-flower; RI, SL; 2 (Baker GRF-271)

FABACEAE

Amorpha nitens F. E. Boynton; false indigo; NS, RI, SP/SG, SP; 3 (Baker GRF-078)
Amphicarpaea bracteata (L.) Fernald; hog peanut; NS, RI; 1 (not collected)
Apios americana Medik.; groundnut; LF, RI, SL; 3 (Baker GRF-269)
Astragalus distortus Torr. & A. Gray var. *engelmannii* (E. Sheld.) M. E. Jones; Engelmann's milkvetch; SG; 1 (Witsell 05-237)
Baptisia bracteata Muhl. ex Willd. var. *leucophaea* (Nutt.) Kartesz & Gandhi; cream false indigo; PHF, RI; 2 (Witsell 05-279)
Cercis canadensis L. var. *canadensis*; eastern redbud; RD; 2 (Witsell 05-22)
Chamaecrista nictitans (L.) Moench var. *nictitans*; sensitive partridge pea; PSG, RD, SL; 3 (Witsell 05-1186, Baker GRF-262)
Clitoria mariana L.; butterfly pea; PHF; 3 (Baker GRF-302)
Crotalaria sagittalis L.; rattlebox; PSG; 1 (Witsell 05-627)
Desmodium laevigatum (Nutt.) DC.; beggar's lice; NS/SL, RD; 3 (Witsell 05-1182)
Desmodium marilandicum (L.) DC.; beggar's lice; RD; 3 (Witsell 05-1373, Baker-301)
Desmodium nudiflorum (L.) DC.; beggar's lice; NS, PF, PHF; 3 (not collected)
Desmodium paniculatum (L.) DC.; beggar's lice; LF, PHF; 2 (not collected)
Desmodium rotundifolium DC.; dollarleaf beggar's lice; PHF; 2 (Witsell 05-1300)
Desmodium viridiflorum (L.) DC.; beggar's lice; RD; 2 (Baker GRF-322)
Galactia regularis (L.) Britton, Stearns, & Poggenb.; milk pea; PHF, SG; 1 (not collected)
Gleditsia triacanthos L.; honeylocust; LF; 2 (Witsell 05-1305)
**Kummerowia striata* (Thunb.) Schindl.; Japanese bushclover; RD; 3 (Baker GRF-275)
**Lespedeza bicolor* Turcz.; bicolor lespedeza; RD; 1 (not collected)
**Lespedeza cuneata* (Dum. Cours.) G. Don; sericea lespedeza; LF, RD, RI, SG, SL; 4 (Baker GRF-295)
Lespedeza hirta (L.) Hornem. var. *hirta*; hairy bushclover; PHF, RD, SG; 3 (Baker GRF-334)
Lespedeza intermedia (S. Watson ex A. Gray) Britton; intermediate bushclover; PHF, SG; 1 (Witsell 05-1327)
Lespedeza procumbens Michx.; trailing bushclover; CC, PHF, SG; 3 (Witsell 05-1195)
Lespedeza repens (L.) W. P. C. Barton; creeping bushclover; CC, PHF, RD; 3 (Baker GRF-261)
Lespedeza stuevei Nutt.; tall bushclover; RD; 2 (Baker GRF-300)

Lespedeza virginica (L.) Britton; slender bushclover; RD, SG; 2 (Witsell 05-1180, Baker GRF-320)
Mimosa quadrivalvis L. var. *nuttallii* (DC.) Beard ex Barneby; sensitive brier; SG; 1 (Witsell 05-366)
Orbexilum pedunculatum (Mill.) Rydb. var. *pedunculatum*; Sampson's snakeroot; RI, SG; 1 (Witsell 05-550)
Rhynchosia latifolia Nutt. ex Torr. & A. Gray; snoutbean; PHF; 1 (not collected)
Senna marilandica (L.) Link; wild senna; RD, RI; 1 (not collected)
Strophostyles umbellata (Muhl. ex Willd.) Britton; wild bean; RD; 3 (Baker GRF-292)
Stylosanthes biflora (L.) Britton, Stearns, & Poggenb.; pencil flower; RD, SG; 2 (Baker GRF-114)
Tephrosia virginiana (L.) Pers.; goat's rue; PHF, RD, SSB; 3 (Baker GRF-171)
 **Trifolium campestre* Schreb.; hop clover; RD; 2 (Baker GRF-033)
 **Trifolium dubium* Sibth.; low hop clover; RD; 2 (Witsell 05-227)
Trifolium reflexum L.; buffalo clover; RD; 1 (Baker GRF-082)
 **Trifolium repens* L.; white clover; RD; 2 (Baker GRF-101)
Vicia minutiflora F. Dietr.; smallflower vetch; RI, SG, SP; 2 (Witsell 05-111)
 **Vicia sativa* L.; common vetch; RD; 2 (Witsell 05-98, Baker GRF-094)

FAGACEAE

Quercus alba L.; white oak; NS, PF, PHF, RI; 5 (Witsell 05-1376)
Quercus falcata Michx.; southern red oak; CC, NS, PF, PHF; 4 (Witsell 05-1377)
Quercus marilandica Münchh.; blackjack oak; PHF, SG; 4 (Witsell 05-792)
Quercus muhlenbergii Engelm.; chinquapin oak; PHF, RD, RI, SSB; 3 (Witsell 05-1184)
Quercus nigra L.; water oak; DW, LF, RI; 4 (Witsell 05-745)
Quercus phellos L.; willow oak; LF; 3 (Witsell 05-755)
Quercus rubra L.; northern red oak; NS, PHF; 4 (Witsell 05-793)
Quercus stellata Wangenh.; post oak; PHF, SG, SSB; 4 (Witsell 05-794)
Quercus velutina Lam. in Lam. et al.; black oak; CC, PF, PHF; 4 (not collected)

GENTIANACEAE

Sabatia angularis (L.) Pursh; winged rosepink; LF, RD, RI, SG; 2 (Witsell 05-740)

GERANIACEAE

Geranium carolinianum L. var. *carolinianum*; Carolina cranesbill; RD; 2 (Baker GRF-088)
Geranium maculatum L.; wild geranium; NS; 2 (Witsell 05-238)

HIPPOCASTANACEAE

Aesculus pavia L.; red buckeye; NS, PHF, RD, SP; 4 (Witsell 05-101, Baker GRF-040)

HYDRANGEACEAE

Hydrangea arborescens L.; wild hydrangea; NS/SSB; 1 (not collected)
Philadelphus pubescens Loisel.; mock orange; NS/SSB; 1 (Witsell 05-634)

HYDROPHYLLACEAE

Phacelia hirsuta Nutt.; hairy scorpionweed; RI/SG; 2 (Witsell 05-234)

JUGLANDACEAE

Carya cordiformis (Wangenh.) K. Koch; bitternut hickory; NS; 2 (Baker GRF-358)
Carya laciniosa (F. Michx.) Loudon; shellbark hickory; NS/SL; 2 (Baker GRF-288)
Carya texana Buckley; black hickory; PHF, RD, SG; 4 (Baker GRF-287)
Carya tomentosa (Poir.) Nutt.; mockernut hickory; NS, PHF; 4 (Baker GRF-344)
Juglans nigra L.; black walnut; NS, RD, RI; 2 (Witsell 05-651)

LAMIACEAE

Cunila origanoides (L.) Britton; dittany; CC, NS, PHF, SSB; 3 (Baker GRF-304)
Hedeoma hispida Pursh; false pennyroyal; RD; 3 (Witsell 05-393, Baker GRF-113)
Lycopus rubellus Moench.; water horehound; DW, RI, SP; 3 (Witsell 05-1177, Baker GRF-316)
Monarda bradburiana L. C. Beck; Bradbury beebalm; CC, PHF, RD; 3 (Witsell 05-273, Baker GRF-087)
Monarda fistulosa L. var. *fistulosa*; beebalm; NS, PHF, RD; 3 (Baker GRF-230)
**Perilla frutescens* (L.) Britton; beefsteak plant; LF, RD, RI, SL; 3 (Witsell 05-1170)
Prunella vulgaris L. subsp. *lanceolata* (W. P. C. Barton) Hultén; heal-all; RD, RI, SP; 3 (Witsell 05-406, Baker GRF-116)
Pycnanthemum albescens Torr. & A. Gray; frosted mountain mint; PHF, RD, RI; 3 (Baker GRF-240)
Pycnanthemum tenuifolium Schrad.; slender mountain mint; CC, DW, RD, RI, SG; 4 (Witsell 05-682, Baker GRF-231)
Salvia lyrata L.; lyre-leaved sage; RD, RI, SP; 3 (Baker GRF-035)
Scutellaria elliptica Muhl. ex Spreng. var. *elliptica*; hairy skullcap; PHF, RI; 3 (Witsell 05-540, Baker GRF-145)
Scutellaria ovata Hill; heartleaf skullcap; NS, PHF, RD, RI; 3 (Baker GRF-180)
Scutellaria parvula Michx. var. *australis* Fassett; little skullcap; SG, SP; 3 (Witsell 05-368, Baker-051)
Stachys tenuifolia Willd. var. *tenuifolia*; smooth hedgenettle; LF; 2 (Baker GRF-215)
Teucrium canadense L. var. *canadense*; germander; RD; 1 (Witsell 05-680, Baker GRF-225)
Trichostema dichotomum L.; forked blue curls; SG, SL, SSB; 2 (Baker GRF-325)

LAURACEAE

Sassafras albidum (Nutt.) Nees; sassafras; PHF, RD; 3 (Baker GRF-221)

LINACEAE

Linum medium (Planch.) Britton var. *texanum* (Planch.) Fernald; Texas flax; RD, SG; 2
(Witsell 05-633)

Linum striatum Walter; yellow flax; LF, PSG; 2 (Witsell 05-628, Baker GRF-217)

LOGANIACEAE

Spigelia marilandica L.; Indian-pink; RI, SP; 2 (Witsell 05-514, Baker GRF-141)

LYTHRACEAE

Ammannia Xcoccinea Rottb.; toothcup; SL; 3 (Witsell 05-802)

Rotala ramosior (L.) Koehne; toothcup; SL; 4 (Witsell 05-737, Baker GRF-306)

MALVACEAE

Hibiscus mocsheutos L. subsp. *lasiocarpus* (Cav.) O. J. Blanch.; rose mallow; PSG, SL; 3
(Witsell 05-805, Baker GRF-278)

MELASTOMATACEAE

Rhexia mariana L. var. *mariana*; meadow beauty; PSG; 1 (Witsell 05-743)

Rhexia virginica L.; winged-stem meadow beauty; PSG; 1 (Witsell 05-733)

MELIACEAE

**Melia azedarach* L.; chinaberry; CC, RD; 1 (Witsell 05-547)

MENISPERMACEAE

Cocculus carolinus (L.) DC.; Carolina moonseed; RD, RI, SG; 3 (not collected)

MOLLUGINACEAE

Mollugo verticillata L.; carpetweed; RI/SL; 2 (Baker GRF-270)

MONOTROPACEAE

Monotropa hypopithys L.; pinesap; NS; 1 (Witsell 05-654)

MORACEAE

Morus rubra L.; red mulberry; LF, NS; 2 (Witsell 05-758)

NYSSACEAE

Nyssa sylvatica Marshall; blackgum; PF, PHF; 4 (Witsell 05-757)

OLEACEAE

Chionanthus virginicus L.; fringe tree; PHF, RI, SG, SSB; 4 (Baker GRF-066)

Fraxinus americana L.; white ash; NS, PHF, RI, SG; 3 (Baker GRF-184)

Fraxinus pennsylvanica Marshall; green ash; LF, SL; 3 (Witsell 05-228, Baker GRF-064)

**Ligustrum sinense* Lour.; Chinese privet; LF, RD, RI; 2 (Witsell 05-526, Baker GRF-152)

ONAGRACEAE

Gaura longiflora Spach; gaura; NS/SL; 1 (Witsell 05-1372)

Ludwigia alternifolia L.; seedbox; RI, SL; 2 (not collected)

Ludwigia decurrens Walter; winged seedbox; SL; 3 (Witsell 05-1324)

Ludwigia glandulosa Walter; primrose willow; PSG; 1 (Witsell 05-734)

Oenothera biennis L.; evening primrose; SL; 1 (not collected)

Oenothera fruticosa L.; sundrops; SG; 2 (Witsell 05-365)

Oenothera laciniata Hill; cutleaf evening primrose; RD; 2 (Baker GRF-117)

Oenothera linifolia Nutt.; threadleaf evening primrose; SG; 2 (Witsell 05-363, Baker GRF-142)

OXALIDACEAE

Oxalis dillenii Jacq.; yellow wood sorrel; RD; 2 (Baker GRF-048)

Oxalis violacea L.; violet wood sorrel; PHF, SG, SSB; 3 (Witsell 05-94)

PAPAVERACEAE

Sanguinaria canadensis L.; bloodroot; NS; 1 (Witsell 05-103)

PASSIFLORACEAE

Passiflora incarnata L.; purple passion flower; RD, RI; 1 (Witsell 05-1375)

Passiflora lutea L.; yellow passion flower; DW, LF, RI; 3 (Witsell 05-1192)

PHYTOLACCACEAE

Phytolacca americana L. var. *americana*; pokeweed; PHF, SL; 2 (Baker GRF-327)

PLANTAGINACEAE

Plantago aristata Michx.; bracted plantain; RD; 3 (Baker GRF-207)

Plantago elongata Pursh; dwarf plantain; RD; 3 (Baker GRF-027)

**Plantago lanceolata* L.; English plantain; RD; 2 (Baker GRF-118)

Plantago virginica L.; hoary plantain; RD, SG; 3 (Baker GRF-028)

PLATANACEAE

Platanus occidentalis L.; sycamore; NS, RI, SL; 3 (Witsell 05-384)

POLEMONIACEAE

Phlox divaricata L. subsp. *laphamii* (A. W. Wood) Wherry; blue phlox; NS; 2 (Witsell 05-104)

Phlox pilosa L. subsp. *pilosa*; hairy phlox; PHF, RD; 2 (Witsell 05-274)

POLGALACEAE

Polygala sanguinea L.; purple milkwort; SG; 1 (Witsell 05-629)

POLYGONACEAE

Brunnichia ovata (Walter) Shinnery; ladies' eardrops; LF, SL, SSB; 3 (Witsell 05-751)

Fallopia scandens (L.) Holub; vining buckwheat; LF; 1 (not collected)

Persicaria hydropiperoides (Michx.) Small; wild water pepper; LF, RD, SL; 2 (Witsell 05-1314, Baker-283)

Persicaria lapathifolia (L.) A. Gray; pale smartweed; RD, RI, SL; 2 (Witsell 05-1302)

**Persicaria longiseta* (Bruijn) Kitagawa; smartweed; SL; 2 (Baker GRF-347)

Persicaria pensylvanica (L.) M. Gómez; pinkweed; SL; 2 (Witsell 05-1315)

Persicaria punctata (Elliott) Small; dotted smartweed; SL; 2 (Witsell 05-1181)

Polygonum tenue Michx.; pleatleaf knotweed; SG; 1 (Witsell 05-1325)

Rumex crispus L.; sour dock; RD; 2 (Baker GRF-103)

Rumex hastatulus Baldwin; sorrel; SG; 2 (Witsell 05-268, Baker GRF-147)

PORTULACACEAE

Claytonia caroliniana Michx.; Carolina spring beauty; SG; 1 (Witsell 05-113)

Claytonia virginica L.; spring beauty; DW, PHF, RD, RI, SG; 4 (Witsell 05-91, Baker GRF-014)

Phemeranthus rugospermus (Holz.) Kiger; rough-seeded fame flower; SG; 1 (Witsell 05-1183)

PRIMULACEAE

Lysimachia lanceolata Walter; loosestrife; RI; 2 (Baker GRF-202)

RANUNCULACEAE

Anemone virginiana L. var. *virginiana*; thimbleweed; PHF, SG; 3 (not collected)

Cimicifuga racemosa (L.) Nutt.; black cohosh; NS; 2 (not collected)

Clematis reticulata Walter; leather flower; NS, SG/SP; 2 (Witsell 05-635)
Delphinium carolinianum Walter subsp. *carolinianum*; Carolina larkspur; RD, SG; 2 (Baker GRF-140)
Delphinium tricornis Michx.; dwarf larkspur; NS; 2 (Witsell 05-231)
Ranunculus abortivus L.; little crowfoot; RI; 1 (Witsell 05-226)
Ranunculus fascicularis Muhl. ex J. M. Bigelow; prairie buttercup; PHF, SG; 2 (Baker GRF-057)
Ranunculus harveyi (A. Gray) Britton var. *harveyi*; Harvey's buttercup; NS; 2 (Witsell 05-84, Baker-021)
Ranunculus micranthus Nutt. in Torr. & A. Gray; smallflower crowfoot; NS, PHF; 2 (Witsell 05-239)
 **Ranunculus sardous* Crantz; hairy buttercup; RI; 1 (Witsell 05-265)
Thalictrum thalictroides (L.) A. J. Eames & B. Biovin; rue anemone; DW, NS, PHF, RI, SG; 5 (Baker GRF-006)

RHAMNACEAE

Berchemia scandens (Hill) K. Koch; rattan vine; LF, RI, SSB; 2 (Baker GRF-200)
Ceanothus americanus L.; New Jersey tea; RD, RI, SG; 2 (Witsell 05-537)
Frangula caroliniana (Walter) A. Gray; Carolina buckthorn; NS, PHF, RD; 3 (Witsell 05-546, Baker-105)

ROSACEAE

Agrimonia rostellata Wallr.; agrimony; NS, RI; 3 (not collected)
Amelanchier arborea (F. Michx.) Fernald; serviceberry; PHF, SSB; 3 (Witsell 05-21)
Crataegus intricata Lange; hawthorn; PHF; 2 (Baker GRF-061)
Crataegus uniflora Münchh.; dwarf hawthorn; PHF, SG; 3 (Witsell 05-253, Baker GRF-214)
Geum canadense Jacq.; white avens; NS; 3 (not collected)
Potentilla simplex Michx.; cinquefoil; RD, RI, SG; 3 (Baker GRF-047)
Prunus americana Marshall; American plum; PHF; 2 (Witsell 05-23, Baker GRF-020)
Prunus mexicana S. Watson; big tree plum; RI; 1 (Witsell 05-518, Baker GRF-154)
Prunus serotina Ehrh.; black cherry; CC, NS, PF, PHF, SG, SSB; 4 (Witsell 05-1374)
Rosa carolina L.; Carolina rose; SG; 1 (Witsell 05-530, Baker GRF-136)
Rubus argutus Link; southern blackberry; RD; 3 (Baker GRF-085)
Rubus flagellaris Willd.; northern dewberry; RD; 3 (Baker GRF-054)

RUBIACEAE

Cephalanthus occidentalis L.; buttonbush; PSG, RI, SL; 4 (Witsell 05-677)
 **Cruciata pedemontana* (Bell.) Ehrend.; bedstraw; RD; 2 (Witsell 05-247)
Diodia teres Walter; poorjoe; PSG, RD, SG, SL; 3 (Baker GRF-256)
Diodia virginiana L.; buttonweed; PSG, RI, SL; 3 (Baker GRF-190)
Galium aparine L.; cleavers; NS, RD, RI; 2 (Baker GRF-052)
Galium circaeazans Michx.; licorice bedstraw; NS; 3 (Witsell 05-538, Baker GRF-169)

Galium concinnum Torr. & A. Gray; bedstraw; NS; 3 (Witsell 05-631, Baker GRF-213)
Galium pilosum Aiton; hairy bedstraw; NS, PHF, RD; 3 (Baker GRF-236)
Hedyotis australis Lewis & Moore; white bluets; RD; 1 (Witsell 05-92)
Hedyotis caerulea (L.) Hook.; bluets; DW, RD, RI, SG; 3 (Witsell 05-99)
Hedyotis crassifolia Raf.; star violet; RD; 3 (Baker GRF-011)
Hedyotis longifolia (Gaertn.) Hook. var. *longifolia*; long-leaved bluets; PHF, SG; 3 (Witsell 05-242)
Hedyotis purpurea (L.) Torr. & A. Gray; mountain houstonia; RI; 2 (Witsell 05-512, Baker GRF-143)
Mitchella repens L.; partridge berry; DW, NS, RI, SSB, SP; 3 (Baker GRF-151)
Oldenlandia boscii (DC.) Chapm.; bluets; SL; 4 (Witsell 05-735, Baker GRF-340)
**Sherardia arvensis* L.; field madder; RD, RI; 2 (Baker GRF-023)

SALICACEAE

Salix caroliniana Michx.; Carolina willow; RI; 3 (Witsell 05-226, Baker GRF-077)
Salix nigra Marshall; black willow; RI/RD, SL; 1 (Baker GRF-226)

SANTALACEAE

Commandra umbellata (L.) Nutt. subsp. *umbellata*; bastard toadflax; PHF; 2 (Witsell 05-232)

SAPOTACEAE

Sideroxylon lanuginosum Michx.; gum bumelia; NS, PHF, SG; 3 (Baker GRF-164)

SAXIFRAGACEAE

Heuchera americana L. var. *americana*; American alumroot; NS, SG, SSB; 3 (Baker GRF-056)
Heuchera americana L. var. *hirsuticaulis* (Wheelock) Rosend., Butters, & Lakela; American alumroot; NS/SSB; 2 (Baker GRF-172)
Saxifraga palmeri Bush; Palmer's saxifrage; SG, SP, SSB; 3 (Witsell 05-19, Baker GRF-008)

SCROPHULARIACEAE

Agalinis tenuifolia (Vahl) Raf.; gerardia; SG, SL/SSB; 2 (Witsell 05-1179, Baker GRF-323)
Aureolaria flava (L.) Farw.; yellow false foxglove; PHF, RI; 2 (not collected)
Gratiola virginiana L. var. *virginiana*; hedge-hyssop; RI; 2 (Witsell 05-364)
Lindernia dubia (L.) Pennell; false pimpernel; RI, SL; 2 (Baker GRF-250)
Mecardonia acuminata (Walter) Small; purple axil-flower; PSG, RI, RI/SG; SSB/SL; 3 (Witsell 05-810)
Nuttallanthus texanus (Scheele) D. A. Sutton; blue toadflax; RD; 2 (Witsell 05-235)

Pedicularis canadensis L.; lousewort; RI; 2 (Witsell 05-95)
Penstemon arkansanus Pennell; Arkansas beard-tongue; SG/RI, SSB; 2 (Baker GRF-080)
Penstemon digitalis Nutt. ex Sims; foxglove beard-tongue; RD; 2 (Witsell 05-549)
Penstemon tubaeiflorus Nutt.; whitewand beard-tongue; RD, SG/RI; 3 (Baker GRF-138)
**Verbascum thapsus* L.; woolly mullein; CC, RD, SL; 2 (Baker GRF-239)
**Veronica arvensis* L.; corn speedwell; RD; 3 (Baker GRF-030)
Veronica peregrina L. subsp. *peregrina*; necklace weed; RD; 3 (Baker GRF-026)

SIMAROUBACEAE

**Ailanthus altissima* (Mill.) Swingle; tree-of-heaven; CC, RD; 1 (Witsell 05-536)

SOLANACEAE

Physalis angulata L.; smooth groundcherry; SL; 2 (Witsell 05-1371)
Physalis heterophylla Nees; clammy groundcherry; RD; 1 (Witsell 05-222)
Physalis pubescens L.; downy groundcherry; RI, SL; 3 (Witsell 05-1369, Baker GRF-266)
Solanum carolinense L.; Carolina horsenettle; RD; 3 (Witsell 05-541, Baker GRF-096)

STAPHYLEACEAE

Staphylea trifolia L.; bladdernut; NS; 2 (Witsell 05-653)

STYRACACEAE

Styrax grandifolius Aiton; big-leaved snowbell; SSB/PHF; 2 (Witsell 05-278, Baker GRF-195)

THYMELAEACEAE

Dirca palustris L.; leatherwood; PHF; 1 (Witsell 05-107)

TILIACEAE

Tilia americana L. var. *americana*; basswood; NS; 3 (Witsell 05-637, Baker GRF-165)

ULMACEAE

Ulmus alata Michx.; winged elm; CC, PHF, RD, SG, SSB; 4 (Baker GRF-106)
Ulmus americana L.; American elm; SSB; 2 (Baker GRF-223)

URTICACEAE

Boehmeria cylindrica (L.) Sw.; false nettle; RI, SL; 3 (Baker GRF-252)
Parietaria pensylvanica Muhl. ex Willd.; pellitory; NS/SSB; 2 (Baker GRF-173)

VALERIANACEAE

Valerianella radiata (L.) Dufr.; cornsalad; RD, RI, SG; 3 (Baker GRF-031)

VERBENACEAE

Callicarpa americana L.; beautyberry; PHF, RD; 3 (Witsell 05-1378, Baker GRF-357)

Glandularia canadensis (L.) Nutt.; rose vervain; RD, SG; 2 (Witsell 05-26)

Verbena urticifolia L.; white vervain; RD, RI; 2 (Witsell 05-681, Baker GRF-247)

VIOLACEAE

Hybanthus concolor (T. F. Forst.) Spreng.; green violet; NS/SSB; 1 (Witsell 05-245)

Viola bicolor Pursh; Johnny jump-up; RD; 3 (Baker GRF-012)

Viola canadensis L. var. *canadensis*; Canada white violet; NS; 1 (Baker GRF-084)

Viola palmata L.; lobed violet; PHF, RD; 3 (Witsell 05-241)

Viola pedata L.; bird's foot violet; PHF, SG, SSB; 3 (Baker GRF-016)

Viola pubescens Aiton; yellow violet; NS; 1 (Witsell 05-102)

Viola sagittata Aiton; arrowleaf violet; RI, SG; 2 (Witsell 05-100)

Viola sororia Willd.; blue violet; NS, RD, RI; 3 (Witsell 05-87)

VITACEAE

Parthenocissus quinquefolia (L.) Planch.; Virginia creeper; NS, PHF, RD, RI; 4 (not collected)

Vitis aestivalis Michx.; possum grape; NS, RD, RI; 3 (Witsell 05-796)

Vitis rotundifolia Michx.; muscadine; CC, NS, PHF, RD, RI; 3 (Baker GRF-183 Witsell 05-1309,)

ANGIOSPERMS (MONOCOTS)

AGAVACEAE

Camassia scilloides (Raf.) Cory; wild hyacinth; SG; 1 (Baker GRF-049)

Manfreda virginica (L.) Salisb. ex Rose; false aloe; SG/RI; 1 (Witsell 05-1198)

ALLIACEAE

Allium canadense L. var. *canadense*; wild onion; RI; 1 (Baker GRF-146)

Allium canadense L. var. *mobile* (Regel) Ownbey; purple onion; RI/SG; 1 (Witsell 05-529)

**Allium vineale* L.; field garlic; LF, RD; 2 (Baker GRF-109)

Nothoscordum bivalve (L.) Britton in Britton & A. Br.; false garlic; SG; 3 (Witsell 05-89, Baker GRF-022)

AMARYLLIDACEAE

**Narcissus Xodorus* L.; jonquil; RD/NS; 1 (Witsell 05-25)

**Narcissus pseudonarcissus* L.; daffodil; RD/NS; 1 (Baker GRF-359)

ARACEAE

Arisaema dracontium (L.) Schott in Schott & Endl.; green dragon; LF, RI, SP/SG; 1
(Baker GRF-166)

COLCHICACEAE

Uvularia sessilifolia L.; sessile bellwort; NS; 1 (not collected)

COMMELINACEAE

**Commelina communis* L.; Asiatic dayflower; RI, SL; 2 (Baker GRF-267)

Tradescantia ohiensis Raf.; Ohio spiderwort; SG; 2 (not collected)

CYPERACEAE

Carex albicans Willd. ex Spreng.; sedge; NS, PHF, SSB; 3 (Witsell 05-218)

Carex albolutescens Schwein.; sedge; DW; 1 (Witsell 05-375)

Carex blanda L. H. Dewey; woodland sedge; NS, RD, RI; 4 (Witsell 05-216, Baker GRF-069)

Carex bushii Mack.; Bush's sedge; SG/RI; 2 (Witsell 05-385, Baker GRF-092)

Carex cephalophora Muhl. ex Willd.; sedge; NS, PHF, RD; 3 (Witsell 05-370, Baker GRF-044)

Carex complanata Torr. & Hook.; sedge; DW; 2 (Witsell 05-377)

Carex digitalis Willd.; sedge; LF; 1 (Witsell 05-367)

Carex festucacea Schkuhr ex Willd.; sedge; DW; 2 (Witsell 05-396)

Carex glaucoidea Tuck. ex Olney; blue sedge; DW, NS, RD, RI; 3 (Witsell 05-380, Baker GRF-036)

Carex hirsutella Mack.; sedge; CC, DW, LF, PHF, RD, RI, SG; 5 (Baker GRF-120)

Carex hirsutella Mack. X *swanii* (Fernald) Mack.; hybrid sedge; PF; 1 (Witsell 05-548)
[Det. by T. Smith of U. of Ontario]

Carex intumescens Rudge; sedge; LF; 2 (Witsell 05-217)

Carex jamesii Schwein.; James' sedge; NS; 1 (Witsell 05-374)

Carex leavenworthii L. H. Dewey; Leavenworth's sedge; NS, RD, SG; 3 (Witsell 05-371)

Carex lupuliformis Sartwell ex L. H. Dewey; false hop sedge; DW, LF; 2 (Witsell 05-372)

Carex lupulina Willd.; hop sedge; LF, PSG; 3 (Witsell 05-744, Baker GRF-191)

Carex muehlenbergii Schkuhr ex Willd. var. *enervis* Boott; sedge; PF, PHF, RD, RI; 3
(Witsell 05-255, Baker GRF-034)

Carex oklahomensis Mack.; Oklahoma sedge; RI/SG/SP; 1 (Witsell 05-510, Baker GRF-210)
Carex oligocarpa Willd.; sedge; NS, PHF, RD, SSB; 3 (Witsell 05-252)
Carex oxylepis Torr. & Hook.; sedge; PF; 1 (Witsell 05-373)
Carex planispicata Naczi; sedge; NS, PHF, RD, RI; 3 (Witsell 05-221)
Carex rosea Schkuhr ex Willd.; sedge; NS; 2 (Witsell 05-369, Baker GRF-178)
Carex molestiformis Reznicek & P. E. Rothrock; sedge; RD; 1 (Baker GRF-121)
***Carex swanii* (Fernald) Mack.**; Swan's sedge; DW, PF, PHF; 2 (Witsell 05-250)
Carex tribuloides Walenb.; bristlebract sedge; DW, LF; 3 (Witsell 05-543)
Carex typhina Michx.; cattail sedge; LF, PSG; 2 (Witsell 05-644, Baker GRF-192)
Carex umbellata Schkuhr ex Willd.; sedge; PHF, SSB; 2 (Witsell 05-220)
Carex vulpinoidea Michx.; sedge; DW, RD, RI; 2 (Witsell 05-389)
Cyperus echinatus (L.) A. W. Wood; hedgehog clubrush; RD; 2 (Witsell 05-1163, Baker GRF-212)
Cyperus erythrorhizos Muhl.; redroot flatsedge; SL; 2 (Witsell 05-1333)
**Cyperus esculentus* L.; yellow nutsedge; SL; 3 (Witsell 05-1316, Baker GRF-337)
Cyperus pseudovegetus Steud.; marsh flatsedge; PSG; 3 (Baker GRF-188)
Cyperus retroflexus Buckley; oneflower flatsedge; RD; 1 (Witsell 05-1174)
Cyperus retrorsus Chapm.; flatsedge; NS, SL; 2 (Witsell 05-1368)
Cyperus squarrosus L.; nutsedge; PSG, SL; 3 (Witsell 05-746, Baker GRF-310)
Cyperus strigosus L.; false nutsedge; SG/RI; 2 (Baker GRF-265)
Eleocharis acicularis (L.) Roem. & Schult. in Roem. et al.; least spikerush; SL; 4 (Witsell 05-801)
Eleocharis lanceolata Fernald; spikerush; RD; 3 (Witsell 05-648, Baker GRF-208)
Eleocharis palustris (L.) Roem. & Schult. in Roem. et al.; spikerush; RI/SG; 1 (Witsell 05-645)
Eleocharis tenuis (Willd.) Schult. var. *verrucosa* (Svenson) Svenson; slender spikerush; DW, RI/SG, SP; 3 (Witsell 05-647)
Fimbristylis autumnalis (L.) Roem. & Schult. in Roem. et al.; slender fimbry; PSG, SL; 3 (Witsell 05-803, Baker GRF-311)
Fimbristylis vahlii (Lam.) Link; Vahl's fimbry; SL; 4 (Witsell 05-741, Baker GRF-309B)
Isolepis pseudosetacea (Daveau) Gand.; bulrush; RI/SG; 2 (Witsell 05-86, Baker GRF-070)
Lipocarpus micrantha (Vahl) G. C. Tucker; half-chaff sedge; PSG, SL; 4 (Witsell 05-739, Baker GRF-309A)
Rhynchospora capitellata (Michx.) Vahl; brown beaksedge; SG/RI; 2 (Baker GRF-277)
Rhynchospora recognita (Gale) Kral; globe beaksedge; DW, RI/SG; 3 (Witsell 05-639, Baker GRF-150)
Schoenoplectus pungens (Vahl) Palla; chairmaker's bulrush; PSG; 1 (Witsell 05-798)
Scirpus cyperinus (L.) Kunth; woolgrass bulrush; RD; 1 (Baker GRF-263)
Scirpus georgianus R. M. Harper; bulrush; DW, RI; 2 (Witsell 05-642)
Scirpus pendulus Muhl.; bulrush; RI; 2 (Witsell 05-511)
Scleria oligantha Michx.; nutsedge; DW, NS, PF, PHF, SG; 4 (Baker GRF-158)

DIOSCOREACEAE

**Dioscorea polystachya* Turcz.; air potato; RI; 3 (Witsell 05-797)
Dioscorea villosa L.; wild yam; DW, NS, PHF, SSB; 3 (Witsell 05-679, Baker GRF-168)

HEMEROCALLIDACEAE

**Hemerocallis fulva* (L.) L.; orange daylily; RD; 1 (not collected)

HYACINTHACEAE

**Ornithogalum umbellatum* L.; star of Bethlehem; SG/SP; 1 (not collected)

HYPOXIDACEAE

Hypoxis hirsuta (L.) Coville; yellow stargrass; RI/SG, SG; 4 (Witsell 05-90)

IRIDACEAE

**Belamcanda chinensis* (L.) DC. in Redouté; blackberry lily; PHF; 1 (not collected)
Iris cristata Sol. ex Aiton; dwarf crested iris; NS, RD; 3 (Witsell 05-236)
Nemastylis nuttallii Pichering ex R. C. Foster; Nuttall's pleatleaf; RI/SG; 1 (Witsell 05-632)
Sisyrinchium angustifolium Mill.; blue-eyed grass; PHF, RD, RI; 2 (Witsell 05-233)
Sisyrinchium langloisii Greene; blue-eyed grass; PHF, RD, SG; 2 (Witsell 05-277)

JUNCACEAE

Juncus acuminatus Michx.; knotty-leaved rush; RI; 2 (Baker GRF-206)
Juncus brachycarpus Engelm. in A. Gray; rush; RI; 2 (not collected)
Juncus debilis A. Gray; rush; DW, RI, SP; 2 (Baker GRF-149)
Juncus dudleyi Wiegand; Dudley's rush; RI; 2 (Baker GRF-203)
Juncus effusus L.; soft rush; DW, RD, RI; 3 (Witsell 05-649, Baker GRF-251)
Juncus marginatus Rostk.; rush; RI; 1 (Witsell 05-640)
Juncus secundus P. Beauv. ex Poir. in Lam. et al.; rush; RI; 3 (Witsell 05-641)
Juncus tenuis Willd.; path rush; RD; 3 (Baker GRF-134)
Juncus validus Coville var. *validus*; rush; SL; 1 (Witsell 05-754)
Luzula echinata (Small) F. J. Herm.; wood rush; NS, SSB; 4 (Baker GRF-018)

LILIACEAE

Erythronium albidum Nutt.; white trout lily; NS, PHF, SG, SP; 4 (Baker GRF-002)
Erythronium rostratum W. Wolf; yellow trout lily; NS; 1 (Baker GRF-005)

MELANTHIACEAE

Trillium recurvatum Beck; purple trillium; NS, PHF, SP/SG; 3 (Witsell 05-106)

ORCHIDACEAE

- Liparis liliifolia* (L.) Rich. ex Lindl.; lily-leaf twayblade orchid; DW; 1 (Baker GRF-071)
Malaxis unifolia Michx.; green adder's mouth orchid; DW; 1 (Baker GRF-072)
Spiranthes cernua (L.) Rich.; nodding ladies' tresses; DW, RI, SP; 3 (Baker GRF-345)
Spiranthes tuberosa Raf.; little ladies' tresses PHF, RI/SG; 2 (Witsell 05-1178, Baker GRF-303)
Tipularia discolor (Pursh) Nutt.; crane-fly orchid; PHF, SG; 2 (Witsell 05-243)

POACEAE

- Agrostis elliottiana* Schult.; Elliott's bentgrass; RI/SG; 1 (Witsell 05-407)
Agrostis hyemalis (Walter) Britton, Stearns, & Poggenb.; ticklegrass; RD, RI, SG; 4 (Witsell 05-399, Baker GRF-132)
Agrostis perennans (Walter) Tuck.; autumn bentgrass; DW, RI, SP; 2 (Witsell 05-1189)
**Aira elegans* Willd. ex Kunth; hairgrass; RD; 4 (Witsell 05-398, Baker GRF-102)
Andropogon ternarius Michx. var. *ternarius*; splitbeard bluestem; RD, SG; 2 (Witsell 05-1306, Baker GRF-356)
Andropogon virginicus L.; broomsedge bluestem; CC, LF, PHF, RD, SG; 4 (Witsell 05-1303)
Aristida dichotoma Michx. var. *curtissii* A. Gray; churchmouse three-awn; SG; 2 (Witsell 05-1301)
Aristida purpurascens Poir.; arrowfeather three-awn; SG; 2 (Witsell 05-1197)
Axonopus furcatus (Flüggé) Hitchc.; big carpetgrass; PSG; 3 (Baker GRF-342)
**Bromus commutatus* Schrad.; meadow brome; RD; 3 (Witsell 05-522)
**Bromus hordeaceus* L. subsp. *hordeaceus*; soft chess; RD; 4 (Witsell 05-403, Baker GRF-128)
Bromus pubescens Muhl. ex Willd.; hairy brome; NS, RD, RI; 4 (Witsell 05-655, Baker GRF-125)
**Bromus racemosus* L.; bald brome; RD; 3 (Witsell 05-281)
Chasmanthium latifolium (Michx.) H. O. Yates; river oats; RI, SP; 4 (Witsell 05-795, Baker GRF-276)
Cinna arundinacea L.; stout woodreed; RD; 1 (not collected)
**Dactylis glomerata* L.; orchard grass; CC, RD; 3 (Witsell 05-264)
Danthonia spicata (L.) P. Beauv. ex Roem. & Schult.; poverty oats; CC, PHF, SG; 3 (Witsell 05-391)
Dichanthelium acuminatum (Sw.) Gould & C. A. Clark subsp. *acuminatum*; hairy rosettegrass; SG; 2 (Witsell 05-516)
Dichanthelium boscii (Poir.) Gould & C. A. Clark; Bosc's rosettegrass; LF, NS, PHF, RD, RI; 4 (Witsell 05-394, Baker GRF-127)
Dichanthelium commutatum (Schult.) Gould; variable rosettegrass; NS, PHF, RI; 4 (Witsell 05-395, Baker GRF-075)
Dichanthelium depauperatum (Muhl.) Gould; starved rosettegrass; PHF, RD, SG; 3 (Witsell 05-388, Baker GRF-122)
Dichanthelium dichotomum (L.) Gould subsp. *dichotomum*; forked rosettegrass; LF, PHF, RD, SG, SL; 4 (Witsell 05-646, Baker GRF-133)

Dichanthelium dichotomum (L.) Gould subsp. *microcarpon* (Muhl. ex Elliott) Freckmann & Lelong; forked rosettegrass; RI; 2 (Baker GRF-204)

Dichanthelium dichotomum (L.) Gould subsp. *nitidum* (Lam.) Freckmann & Lelong; forked rosettegrass; RI; 1 (Witsell 05-542)

Dichanthelium laxiflorum (Lam.) Gould; spreading rosettegrass; PHF, RD, SG; 4 (Witsell 05-387, Baker GRF-039)

Dichanthelium linearifolium (Scribn.) Gould; linear-leaved rosettegrass; PHF, RD, RI, SG, SHB, SSB; 4 (Witsell 05-392, Baker GRF-038)

Dichanthelium polyanthes (Schult.) Mohlenbr.; many-flowered rosettegrass; RD, RI, SG; 4 (Witsell 05-515, Baker GRF-119)

Dichanthelium sphaerocarpon (Elliott) Gould; round-fruited rosettegrass; LF, RI, SG; 4 (Witsell 05-521, Baker GRF-189)

**Digitaria ciliaris* (Retz.) Koeler var. *ciliaris*; southern crabgrass; RD; 3 (Witsell 05-1202, Baker GRF-243)

**Digitaria ischaemum* (Schreb.) Muhl.; smooth crabgrass; RD; 3 (Witsell 05-1201)

Echinochloa muricata (P. Beauv.) Fernald var. *microstachya* Wiegand; barnyard grass; SL; 2 (Witsell 05-1331, Baker GRF-341)

Elymus canadensis L.; Canada wild rye; RI; 2 (Witsell 05-789, Baker GRF-260)

Elymus virginicus L.; Virginia wild rye; LF, PHF, RI; 2 (Witsell 05-790)

Eragrostis hypnoides (Lam.) Britton, Stearns, & Poggenb.; teal lovegrass; SL; 4 (Witsell 05-804, Baker GRF-312)

Eragrostis spectabilis (Pursh) Steud.; purple lovegrass; CC, RD; 3 (Witsell 05-1173, Baker GRF-298)

Festuca paradoxa Desv.; clustered fescue; SG; 1 (Witsell 05-652)

Festuca subverticellata (Pers.) E. B. Alexeev; nodding fescue; NS, RI; 2 (not collected)

**Hordeum pusillum* Nutt.; little barley; RD; 3 (Witsell 05-400, Baker GRF-130)

Leersia virginica Willd.; cutgrass; DW, LF, NS, RI, SP; 3 (Witsell 05-1169)

Melica mutica Walter; twoflower melicgrass; NS, RI, SG; 4 (Witsell 05-229)

Muhlenbergia sobolifera (Muhl. ex Willd.) Trin.; rock muhly; PHF, RD, SG; 3 (Witsell 05-1203)

Muhlenbergia sylvatica (Torr.) Torr. ex A. Gray; woodland muhly; RI; 3 (Witsell 05-1200, Baker GRF-348)

Panicum anceps Michx. subsp. *anceps*; beaked panicgrass; PF, PHF, RD, SG, SP; 4 (Witsell 05-1165, Baker GRF-299)

Panicum dichotomiflorum Michx. subsp. *dichotomiflorum*; fall panicgrass; RD, SL; 3 (Witsell 05-1171)

Panicum flexile (Gatt.) Scribn.; wiry witchgrass; RD; 2 (Baker GRF-332)

Panicum rigidulum Bosc ex Nees subsp. *rigidulum*; rigid panicgrass; LF, PSG, SL; 3 (Witsell 05-800, Baker GRF-343)

Paspalum laeve Michx.; field paspalum; PSG, RI; 3 (Witsell 05-1298, Baker GRF-264)

**Poa annua* L.; annual bluegrass; RD; 3 (Witsell 05-246)

Poa sylvestris A. Gray; woodland bluegrass; RI, SSB; 2 (Witsell 05-249)

Saccharum alopecuroides (L.) Nutt.; silver plumegrass; PF, PHF, RD; 2 (Witsell 05-1296)

**Schedonorus arundinaceus* Roem. & Schult. (nom. cons.); tall fescue; RD, RI, SG; 3 (Witsell 05-508, Baker GRF-155)

Schizachyrium scoparium (Michx.) Nash var. *scoparium*; little bluestem; PHF, SG; 1 (not collected)

Setaria parviflora (Poir.) Kerguélen; knotroot bristlegrass; SL; 2 (Witsell 05-1365)

Setaria pumila (Poir.) Roem. & Schult. subsp. *pumila*; yellow foxtail; RD; 2 (Baker GRF-242)

Sphenopholis intermedia (Rydb.) Rydb.; prairie wedgescale; NS, PHF, SSB; 2 (Witsell 05-225)

Sphenopholis nitida (Biehler) Scribn.; shining wedgescale; NS; 2 (Witsell 05-390, Baker GRF-179)

Sphenopholis obtusata (Michx.) Scribn.; prairie wedgescale; SSB; 2 (Baker GRF-124)

Sporobolus clandestinus (Biehler) Hitchc.; dropseed; SG; 2 (Witsell 05-1295)

Steinchisma hians (Elliott) Nash; gaping panicgrass; RI/SG; 2 (Witsell 05-678)

Tridens flavus (L.) Hitchc. var. *flavus*; purpletop; RD, SG; 3 (Witsell 05-1164, Baker GRF-296)

**Vulpia myuros* (L.) C. C. Gmel.; rattail six-weeks grass; RD; 3 (Witsell 05-397, Baker GRF-126)

Vulpia octoflora (Walter) Rydb. var. *octoflora*; common six-weeks grass; RD, SG; 3 (Witsell 05-401, Baker GRF-129)

RUSCACEAE

Maianthemum racemosum (L.) Link subsp. *racemosum*; false Solomon's seal; NS; 1 (not collected)

Polygonatum biflorum (Walter) Elliott; Solomon's seal; NS; 1 (not collected)

SMILACACEAE

Smilax bona-nox L.; bull greenbrier; DW, LF, RD, SL; 4 (Witsell 05-753)

Smilax glauca Walter; cat greenbrier; LF, SL; 3 (Witsell 05-756)

Smilax rotundifolia L.; common greenbrier; DW, LF, RI; 4 (Baker GRF-067)

Smilax tamnoides L.; bristly greenbrier; NS; 1 (not collected)

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Appendix A

Photographs of the Plant Communities of the South Fork Native Plant Preserve



Figure 10. Lowland Forest.



Figure 11. Shoreline habitat at the edge of Greers Ferry Lake. Note three distinctive zones: (left to right): 1) green ash/silver maple zone, 2) buttonbush zone, and 3) recently exposed sandy shoreline.



Figure 12. Perennial shoreline grassland.



Figure 13. Upland depression wetland.



Figure 14. Sandstone glade and woodland (situated on west-facing blufftop).



Figure 15. Sandstone glade with advanced cedar encroachment.



Figure 16. Sandstone bluff.



Figure 17. Shale bluff/outcrop. Note walking fern (*Asplenium rhizophyllum*).



Figure 18. Spring and spring run. Left: from source looking down spring run (growing season). Right: looking upstream toward source (winter).



Figure 19. Roadside habitat.



Figure 20. Upland pine-hardwood forest.



Figure 21. Shortleaf pine forest.



Figure 22. Clearcut.



Figure 23. Stream (forested segment) and riparian forest.



Figure 24. Stream (bedrock bottom segment) with adjacent sandstone glades.



Figure 25. Mesic north slope hardwood forest.