

**Floristic Survey of Dean Hills Nature Preserve
Fayette County, Illinois**

Submitted by:

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INTRODUCTION

Dean Hills Nature Preserve (DHNP), dedicated in 1985, is a 30-hectare tract of primarily mesic and dry-mesic upland forest communities. It is unusual in that it is located on a kame, a hill or mound of stratified drift deposited by glacial meltwater, formed during the Illinoian glacial epoch. Erosion of the kame has resulted in a rugged ridge and ravine topography at the preserve. DHNP is bordered by crop fields to the north and east, and by forest to the south and west. Most of the preserve is high quality second growth forest, however moderate grazing is believed to have occurred on some of the dryer ridge-tops.

In 1978, the Natural Areas Inventory determined that there were 54 acres of high quality (grade B) old second growth forest at this site. During several visits to DHNP and adjacent properties in 1995, John Schwegman of the IDNR listed 333 species in 84 families. These visits suggested that this site was floristically rich and of excellent natural quality, however, voucher specimens were not collected and no quantitative sampling was done. The purpose of this study was to document the vascular flora at DHNP and to determine the composition and structure of the upland and ravine forests.

MATERIALS AND METHODS

DHNP was visited every three to four weeks from April to October 2000. During each visit, voucher specimens were collected, plant communities were determined, and habitat data for each taxon were noted. Voucher specimens were identified and deposited in the herbarium of the Illinois Natural History Survey (ILLS), Champaign, Illinois. Criteria for designating native and non-native taxa followed Fernald (1950), Steyermark (1963), Mohlenbrock (1986), and Gleason and Cronquist (1991). Nomenclature follows Mohlenbrock (1986) and/or Gleason and Cronquist (1991). The plant communities were designated using the classification system of White and Madany (1978).

In June of 2001, the ridge and ravine forest communities were surveyed using 70 circular plots (0.04 ha in size) which were randomly located at 25 m intervals along four east-west transects. The plots were offset between 0 and 9 m to the north and south of the transect lines. The distance the plots were offset was determined by using a random numbers table (single digit). In each plot all living and dead-standing woody individuals with a dbh (diameter at breast height) of 10 cm or greater were identified and their diameters recorded. From the living-stem data, the density (stems/ha), basal area (m^2/ha), frequency (%), relative density, relative dominance, relative frequency, importance value, and average diameter (cm) were calculated for each tree species. Importance value was calculated as the sum of the relative density, relative dominance, and relative frequency for a given species divided by three. The densities of woody understory species were determined using circular plots (0.0001, 0.001, and 0.01 ha in size) nested within the 0.04 ha plots. Four additional 0.0001 ha circular plots were located 6 m from the center along the cardinal compass directions. In the 0.0001 ha plots tree seedlings (<50 cm tall) and shrubs were counted. In the 0.001 ha circular plots small sapling (≥ 50 cm tall and <2.5 dbh) were counted and in the 0.01 plots large saplings (≥ 2.5 to <10 cm dbh) were

counted. From these data, density (stems/ha), frequency (%), relative density, relative frequency, and importance value (IV) were calculated for each species in the large and small sapling and tree seedling and shrub categories. Importance value was calculated as the sum of relative density and relative frequency for a given species divided by two.

DESCRIPTION OF THE STUDY AREA

DHNP is located in Fayette County in southern Illinois (SW/4 Sect. 3, NH Sect. 10, T. 8 N., R. 2 E.) approximately seven miles east of Ramsey (Figure 1). Elevation at DHNP ranges from 154.5 m along Becks Creek to 210 m at the highest point. The preserve is in the Effingham Plain Section of the Southern Till Plain Division (Schwegman et al. 1973). Located on the Illinoian Till Plain, DHNP consists of a 30 ha portion of a kame. Characteristic of a kame, it has a sand and gravel substrate. Topographic features include ravines, valley walls of various slope aspects, and crevasse ridges. A low gradient perennial stream (Becks Creek) occurs within the preserve. Communities present include wet-mesic and mesic floodplain forest, mesic and dry-mesic upland forest, eroding bluffs, and seeps.

RESULTS AND DISCUSSION

Vascular Plant Species Present

Site visits resulted in the collection and identification of 313 species and subspecific taxa within 203 genera and 86 families. Of these taxa, 10 were not native to Illinois. Only one Illinois threatened species, *Carex prasina*, was observed and no Illinois endangered species were found (Herkert 1991).

Ferns, fern allies, and gymnosperms accounted for only 11 taxa, while angiosperms accounted for the remaining 302 taxa. Among the angiosperms, monocots accounted for 73 species in 37 genera and 11 families. Dicots accounted for 229 species in 156 genera and 68 families. The largest genera were *Carex* with 24 species, *Quercus* with 8 species, *Aster* with 5 species, and *Viola* with 5 species. The largest families were Asteraceae (38), Cyperaceae (25), Poaceae (25), and Rosaceae (17). For a complete list of taxa see Appendix 1.

Composition and Structure of Upland Forest Communities

Twenty tree species were encountered in 70 plots with a density of 265 stems/ha and a basal area of 85.87 m²/ha (Table 1). White oak (*Quercus alba*) with an importance value of 36.4 was the dominant tree within the upland forest communities (Table 1). White oak was the most frequently encountered tree in the study area (87.1%) and ranked first in basal area (44.97 m²/ha) and density (99.6 stems/ha). After white oak, the three most important trees were sugar maple (*Acer saccharum*) (IV 14.1), red oak (*Quercus rubra*) (IV 12.7), and black oak (*Quercus velutina*) (IV 9.7) (Table 1).

White oak individuals were most often in the middle size classes (30-39.9, 40-49.9, and 50-59.9 cm) with an average diameter of 43.4 cm (Table 2). Sugar maple individuals fell more into the smaller size classes (10-19.9 and 20-29.9 cm) and had an average diameter

of 25.8 cm. Red oak individuals were fairly evenly distributed over all of the size classes and had an average diameter of 37.2 cm. Large saplings had a density of 740 stems/ha with sugar maple and hop hornbeam having the highest importance values (30.1 and 12.4, respectively) (Table 4). The density for small saplings was 4728.6 stems/ha with sugar maple (1014.3 stems/ha), hop hornbeam (685.7 stems/ha), slippery elm (*Ulmus rubra*) (500.0 stems/ha), and paw paw (*Asimina triloba*) (585.7 stems/ha) having the greatest densities (Table 5). Tree seedlings and shrubs had a density of 25657.1 stems/ha with sugar maple, slippery elm, and sassafras (*Sassafras albidum*) having the greatest densities (3771.4, 3771.4, and 2628.6 stems/ha, respectively) (Table 6).

Composition and Structure by Slope Aspect

East-facing slopes (10 plots)

Fourteen tree species were encountered in plots on east-facing slopes, with a density of 197.5 stems/ha and a basal area of 10.39 m²/ha (Table 3). White oak dominated with an importance value of 33.7, followed by red oak (IV 17.7) and sugar maple (IV 13.6). Densities for red oak and sugar maple were 25.0 stems/ha and 35.0 stems/ha, respectively. Large saplings had a density of 510 stems/ha (Table 4) and small saplings had a density of 8600.0 stems/ha (Table 5), with sugar maple having the greatest density in both categories (390 and 2800 stems/ha, respectively). White oak and red oak were not encountered in the large sapling and small sapling plots. Tree seedlings and shrubs had a density of 23800 stems/ha with sassafras and wild hydrangea (*Hydrangea arborescens*) having the greatest densities (6200 and 3600 stems/ha, respectively) (Table 6). Sugar maple had 1800 stems/ha while white oak and red oak had 1600 and 400 stems/ha, respectively.

West-facing slopes (11 plots)

Fifteen tree species were encountered in plots on west-facing slopes with a density of 275.0 stems/ha and a basal area of 13.09 m²/ha (Table 3). White oak (IV 35.5) and sugar maple (IV 20.3) dominated with Chinquapin oak (*Quercus muehlenbergii*) ranking third (IV 11.6) (Table 3). Large saplings had a density of 709.1 stems/ha with sugar maple having the greatest density (436.4 stems/ha) (Table 4). The density of the small sapling was 4454.5 stems/ha with sugar maple having 1181.8 stems/ha and hop hornbeam having 1000 stems/ha (Table 5). White oak and chinquapin oak were not encountered in the large or small sapling plots. Tree seedlings and shrubs had a density of 27454.5 stems/ha with slippery elm (7454.5 stems/ha) having the greatest density (Table 6). Sugar maple and bladdernut (*Staphylea trifolia*) were also common with 5636.4 and 4363.6 stems/ha, respectively. White oak seedlings had a density of 1090.9 stems/ha while chinquapin oak seedlings were not encountered.

North-facing slopes (3 plots)

Eight tree species were encountered in plots on north-facing slopes with a density of 191.67 stems/ha and a basal area of 2.72 m²/ha (Table 3). Red oak (IV 33.5), sugar maple (IV 19.7) and white oak (IV 16.6) were the dominant taxa. Large saplings had a density of 1033.3 stems/ha with sugar maple having the greatest density (733.3 stems/ha) (Table 4). Small saplings had a density of 6000.0 stems/ha with slippery elm having the

greatest density (1000 stems/ha) (Table 5). Red and white oak were not encountered in the large or small sapling plots. Tree seedlings and shrubs had a density of 28000.0 stems/ha with hydrangea and sassafras having the greatest densities (12666.7 and 4666.7 stems/ha, respectively) (Table 6). Red oak seedlings had a density of 666.7 stems/ha while white oak seedlings were not encountered.

South-facing slopes (1 plot)

Just one plot was located on a south-facing slope. This plot contained 6 tree species with a density of 475.0 stems/ha and a basal area of 1.16 m²/ha (Table 3). White oak (IV 33.5), sugar maple (IV 20.2), and white ash (*Fraxinus americana*) (IV 15.6) were the dominant taxa. Large saplings had a density of 400.0 stems/ha with serviceberry (*Amelanchier arborea*) having the greatest density (200.0 stems/ha) (Table 4). Small saplings had a density of 9000.0 stems/ha with slippery elm having the greatest density (6000.0 stems/ha) (Table 5). White oak and white ash were not encountered in the large or small sapling plots. In the large and small sapling plots, sugar maple had densities of 100.0 stems/ha and 1000.0 stems/ha, respectively. Tree seedlings and shrubs had a density of 32000.0 stems/ha with slippery elm having the greatest density (28000.0 stems/ha) (Table 6).

Ridge (37 plots)

Thirteen tree species were encountered in plots on the ridges with a density of 297.3 stems/ha and a basal area of 52.49 m²/ha (Table 3). White oak was the clear dominant occurring in every plot and having a density of 134.5 stems/ha and an importance value of 41.8 (Table 3). Black oak (*Quercus velutina*) and red oak were the next most important species with densities of 36.5 stems/ha and 38.5 stems/ha and importance values of 14.7 and 12.2, respectively. Large saplings had a density of 813.5 stems/ha with sugar maple having the greatest density (162.2 stems/ha) (Table 4). Eleven large saplings were encountered; white oak ranked tenth with a density of 16.2 stems/ha (Table 4). Small saplings had a density of 3189.2 stems/ha with hop hornbeam and sugar maple having the greatest densities (810.0 and 513.3 stems/ha, respectively) (Table 5). Tree seedlings and shrubs had a density of 26108.1 stems/ha with white oak and sassafras having the greatest densities (4324.3 and 2594.6 stems/ha respectively) (Table 6).

Valley (8 plots)

Thirteen tree species were encountered in the plots in the valleys with a density of 187.5 stems/ha and a basal area of 6.01 m²/ha (Table 3). Sugar maple was the dominant species occurring in every plot and having a density of 96.9 stems/ha and an importance value of 40.3 (Table 3). Large saplings had a density of 662.5 stems/ha, small saplings had a density of 6375.0 stems/ha, and tree seedlings and shrubs had a density of 29000.0 stems/ha (Tables 4, 5, & 6). Sugar maple had the greatest density in the large sapling, small sapling, and tree seedling categories with 350.0, 1181.8, and 12250.0 stems/ha, respectively.

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Table 1. Density, basal area, frequency, relative density, relative dominance, relative frequency, and importance value for each of the tree species encountered at Dean Hills Nature Preserve.

Species	Den. (stems/ha)	Basal area (m ² /ha)	Freq. (%)	Rel. den.	Rel. dom.	Rel. freq.	IV
<i>Quercus alba</i>	99.6	44.97	87.1	37.6	52.4	19.2	36.4
<i>Acer saccharum</i>	43.9	8.87	70.0	16.6	10.3	15.5	14.1
<i>Quercus rubra</i>	31.8	11.50	57.1	12.0	13.4	12.6	12.7
<i>Quercus velutina</i>	21.4	8.57	50.0	8.1	10.0	11.0	9.7
<i>Carya glabra</i>	13.2	3.11	37.1	5.0	3.6	8.2	5.6
<i>Fraxinus americana</i>	13.2	1.77	31.4	5.0	2.1	6.9	4.7
<i>Carya tomentosa</i>	5.7	1.04	18.6	2.2	1.2	4.1	2.5
<i>Quercus muehlenbergii</i>	6.1	1.86	12.9	2.3	2.2	2.8	2.4
<i>Sassafras albidum</i>	6.4	0.38	15.7	2.4	0.4	3.5	2.1
<i>Tilia americana</i>	5.7	1.15	12.9	2.2	1.3	2.8	2.1
<i>Cornus florida</i>	4.6	0.14	15.7	1.8	0.2	3.5	1.8
<i>Carya ovata</i>	3.9	0.62	11.4	1.5	0.7	2.5	1.6
<i>Ostrya virginiana</i>	3.6	0.11	11.4	1.3	0.1	2.5	1.3
<i>Ulmus rubra</i>	1.4	0.28	4.3	0.5	0.3	0.9	0.6
<i>Juglans nigra</i>	1.1	0.37	4.3	0.4	0.4	0.9	0.6
<i>Fraxinus pennsylvanica</i>	1.1	0.12	4.3	0.4	0.1	0.9	0.5
<i>Carya cordiformis</i>	0.7	0.35	2.9	0.3	0.4	0.6	0.4
<i>Populus deltoides</i>	0.4	0.59	1.4	0.1	0.7	0.3	0.4
<i>Ulmus americana</i>	0.7	0.07	2.9	0.3	0.1	0.6	0.3
<i>Aesculus glabra</i>	0.4	0.02	1.4	0.1	0.0	0.3	0.2
Totals	265.0	85.87	452.9	100.0	100.0	100.0	100.0

Table 2. Density (stems/ha) of the tree species encountered at Dean Hills Nature Preserve by diameter class.

Species	Diameter Class (cm)								Ave. diam. (cm)
	10-19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	80+	
<i>Quercus alba</i>	6.4	7.9	22.5	30.7	23.2	8.6	0.4	--	43.4
<i>Acer saccharum</i>	19.6	10.7	7.9	3.6	1.1	0.7	--	0.4	25.8
<i>Quercus rubra</i>	3.9	7.1	8.2	5.0	4.3	1.4	1.8	--	37.2
<i>Quercus velutina</i>	0.7	2.9	9.3	4.3	2.1	1.1	0.7	0.4	40.4
<i>Carya glabra</i>	6.1	3.2	0.4	2.1	1.1	--	--	0.4	26.9
<i>Fraxinus americana</i>	7.5	2.5	2.1	1.1	--	--	--	--	22.3
<i>Carya tomentosa</i>	2.5	0.7	1.8	0.4	0.4	--	--	--	25.6
<i>Quercus muehlenbergii</i>	0.4	1.8	2.5	0.7	0.4	0.4	--	--	35.4
<i>Sassafras albidum</i>	5.4	1.1	--	--	--	--	--	--	15.5
<i>Tilia americana</i>	1.8	2.1	0.7	0.4	0.7	--	--	--	27.4
<i>Cornus florida</i>	4.6	--	--	--	--	--	--	--	11.5
<i>Carya ovata</i>	2.5	--	0.7	0.4	0.4	--	--	--	22.3
<i>Ostrya virginiana</i>	3.6	--	--	--	--	--	--	--	12.0
<i>Ulmus rubra</i>	0.7	0.4	--	--	0.4	--	--	--	29.7
<i>Juglans nigra</i>	--	--	0.4	0.7	--	--	--	--	39.3
<i>Fraxinus pennsylvanica</i>	0.7	--	0.4	--	--	--	--	--	21.0
<i>Carya cordiformis</i>	--	--	--	0.7	--	--	--	--	47.2
<i>Populus deltoides</i>	--	--	--	--	--	--	--	0.4	86.2
<i>Ulmus americana</i>	--	0.4	--	--	--	--	--	--	19.6
<i>Aesculus glabra</i>	0.4	--	--	--	--	--	--	--	14.9
Totals	66.8	40.7	56.8	50.0	33.9	12.1	2.9	1.6	

Table 3. Density, basal area, frequency, relative density, relative dominance, relative frequency, and importance value of the tree species encountered at Dean Hills Nature Preserve arranged by aspect.

East-facing slopes							
Species	Den. (stems/ha)	Basal area (m ² /ha)	Freq. (%)	Rel. den.	Rel. dom.	Rel. freq.	IV
<i>Quercus alba</i>	62.5	5.27	80.0	31.6	50.8	18.6	33.7
<i>Quercus rubra</i>	25.0	2.51	70.0	12.7	24.2	16.3	17.7
<i>Acer saccharum</i>	35.0	0.70	70.0	17.7	6.7	16.3	13.6
<i>Quercus velutina</i>	10.0	0.38	40.0	5.1	3.6	9.3	6.0
<i>Fraxinus americana</i>	15.0	0.34	20.0	7.6	3.3	4.7	5.2
<i>Tilia americana</i>	10.0	0.22	30.0	5.1	2.1	7.0	4.7
<i>Sassafras albidum</i>	12.5	0.12	20.0	6.3	1.2	4.7	4.1
<i>Carya ovata</i>	7.5	0.15	20.0	3.8	1.4	4.7	3.3
<i>Carya tomentosa</i>	5.0	0.21	20.0	2.5	2.0	4.7	3.1
<i>Fraxinus pennsylvanica</i>	5.0	0.04	20.0	2.5	0.4	4.7	2.5
<i>Carya cordiformis</i>	2.5	0.18	10.0	1.3	1.7	2.3	1.8
<i>Carya glabra</i>	2.5	0.18	10.0	1.3	1.7	2.3	1.8
<i>Quercus muehlenbergii</i>	2.5	0.08	10.0	1.3	0.7	2.3	1.4
<i>Cornus florida</i>	2.5	0.01	10.0	1.3	0.1	2.3	1.2
Totals	197.5	10.39	430.0	100.0	100.0	100.0	100.0

Table 3. Continued.

West-facing slopes							
Species	Den. (stems/ha)	Basal area (m ² /ha)	Freq. (%)	Rel. den.	Rel. dom.	Rel. freq.	IV
<i>Quercus alba</i>	95.5	6.70	100.0	34.7	51.2	20.8	35.5
<i>Acer saccharum</i>	77.3	1.59	100.0	28.1	12.1	20.8	20.3
<i>Quercus muehlenbergii</i>	29.5	1.67	54.5	10.7	12.7	11.3	11.6
<i>Quercus rubra</i>	18.2	1.36	45.5	6.6	10.4	9.4	8.8
<i>Fraxinus americana</i>	9.1	0.36	36.4	3.3	2.7	7.5	4.5
<i>Carya glabra</i>	6.8	0.33	27.3	2.5	2.5	5.7	3.6
<i>Ostrya virginiana</i>	9.1	0.05	18.2	3.3	0.4	3.8	2.5
<i>Juglans nigra</i>	4.5	0.23	18.2	1.7	1.8	3.8	2.4
<i>Ulmus rubra</i>	6.8	0.08	18.2	2.5	0.6	3.8	2.3
<i>Carya ovata</i>	4.5	0.13	18.2	1.7	1.0	3.8	2.1
<i>Tilia americana</i>	4.5	0.28	9.1	1.7	2.2	1.9	1.9
<i>Quercus velutina</i>	2.3	0.11	9.1	0.8	0.8	1.9	1.2
<i>Fraxinus pennsylvanica</i>	2.3	0.08	9.1	0.8	0.6	1.9	1.1
<i>Carya tomentosa</i>	2.3	0.07	9.1	0.8	0.6	1.9	1.1
<i>Ulmus americana</i>	2.3	0.05	9.1	0.8	0.4	1.9	1.0
Totals	275.0	13.09	481.8	100.0	100.0	100.0	100.0

Table 3. Continued.

North-facing slopes							
Species	Den. (stems/ha)	Basal area (m ² /ha)	Freq. (%)	Rel. den.	Rel. dom.	Rel. freq.	IV
<i>Quercus rubra</i>	75.00	1.17	66.7	39.1	43.0	18.2	33.5
<i>Acer saccharum</i>	41.67	0.28	100.0	21.7	10.1	27.3	19.7
<i>Quercus alba</i>	25.00	0.75	33.3	13.0	27.6	9.1	16.6
<i>Carya ovata</i>	16.67	0.30	33.3	8.7	11.0	9.1	9.6
<i>Quercus velutina</i>	8.33	0.15	33.3	4.3	5.6	9.1	6.3
<i>Sassafras albidum</i>	8.33	0.05	33.3	4.3	1.7	9.1	5.1
<i>Cornus florida</i>	8.33	0.01	33.3	4.3	0.5	9.1	4.6
<i>Ostrya virginiana</i>	8.33	0.01	33.3	4.3	0.4	9.1	4.6
Totals	191.67	2.72	366.7	100.0	100.0	100.0	100.0

South-facing slopes							
Species	Den. (stems/ha)	Basal area (m ² /ha)	Freq. (%)	Rel. den.	Rel. dom.	Rel. freq.	IV
<i>Quercus alba</i>	150.0	0.61	100.0	31.6	52.3	16.7	33.5
<i>Acer saccharum</i>	125.0	0.20	100.0	26.3	17.6	16.7	20.2
<i>Fraxinus americana</i>	100.0	0.10	100.0	21.1	9.0	16.7	15.6
<i>Quercus muehlenbergii</i>	50.0	0.10	100.0	10.5	8.4	16.7	11.9
<i>Juglans nigra</i>	25.0	0.13	100.0	5.3	11.6	16.7	11.2
<i>Carya tomentosa</i>	25.0	0.01	100.0	5.3	1.2	16.7	7.7
Totals	475.0	1.16	600.0	100.0	100.0	100.0	100.0

Table 3. Continued.

Ridge	Species	Den. (stems/ha)	Basal area (m ² /ha)	Freq. (%)	Rel. den.	Rel. dom.	Rel. freq.	IV
	<i>Quercus alba</i>	134.5	31.01	100.0	45.2	59.1	21.1	41.8
	<i>Quercus velutina</i>	36.5	7.93	78.4	12.3	15.1	16.6	14.7
	<i>Quercus rubra</i>	38.5	5.58	62.2	13.0	10.6	13.1	12.2
	<i>Acer saccharum</i>	23.0	3.66	51.4	7.7	7.0	10.9	8.5
	<i>Carya glabra</i>	20.9	2.29	54.1	7.0	4.4	11.4	7.6
	<i>Fraxinus americana</i>	12.2	0.71	32.4	4.1	1.4	6.9	4.1
	<i>Carya tomentosa</i>	8.1	0.75	24.3	2.7	1.4	5.1	3.1
	<i>Cornus florida</i>	7.4	0.11	24.3	2.5	0.2	5.1	2.6
	<i>Sassafras albidum</i>	7.4	0.19	18.9	2.5	0.4	4.0	2.3
	<i>Ostrya virginiana</i>	2.7	0.04	10.8	0.9	0.1	2.3	1.1
	<i>Carya ovata</i>	2.7	0.05	8.1	0.9	0.1	1.7	0.9
	<i>Tilia americana</i>	2.7	0.15	5.4	0.9	0.3	1.1	0.8
	<i>Quercus muehlenbergii</i>	0.7	0.01	2.7	0.2	0.0	0.6	0.3
Totals		297.3	52.49	473.0	100.0	100.0	100.0	100.0

Table 3. Continued.

Valley	Species	Den. (stems/ha)	Basal area (m ² /ha)	Freq. (%)	Rel. den.	Rel. dom.	Rel. freq.	IV
	<i>Acer saccharum</i>	96.9	2.44	100.0	51.7	40.6	28.6	40.3
	<i>Quercus rubra</i>	15.6	0.88	37.5	8.3	14.6	10.7	11.2
	<i>Tilia americana</i>	18.8	0.48	37.5	10.0	8.1	10.7	9.6
	<i>Quercus alba</i>	12.5	0.63	37.5	6.7	10.4	10.7	9.3
	<i>Fraxinus americana</i>	15.6	0.25	37.5	8.3	4.2	10.7	7.8
	<i>Populus deltoides</i>	3.1	0.59	12.5	1.7	9.8	3.6	5.0
	<i>Carya glabra</i>	6.3	0.31	12.5	3.3	5.2	3.6	4.0
	<i>Ulmus rubra</i>	3.1	0.20	12.5	1.7	3.3	3.6	2.8
	<i>Carya cordiformis</i>	3.1	0.17	12.5	1.7	2.8	3.6	2.7
	<i>Sassafras albidum</i>	3.1	0.02	12.5	1.7	0.3	3.6	1.9
	<i>Asculus glabra</i>	3.1	0.02	12.5	1.7	0.3	3.6	1.8
	<i>Ulmus americana</i>	3.1	0.01	12.5	1.7	0.2	3.6	1.8
	<i>Ostrya virginiana</i>	3.1	0.01	12.5	1.7	0.2	3.6	1.8
	Totals	187.5	6.01	350.0	100.0	100.0	100.0	100.0

Table 4. Density arranged by aspect, total density, relative density, frequency, relative frequency, and importance value for large saplings encountered at Dean Hills Nature Preserve.

Species	Aspects						All Plots				
	East	West	North	South	Ridge	Valley	Den. (stems/ha)	Rel. den.	Freq. (%)	Rel. freq.	IV
<i>Acer saccharum</i>	390.0	436.4	733.3	100.0	162.2	350.0	282.9	38.2	65.7	22.0	30.1
<i>Ostrya virginiana</i>	20.0	81.8	66.7	--	110.8	37.5	81.4	11.0	41.4	13.9	12.4
<i>Carya glabra</i>	20.0	--	--	--	145.9	--	80.0	10.8	28.6	9.6	10.2
<i>Cornus florida</i>	20.0	36.4	100.0	--	100.0	--	65.7	8.9	34.3	11.5	10.2
<i>Carya ovata</i>	--	27.3	--	--	91.9	12.5	54.3	7.3	22.9	7.7	7.5
<i>Amelanchier arborea</i>	--	45.5	--	200.0	48.6	--	35.7	4.8	18.6	6.2	5.5
<i>Sassafras albidum</i>	10.0	9.1	33.3	--	59.5	--	35.7	4.8	15.7	5.3	5.0
<i>Carya tomentosa</i>	--	9.1	--	--	32.4	12.5	20.0	2.7	15.7	5.3	4.0
<i>Quercus rubra</i>	--	18.2	--	--	32.4	--	20.0	2.7	14.3	4.8	3.7
<i>Tilia americana</i>	30.0	18.2	100.0	--	--	25.0	14.3	1.9	12.9	4.3	3.1
<i>Fraxinus americana</i>	--	9.1	--	--	13.5	--	8.6	1.2	5.7	1.9	1.5
<i>Quercus alba</i>	--	--	--	--	16.2	--	8.6	1.2	5.7	1.9	1.5
<i>Asimina triloba</i>	--	--	--	--	--	87.5	10.0	1.4	2.9	1.0	1.2
<i>Asculus glabra</i>	10.0	9.1	--	--	--	--	2.9	0.4	2.9	1.0	0.7
<i>Celtis occidentalis</i>	10.0	--	--	100.0	--	--	2.9	0.4	2.9	1.0	0.7
<i>Ulmus americana</i>	--	--	--	--	--	62.5	7.1	1.0	1.4	0.5	0.7
<i>Lindera benzoin</i>	--	--	--	--	--	37.5	4.3	0.6	1.4	0.5	0.5
<i>Carya cordiformis</i>	--	--	--	--	--	12.5	1.4	0.2	1.4	0.5	0.3
<i>Gymnocladium dioica</i>	--	--	--	--	--	12.5	1.4	0.2	1.4	0.5	0.3
<i>Morus rubra</i>	--	--	--	--	--	12.5	1.4	0.2	1.4	0.5	0.3
<i>Ulmus rubra</i>	--	9.1	--	--	--	--	1.4	0.2	1.4	0.5	0.3
Totals	510.0	709.1	1033.3	400.0	813.5	662.5	740.0	100.0	298.6	100.0	100.0

Table 5. Density arranged by aspect, total density, relative density, frequency, relative frequency, and importance value for small saplings encountered at Dean Hills Nature Preserve.

Species	Aspect					All Plots					
	East	West	North	South	Valley	Den. (stems/ha)	Rel. den. (%)	Freq.	Rel. freq.	IV	
<i>Acer saccharum</i>	2800.0	1181.8	666.7	1000.0	513.3	1181.8	1014.3	21.5	37.1	17.4	19.4
<i>Ostrya virginiana</i>	300.0	1000.0	333.3	--	810.8	1000.0	685.7	14.5	35.7	16.8	15.6
<i>Ulmus rubra</i>	600.0	181.8	1000.0	6000.0	162.2	181.8	500.0	10.6	20.0	9.4	10.0
<i>Asimina triloba</i>	1800.0	181.8	--	--	--	181.8	585.7	12.4	11.4	5.4	8.9
<i>Carya glabra</i>	200.0	272.7	--	--	486.5	272.7	328.6	6.9	22.9	10.7	8.8
<i>Cornus florida</i>	600.0	363.6	--	--	216.2	363.6	257.1	5.4	17.1	8.1	6.7
<i>Staphylea trifolia</i>	1400.0	272.7	3333.3	--	--	272.7	400.0	8.5	5.7	2.7	5.6
<i>Carya ovata</i>	--	90.9	--	--	378.4	90.9	214.3	4.5	11.4	5.4	5.0
<i>Sassafras albidum</i>	300.0	--	--	--	270.3	--	185.7	3.9	11.4	5.4	4.6
<i>Fraxinus americana</i>	--	90.9	--	--	108.1	90.9	100.0	2.1	8.6	4.0	3.1
<i>Amelanchier arborea</i>	--	545.5	--	--	81.1	545.5	128.6	2.7	7.1	3.4	3.0
<i>Crataegus pruinosa</i>	--	--	--	--	81.1	--	42.9	0.9	4.3	2.0	1.5
<i>Tilia americana</i>	100.0	--	666.7	--	--	--	42.9	0.9	2.9	1.3	1.1
<i>Ulmus americana</i>	300.0	--	--	--	--	--	42.9	0.9	2.9	1.3	1.1
<i>Quercus alba</i>	--	--	--	--	54.1	--	28.6	0.6	2.9	1.3	1.0
<i>Lindera benzoin</i>	--	--	--	--	--	--	57.1	1.2	1.4	0.7	0.9
<i>Carya tomentosa</i>	--	--	--	--	27.0	--	14.3	0.3	1.4	0.7	0.5
<i>Celtis occidentalis</i>	100.0	--	--	--	--	--	14.3	0.3	1.4	0.7	0.5
<i>Cercis canadensis</i>	--	--	--	1000.0	--	--	14.3	0.3	1.4	0.7	0.5
<i>Cornus drummondii</i>	--	--	--	1000.0	--	--	14.3	0.3	1.4	0.7	0.5
<i>Juniperus virginiana</i>	--	90.9	--	--	--	90.9	14.3	0.3	1.4	0.7	0.5
<i>Prunus serotina</i>	100.0	--	--	--	--	--	14.3	0.3	1.4	0.7	0.5
<i>Hydrangea arborescens</i>	--	181.8	--	--	--	181.8	28.6	0.6	1.4	0.7	0.6
Totals	8600.0	4454.5	6000.0	9000.0	3189.2	6375.0	4728.6	100.0	212.9	100.0	100.0

Table 6. Density arranged by aspect, total density, relative density, frequency, and importance value for tree seedlings and shrubs encountered at Dean Hills Nature Preserve.

Species	Aspect						All Plots				
	East	West	North	South	Ridge	Valley	Den. (stems/ha)	Rel. den.	Freq. (%)	Rel. freq.	IV
<i>Acer saccharum</i>	1800.0	5636.4	2666.7	--	2108.1	12250.0	3771.4	14.7	12.6	11.7	13.2
<i>Ulmus rubra</i>	1800.0	7454.5	1333.3	28000.0	378.4	750	3771.4	14.7	7.4	6.9	10.8
<i>Sassafras albidum</i>	6200.0	--	4666.7	--	2594.6	--	2628.6	10.2	8.9	8.3	9.3
<i>Quercus alba</i>	1600.0	1090.9	--	--	4324.3	500.0	1971.4	7.7	8.3	7.7	7.7
<i>Carya glabra</i>	800.0	--	--	--	2000.0	1250.0	1314.3	5.1	8.9	8.3	6.7
<i>Hydrangea arborescens</i>	3600.0	545.5	12666.7	--	756.8	2750.0	1857.1	7.2	4.9	4.5	5.9
<i>Ostrya virginiana</i>	--	2781.8	1333.3	--	1729.7	250.0	1342.9	5.2	6.6	6.1	5.7
<i>Cornus florida</i>	1200.0	545.5	--	--	1675.7	250.0	1171.4	4.6	6.0	5.6	5.1
<i>Fraxinus americana</i>	600.0	1090.9	--	--	1297.3	250.0	971.4	3.8	5.4	5.1	4.4
<i>Quercus velutina</i>	1000.0	--	--	--	1189.1	500.0	828.6	3.2	5.4	5.1	4.1
<i>Prunus serotina</i>	400.0	181.8	--	--	973.0	250.0	628.6	2.4	5.1	4.8	3.6
<i>Toxicodendron radicans</i>	400.0	909.1	2000.0	4000.0	432.4	3000.0	914.3	3.6	4.0	3.7	3.6
<i>Amelanchier arborea</i>	--	727.3	--	--	1351.4	--	828.6	3.2	3.1	2.9	3.1
<i>Staphylea trifolia</i>	1200.0	4363.6	1333.3	--	--	1000.0	1028.6	4.0	2.0	1.9	2.9
<i>Carya ovata</i>	--	--	--	--	648.6	500.0	428.6	1.7	3.4	3.2	2.4
<i>Quercus rubra</i>	400.0	181.8	666.7	--	486.5	250.0	400.0	1.6	3.4	3.2	2.4
<i>Asimina triloba</i>	400.0	909.1	--	--	--	1500.0	371.4	1.4	1.7	1.6	1.5
<i>Ulmus americana</i>	1200.0	--	--	--	108.1	750.0	314.3	1.2	2.0	1.9	1.5
<i>Cercis canadensis</i>	--	181.8	--	--	324.3	--	200.0	0.8	2.0	1.9	1.3
<i>Carya tomentosa</i>	--	181.8	--	--	432.4	--	228.6	0.9	1.7	1.6	1.2
<i>Acer negundo</i>	--	--	--	--	--	1000.0	114.3	0.4	0.3	0.3	0.4
<i>Carya cordiformis</i>	--	181.8	--	--	--	250.0	57.1	0.2	0.6	0.5	0.4

Table continued on next page.

Table 6. Continued.

Species	Aspect						All Plots				
	East	West	Diameter (stems/ha)		Ridge	Valley	Den. (stems/ha)	Rel. den.	Freq. (%)	Rel. freq.	IV
			North	South							
<i>Crataegus pruinosa</i>	200.0	--	--	--	108.1	--	85.7	0.3	0.6	0.5	0.4
<i>Lindera benzoin</i>	--	--	--	--	--	1250.0	142.9	0.6	0.3	0.3	0.4
<i>Morus rubra</i>	200.0	--	--	--	54.1	--	57.1	0.2	0.6	0.5	0.4
<i>Tilia americana</i>	200.0	--	666.7	--	--	--	57.1	0.2	0.6	0.5	0.4
<i>Carpinus caroliniana</i>	400.0	--	--	--	--	--	57.1	0.2	0.3	0.3	0.2
<i>Celtis occidentalis</i>	200.0	--	--	--	--	--	28.6	0.1	0.3	0.3	0.2
<i>Euonymus atropurpurea</i>	--	--	--	--	--	250.0	28.6	0.1	0.3	0.3	0.2
<i>Quercus muehlenbergii</i>	--	--	666.7	--	--	--	28.6	0.1	0.3	0.3	0.2
<i>Sambucus canadensis</i>	--	--	--	--	--	250.0	28.6	0.1	0.3	0.3	0.2
Totals	23800.0	27454.55	28000.0	32000.0	26108.1	29000.0	25657.1	100.0	107.1	100.0	100.0

**Appendix 1: Vouchered Species List for
Dean Hills Nature Preserve Fayette County, Illinois**

The vascular taxa encountered at the Dean Hills Nature Preserve are listed below by major groups, Pteridophytes (fern and fern-allies) and Spermatophytes (flowering plants), the latter divided into Monocots and Dicots. The families, genera, and species are alphabetically arranged within each group. Taxa that are introduced in Illinois are indicated by an asterisk (*). Collecting numbers are those of Feist (MAF) and Busemeyer (DTB).

Pteridophyta

Adiantaceae

Adiantum pedatum (Tourn.) L.; DTB 175

Aspleniaceae

Asplenium platyneuron (L.) Oakes ex D.C. Eaton; MAF 530

Cystopteris fragilis (L.) Bernh. var. *protrusa* Weatherby; MAF 526, DTB 157

Polystichum acrostichoides (Michaux) Schott; MAF 341

Dryopteridaceae

Athyrium filix-femina (L.) Mertens var. *angustum* (Willd.) Presl.; MAF 784

Equisetaceae

Equisetum hyemale L. var. *affine* (Engelm.) A.A. Eaton; MAF 785

Ophioglossaceae

Botrychium dissectum Spreng.; MAF 783, DTB 286

Botrychium virginianum (L.) Swartz; MAF 325

Ophioglossum vulgatum L.; MAF 939

Thelypteridaceae

Phegopteris hexagonoptera (Michaux) Fee; DTB 203

Spermatophyta: Gymnospermae

Cupressaceae

Juniperus virginiana L.; MAF 931

Spermatophyta: Angiospermae

Monocots

Alismataceae

Alisma plantago-aquatica L. var. *parviflorum* (Pursh) Torrey; DTB 324

Araceae*Arisaema dracontium* (L.) Schott; DTB 158*Arisaema triphyllum* (L.) Schott; DTB 11**Commelinaceae***Tradescantia subaspera* Ker; MAF 542 , DTB 184*Tradescantia virginiana* L.; MAF 346**Cyperaceae***Carex albicans* Willd. ex Spreng. var. *albicans*; MAF 348, DTB 21 ,*Carex albursina* Sheldon; MAF 350*Carex blanda* Dewey; MAF 336 , DTB 26*Carex bushii* Mackenzie; MAF 368 , MAF 548 , DTB 205*Carex cephalophora* Muhl.; MAF 347 , MAF 547 , MAF 549*Carex conjuncta* Boott; DTB 553*Carex davisii* Schwein. & Torrey; DTB 542*Carex digitalis* Willd.; MAF 345*Carex glaucoidea* Tuckerman ex Olney; MAF 359*Carex grayi* Carey; DTB 560*Carex grisea* Wahl.; MAF 335, DTB 551*Carex hirsutella* Mackenzie; MAF 927*Carex hirtifolia* Mackenzie; MAF 342*Carex jamesii* Schweinitz; MAF 330, DTB 549*Carex molesta* Mackenzie ex Bright; DTB 562*Carex muhlenbergii* Schkuhr ex Willd.; MAF 360, DTB 192*Carex pennsylvanica* Lam.; DTB 27*Carex retroflexa* Muhl. ex Willd.; MAF 369*Carex rosea* Schkuhr ex Willd.; MAF 361*Carex shortiana* Dewey; DTB 543*Carex sparganioides* Muhl. ex Willd.; MAF 354 , MAF 539*Carex umbellata* Schkuhr ex Willd.; DTB 28*Carex vulpinoidea* Michaux; DTB 552*Cyperus strigosus* L.; DTB 270*Eleocharis obtusa* (Willd.) Schult. var. *detonsa* (Gray) Drap. & Mohlenbr.; DTB 298**Dioscoreaceae***Dioscorea quarternata* Walt. J.F. Gemel.; MAF 926B**Iridaceae***Iris brevicaulis* Raf.; DTB 537*Sisyrinchium angustifolium* Mill.; DTB 575**Juncaceae***Juncus acuminatus* Michaux; DTB 310, DTB 548*Juncus marginatus* Rostk.; DTB 330*Juncus tenuis* Willd.; DTB 296

Liliaceae

- Allium canadense* L.; MAF 343
Allium vineale L.; DTB 540
Erythronium albidum Nutt.; MAF 226, DTB 17
Hypoxis hirsuta (L.) Coville; MAF 372
Polygonatum biflorum (Walt.) A. Dietr.; MAF 334
Smilacina racemosa (L.) Desf.; MAF 340
Trillium recurvatum Beck.; DTB 2
Uvularia grandiflora J.E. Smith; MAF 234

Orchidaceae

- Aplectrum hyemale* (Willd.) Nutt.; MAF 218
Galearis spectabilis (L.) Raf.; MAF 926A
Liparis liliifolia L.C. Rich. ex Ker Gawl.; MAF 379

Poaceae

- Agrostis gigantea* Roth; DTB 295
Agrostis perennans (Walter) Tuckerman; MAF 587
Brachyelytrum erectum (Schreb.) Beauv.; MAF 607, DTB 186
Bromus pubescens Muhl.; DTB 190
Cinna arundinaceae L.; MAF 590
Danthonia spicata (L.) Beauv. ex Roem. & J.A. Schultes; DTB 204
Diarrhena americana P. Beauv. var. *obovata* Gleason; DTB 319
**Echinochloa crus-galli* (L.) Beauv.; DTB 331
Elymus sp.; DTB 164
Elymus virginicus L.; MAF 528
Elymus virginicus L. var. *glabriflorus* (Vasey) Bush; DTB 557
Elymus hystrix L.; DTB 196
Festuca obtusa Biehler; MAF 328 , DTB 155
Glyceria striata (Lam.) Hitchcock; DTB 561
Leersia virginica Willd.; MAF 594
Muhlenbergia sobolifera (Muhl.) Trin.; MAF 603
Muhlenbergia tenuiflora (Willd.) BSP; MAF 525
Panicum boscii Poir.; DTB 199
Panicum lanuginosum Ell. var. *fasciculatum* (Torrey) Fern.; MAF 531 , DTB 173
Panicum linearifolium Scribn. var. *linearifolium*; MAF 376 , DTB 202
Panicum villosissimum Nash.; MAF 778
Poa annua L.; DTB 547
Poa sylvestris A. Gray; MAF 338
**Setaria faberi* R. Herrm.; DTB 282
Sphenopholus obtusata (Michaux) Scribn. var. *obtusata*; MAF 349

Smilacaceae

- Smilax hispida* Muhl.; MAF 352 , MAF 582 , MAF 591 , DTB 322

Dicots

Aceraceae

- Acer negundo* L.; DTB 181
Acer saccharinum L.; MAF 788 , DTB 315, DTB 574
Acer saccharum Marsh.; MAF 351

Anacardiaceae

- Toxicodendron radicans* (L.) Kuntze.; DTB 206

Annonaceae

- Asimina triloba* (L.) Dunal; DTB 25 , MAF 598

Apiaceae

- Chaerophyllum procumbens* (L.) Crantz; DTB 23
Cryptotaenia canadensis (L.) DC.; DTB 160
Osmorhiza claytonii (Michaux) Clarke; MAF 353
Osmorhiza longistylis (Torrey) DC.; MAF 332
Sanicula canadensis L.; DTB 156
Sanicula gregaria Bickn.; MAF 324
Taenidia integerrima (L.) Drude; MAF 375
Zizia aurea (L.) Koch; DTB 563

Apocynaceae

- Apocynum androsaemifolium* L.; MAF 930

Araliaceae

- Aralia racemosa* L.; MAF 533
Panax quinquefolius L.; MAF 529, MAF 937

Aristolochiaceae

- Aristolochia serpentaria* L.; DTB 191
Asarum canadense L.; DTB 3

Asclepiadaceae

- Asclepias exaltata* L.; MAF 380

Asteraceae

- **Achillea millifolium* L.; DTB 291, 539
Ambrosia artemisiifolia L.; DTB 278
Ambrosia trifida L.; DTB 267
Antennaria plantaginifolia (L.) Richardson; MAF 231
Aster lanceolatus Muhl. var. *simplex* (Willd.) A.G. Jones; MAF 792
Aster cordifolius L.; MAF 769
Aster ontarionus Wieg.; MAF 791
Aster shortii Lindl.; MAF 773

Aster turbinellus Lindl.; MAF 776
Bidens frondosa L.; MAF 593
Cacalia muhlenbergii (Sch. Bip.) Fern.; DTB 167
Conyza canadensis (L.) Cronq.; DTB 272
Eclipta prostrata (L.) L.; DTB 323
Erechtites hieracifolia (L.) Raf.; MAF 780 , DTB 303
Erigeron annuus L. (Pers.); DTB 176 , DTB 201
Erigeron philadelphicus L.; MAF 329
Erigeron pulchellus Michaux; MAF 381
Eupatorium perfoliatum L.; DTB 308
Eupatorium purpureum L.; MAF 600
Eupatorium rugosum Houtt.; MAF 601 , MAF 602
Eupatorium serotinum Michaux; DTB 281
Euthamia graminifolia (L.) Nutt .; DTB 283
Gnaphalium obtusifolium L.; DTB 279
Hieracium scabrum Michaux; MAF 586 , MAF 781
Lactuca floridana (L.) Gaertner; MAF 588 , DTB 294
Liatris aspera Michaux; MAF 779
Krigia biflora (Walt.) Blake; MAF 371
Krigia dandelion (L.) Nutt.; MAF 374
Prenanthes crepidinea Michaux; DTB 576
Rudbeckia laciniata L.; DTB 266
Rudbeckia triloba L.; MAF 596 , DTB 265
Senecio glabellus Poiret; MAF 337
Solidago canadensis L.; DTB 302
Solidago gigantea Aiton; DTB 280
Solidago nemoralis Aiton; MAF 777
Solidago ulmifolia Muhl.; MAF 584
**Taraxacum officinale* G.H. Weber ex Wiggers; DTB 22
Verbesina alternifolia (L.) Britton; DTB 264

Balsaminaceae

Impatiens capensis Meerb.; DTB 166
Impatiens pallida Nutt.; DTB 165

Berberidaceae

Podophyllum peltatum L.; MAF 331

Betulaceae

Betula nigra L.; DTB 318, DTB 570
Carpinus caroliniana Walter; MAF 228
Ostrya virginiana (P. Mill.) K. Koch; MAF 585

Bignoniaceae

Campsis radicans (L.) Seemann.; DTB 260

Boraginaceae

- Mertensia virginica* (L.) Pers.; MAF 227
Myosotis verna Nutt.; MAF 377, DTB 566

Brassicaceae

- Arabis canadensis* L.; MAF 933
Arabis laevigata (Muhl.) Poiret; DTB 6
Arabis shortii (Fern.) Gleason; DTB 14
Cardamine concatenata (Michaux) O. Schwarz; MAF 222
Draba verna L.; MAF 217
Iodanthus pinnatifidus (Michaux) Steudal; MAF 344
Rorippa sessiliflora (Nutt.) Hitchcock; DTB 300

Caesalpiaceae

- Cercis canadensis* L.; MAF 235
Gymnocladus dioicus (L.) K. Koch; DTB 163

Callitrichaceae

- Callitriche terrestris* Raf.; MAF 382

Campanulaceae

- Campanula americana* L.; MAF 532
Lobelia inflata L.; DTB 268
Lobelia siphilitica L.; DTB 287
Triodanis perfoliata (L.) Nieuwl.; MAF 365

Caprifoliaceae

- Sambucus canadensis* L.; DTB 327

Caryophyllaceae

- Cerastium nutans* Raf.; MAF 378
Silene stellata (L.) Aiton f.; MAF 543

Celastraceae

- Celastrus scandens* L.; MAF 936
Euonymus atropurpurea Jacq.; DTB 259, DTB 564

Clusiaceae

- Hypericum mutilum* L.; DTB 273
Hypericum punctatum Lam.; MAF 589, DTB 269

Convolvulaceae

- **Ipomoea hederacea* (L.) Jacq.; DTB 274
Ipomoea lacunosa L.; DTB 275
Ipomoea pandurata (L.) G.F.W. Meyer; DTB 289

Cornaceae*Cornus drummondii* C.A. Meyer; DTB 178, DTB 571*Cornus florida* L.; DTB 20**Corylaceae***Corylus americana* Walt.; MAF 768**Euphorbiaceae***Acalypha rhomboidea* Raf.; DTB 290*Acalypha virginica* L.; DTB 271*Chamaesyce supina* (Raf.) Moldenke; DTB 312**Fabaceae***Amorpha fruticosa* L. var. *angustifolia* Pursh; DTB 311*Amphicarpaea bracteata* (L.) Fern.; DTB 285*Desmodium nudiflorum* (L.) DC.; MAF 522*Desmodium glabellum* (Michaux) DC.; DTB 284*Desmodium glutinosum* (Muhl.) Wood; MAF 770, DTB 193**Trifolium pratense* L.; DTB 292**Trifolium repens* L.; DTB 545**Fagaceae***Quercus alba* L.; DTB 188*Quercus imbricaria* Michaux.; DTB 317, DTB 546*Quercus x leana* Nutt. (*Quercus imbricaria* x *velutina*); DTB 306*Quercus macrocarpa* Michaux; DTB 169, DTB 307*Quercus muhlenbergii* Engelm.; DTB 305*Quercus palustris* Muenchh.; DTB 316, DTB 565*Quercus rubra* L.; MAF 537, DTB 168*Quercus velutina* Lam.; MAF 599, MAF 774**Fumariaceae***Dicentra cucullaria* (L.) Bernh.; MAF 219**Gentianaceae***Frasera caroliniensis* Walt.; MAF 938**Geraniaceae***Geranium carolinianum* L.; DTB 567*Geranium maculatum* L.; DTB 12**Hippocastanaceae***Aesculus glabra* Willd.; MAF 356, DTB 9, DTB 257**Hydrangeaceae***Hydrangea arborescens* L.; DTB 171

Hydrophyllaceae

- Ellisia nyctelea* L.; MAF 355
Hydrophyllum appendiculatum Michaux; MAF 327
Hydrophyllum canadense L.; DTB 177
Hydrophyllum macrophyllum Nutt.; MAF 333, DTB 13

Juglandaceae

- Carya cordiformis* (Wangenh.) K. Koch.; MAF 772, DTB 314, DTB 555-
Carya glabra (Mill.) Sweet; MAF 767
Carya tomentosa (Lam. ex Poiret) Nutt.; DTB 189
Juglans nigra L.; DTB 261, DTB 569, DTB 572

Lamiaceae

- Blephilia ciliata* (L.) Benth.; MAF 934, DTB 538
Cunila origanoides (L.) Britt.; MAF 606
 **Glechoma hederacea* L.; DTB 182
Lycopus americanus Muhl.; DTB 309
Lycopus virginicus L.; MAF 597
Monarda bradburiana Beck; MAF 358
Monarda clinopodia L.; MAF 540
 **Prunella vulgaris* L.; MAF 545
Scutellaria incana Biehler; MAF 544
Scutellaria ovata Hill; MAF 534
Scutellaria ovata Hill var. *versicolor* Nutt.; DTB 185

Lauraceae

- Lindera benzoin* (L.) Blume; MAF 224
Sassafras albidum (Nutt.) Nees.; DTB 32 , DTB 288

Lythraceae

- Ammannia coccinea* Rottb.; DTB 297

Malvaceae

- Sida spinosa* L.; DTB 293

Menispermaceae

- Menispermum canadense* L.; DTB 320

Moraceae

- Humulus lupulus* L.; MAF 789
Morus rubra L.; DTB 187

Oleaceae

- Fraxinus americana* L.; DTB 162 , DTB 321

Onagraceae

Circaea lutetiana ssp. *canadensis* (L.) Aschers. & Magnus; DTB 161

Oxalidaceae

Oxalis stricta L.; MAF 524

Oxalis violacea L.; MAF 363

Papaveraceae

Sanguinaria canadensis L.; MAF 220

Passifloraceae

Passiflora lutea L. var. *glabriflora* Fern.; MAF 775

Phytolaccaceae

Phytolacca americana L.; DTB 200

Platanaceae

Platanus occidentalis L.; DTB 159

Polemoniaceae

Phlox divaricata L. ssp. *laphamii* (Wood) Wherry; DTB 5

Phlox paniculata L.; MAF 605 , DTB 263

Polemonium reptans L.; DTB 18

Polygonaceae

Polygonum pensylvanicum L.; DTB 277

Polygonum punctatum Ell.; MAF 592 , DTB 326

Polygonum scandens L.; DTB 262

Polygonum virginianum L.; DTB 332

Rumex altissimus Wood; DTB 559

**Rumex crispus* L.; DTB 544

Portulacaceae

Claytonia virginica L.; MAF 221

Primulaceae

Dodecatheon meadia L.; DTB 4

Samolus valerandii L.; DTB 329

Pyrolaceae

Monotropa uniflora L.; MAF 771

Ranunculaceae

- Actaea pachypoda* Ell.; MAF 538
Anemone virginiana L.; MAF 546
Delphinium tricornis Michaux; DTB 19
Hepatica nobilis P. Mill var. *acuta* (Pursh) Steyermark; MAF 230
Isopyrum biternatum (Raf.) Torrey & Gray; MAF 223
Myosurus minimus L.; DTB 24
Ranunculus hispidus Michaux; DTB 15
Ranunculus recurvatus Poiret; MAF 367
Thalictrum dioicum L.; DTB 7

Rosaceae

- Agrimonia pubescens* Wallr.; MAF 766
Agrimonia rostellata Wallr.; MAF 535, MAF 604
Amelanchier arborea (Michaux f.) Fern.; MAF 232
Crataegus mollis (Torrey & Gray) Scheele; MAF 929
Geum canadense Jacq.; MAF 536
Geum vernum (Raf.) Torrey & Gray; DTB 31
Porteranthus stipulatus (Muhl.) Britton; DTB 195
Potentilla norvegica L.; DTB 276
Potentilla simplex Michaux; MAF 362
Prunus serotina Ehrh.; DTB 313, DTB 554
Rosa blanda Aiton; DTB 198
Rosa carolina L.; MAF 935
 **Rosa multiflora* Thunb.; MAF 790
Rubus allegheniensis Porter; DTB 172
Rubus flagellaris Willd.; DTB 550
Rubus occidentalis L.; DTB 174
Rubus pensilvanicus Poiret; MAF 940

Rubiaceae

- Cephalanthus occidentalis* L.; DTB 558
Galium aparine L.; MAF 326
Galium circaezans Michaux; DTB 194
Galium concinnum Torrey & Gray; MAF 521, DTB 170
Galium triflorum Michaux; MAF 520
Hedyotis purpurea (L.) Torrey & Gray; MAF 373

Salicaceae

- Populus deltoides* Marsh.; DTB 180

Saxifragaceae

- Heuchera americana* L. var. *hirsuticaulis* (Wheelock) Rosendahl, Butters, & Lakela;
 MAF 370

Scrophulariaceae

- Aureolaria grandiflora* (Benth.) Pennell var. *pulchra* Pennell; MAF 583
Collinsia verna Nutt.; DTB 8
Gratiola neglecta Torrey; DTB 301
Leucospora multifida (Michaux) Nutt.; DTB 298
Lindernia dubia (L.) Pennell; DTB 325
Mimulus alatus Aiton; MAF 595
Penstemon digitalis Nuttall; DTB 541
Penstemon hirsutus (L.) Willd.; MAF 364
Scrophularia marilandica L.; MAF 581
 **Veronica arvensis* L.; DTB 568

Solanaceae

- Solanum ptycanthum* Dunal; DTB 328

Staphyleaceae

- Staphylea trifolia* L.; DTB 10

Tiliaceae

- Tilia americana* L.; DTB 179

Ulmaceae

- Celtis occidentalis* L.; DTB 258, DTB 556
Ulmus americana L.; MAF 233
Ulmus rubra Muhl.; MAF 229

Urticaceae

- Laportea canadensis* (L.) Wedd.; MAF 541
Parietaria pensylvanica Muhl.; MAF 357
Pilea pumila (L.) Gray; MAF 786

Verbenaceae

- Phryma leptostachya* L.; MAF 527

Violaceae

- Hybanthus concolor* Jacq.; MAF 339
Viola pedata L.; DTB 29
Viola pubescens Aiton var. *pubescens*; DTB 1
Viola sororia Willd.; MAF 225
Viola striata Aiton; DTB 16
Viola triloba Schwein.; DTB 30

Vitaceae

- Parthenocissus quinquefolia* (L.) Planch.; DTB 573
Vitis aestivalis Michaux; DTB 197

Vitis cinerea Engelm.; DTB 183

Vitis riparia Michaux; MAF 787 , DTB 304