Floristic Survey of Dean Hills Nature Preserve
Fayette County, Illinois

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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 m^2/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 m^2/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 m^2/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 stem/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 m^2/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 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 m^2/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 m^2/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 m^2/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 m^2/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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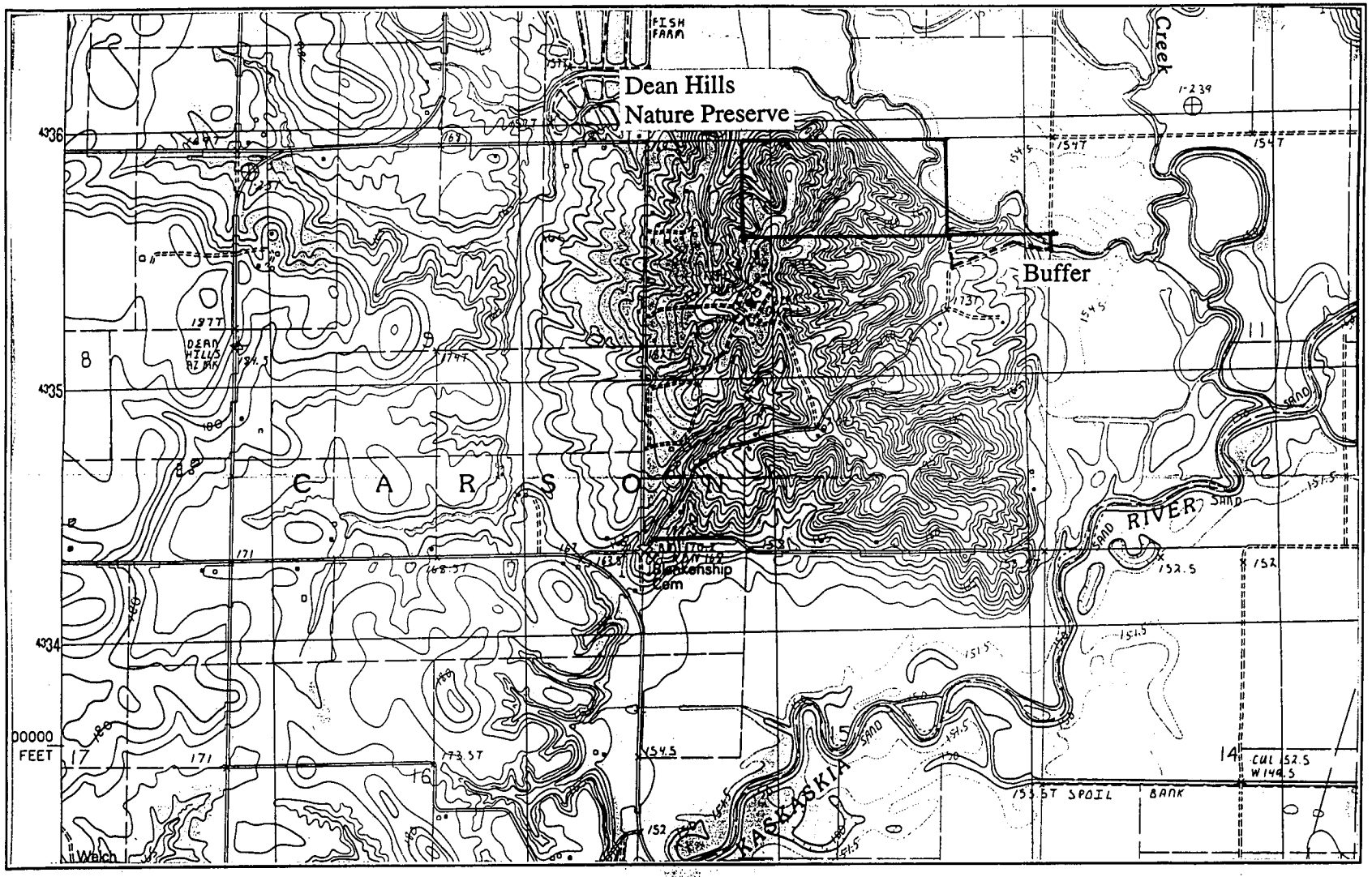

Figure 1. Location of Dean Hills Nature Preserve on the Herrick, Illinois 7.5 minute topographic quadrangle (SW/4 Sect. 3, NH Sect. 10, T. 8 N., R. 2 E.).

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

	Diameter Class (cm)								
Species	**10-19.9**	**20-29.9**	**30-39.9**	**40-49.9**	**50-59.9**	**60-69.9**	**70-79.9**	**80+**	**Ave. diam. (cm)**
Quercus alba	6.4	7.9	22.5	30.7	23.2	8.6	0.4	--	43.4
Acer saccharum	19.6	10.7	7.9	3.6	1.1	0.7	--	0.4	25.8
Quercus rubra	3.9	7.1	8.2	5.0	4.3	1.4	1.8	--	37.2
Quercus velutina	0.7	2.9	9.3	4.3	2.1	1.1	0.7	0.4	40.4
Carya glabra	6.1	3.2	0.4	2.1	1.1	--	--	0.4	26.9
Fraxinus americana	7.5	2.5	2.1	1.1	--	--	--	--	22.3
Carya tomentosa	2.5	0.7	1.8	0.4	0.4	--	--	--	25.6
Quercus muehlenbergii	0.4	1.8	2.5	0.7	0.4	0.4	--	--	35.4
Sasafras albidum	5.4	1.1	--	--	--	--	--	--	15.5
Tilia americana	1.8	2.1	0.7	0.4	0.7	--	--	--	27.4
Cornus florida	4.6	--	--	--	--	--	--	--	11.5
Carya ovata	2.5	--	0.7	0.4	0.4	--	--	--	22.3
Ostrya virginiana	3.6	--	--	--	--	--	--	--	12.0
Ulmus rubra	0.7	0.4	--	--	0.4	--	--	--	29.7
Juglans nigra	--	--	0.4	0.7	--	--	--	--	39.3
Fraxinus pennsylvanica	0.7	--	0.4	--	--	--	--	--	21.0
Carya cordiformis	--	--	--	0.7	--	--	--	--	47.2
Populus deltoides	--	--	--	--	--	--	--	0.4	86.2
Ulmus americana	--	0.4	--	--	--	--	--	--	19.6
Aesculus glabra	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
Quercus alba	62.5	5.27	80.0	31.6	50.8	18.6	33.7
Quercus rubra	25.0	2.51	70.0	12.7	24.2	16.3	17.7
Acer saccharum	35.0	0.70	70.0	17.7	6.7	16.3	13.6
Quercus velutina	10.0	0.38	40.0	5.1	3.6	9.3	6.0
Fraxinus americana	15.0	0.34	20.0	7.6	3.3	4.7	5.2
Tilia americana	10.0	0.22	30.0	5.1	2.1	7.0	4.7
Sassafras albidum	12.5	0.12	20.0	6.3	1.2	4.7	4.1
Carya ovata	7.5	0.15	20.0	3.8	1.4	4.7	3.3
Carya tomentosa	5.0	0.21	20.0	2.5	2.0	4.7	3.1
Fraxinus pennsylvanica	5.0	0.04	20.0	2.5	0.4	4.7	2.5
Carya cordiformis	2.5	0.18	10.0	1.3	1.7	2.3	1.8
Carya glabra	2.5	0.18	10.0	1.3	1.7	2.3	1.8
Quercus muehlenbergii	2.5	0.08	10.0	1.3	0.7	2.3	1.4
Cornus florida	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
Quercus alba	95.5	6.70	100.0	34.7	51.2	20.8	35.5
Acer saccharum	77.3	1.59	100.0	28.1	12.1	20.8	20.3
Quercus muehlenbergii	29.5	1.67	54.5	10.7	12.7	11.3	11.6
Quercus rubra	18.2	1.36	45.5	6.6	10.4	9.4	8.8
Fraxinus americana	9.1	0.36	36.4	3.3	2.7	7.5	4.5
Carya glabra	6.8	0.33	27.3	2.5	2.5	5.7	3.6
Ostrya virginiana	9.1	0.05	18.2	3.3	0.4	3.8	2.5
Juglans nigra	4.5	0.23	18.2	1.7	1.8	3.8	2.4
Ulmus rubra	6.8	0.08	18.2	2.5	0.6	3.8	2.3
Carya ovata	4.5	0.13	18.2	1.7	1.0	3.8	2.1
Tilia americana	4.5	0.28	9.1	1.7	2.2	1.9	1.9
Quercus velutina	2.3	0.11	9.1	0.8	0.8	1.9	1.2
Fraxinus pennsylvanica	2.3	0.08	9.1	0.8	0.6	1.9	1.1
Carya tomentosa	2.3	0.07	9.1	0.8	0.6	1.9	1.1
Ulmus americana	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
Quercus rubra	75.00	1.17	66.7	39.1	43.0	18.2	33.5
Acer saccharum	41.67	0.28	100.0	21.7	10.1	27.3	19.7
Quercus alba	25.00	0.75	33.3	13.0	27.6	9.1	16.6
Carya ovata	16.67	0.30	33.3	8.7	11.0	9.1	9.6
Quercus velutina	8.33	0.15	33.3	4.3	5.6	9.1	6.3
Sassafras albidum	8.33	0.05	33.3	4.3	1.7	9.1	5.1
Cornus florida	8.33	0.01	33.3	4.3	0.5	9.1	4.6
Ostrya virginiana	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
Quercus alba	150.0	0.61	100.0	31.6	52.3	16.7	33.5
Acer saccharum	125.0	0.20	100.0	26.3	17.6	16.7	20.2
Fraxinus americana	100.0	0.10	100.0	21.1	9.0	16.7	15.6
Quercus muehlenbergii	50.0	0.10	100.0	10.5	8.4	16.7	11.9
Juglans nigra	25.0	0.13	100.0	5.3	11.6	16.7	11.2
Carya tomentosa	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
Quercus alba	134.5	31.01	100.0	45.2	59.1	21.1	41.8
Quercus velutina	36.5	7.93	78.4	12.3	15.1	16.6	14.7
Quercus rubra	38.5	5.58	62.2	13.0	10.6	13.1	12.2
Acer saccharum	23.0	3.66	51.4	7.7	7.0	10.9	8.5
Carya glabra	20.9	2.29	54.1	7.0	4.4	11.4	7.6
Fraxinus americana	12.2	0.71	32.4	4.1	1.4	6.9	4.1
Carya tomentosa	8.1	0.75	24.3	2.7	1.4	5.1	3.1
Cornus florida	7.4	0.11	24.3	2.5	0.2	5.1	2.6
Sassafras albidum	7.4	0.19	18.9	2.5	0.4	4.0	2.3
Ostrya virginiana	2.7	0.04	10.8	0.9	0.1	2.3	1.1
Carya ovata	2.7	0.05	8.1	0.9	0.1	1.7	0.9
Tilia americana	2.7	0.15	5.4	0.9	0.3	1.1	0.8
Quercus muehlenbergii	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
Acer saccharum	96.9	2.44	100.0	51.7	40.6	28.6	40.3
Quercus rubra	15.6	0.88	37.5	8.3	14.6	10.7	11.2
Tilia americana	18.8	0.48	37.5	10.0	8.1	10.7	9.6
Quercus alba	12.5	0.63	37.5	6.7	10.4	10.7	9.3
Fraxinus americana	15.6	0.25	37.5	8.3	4.2	10.7	7.8
Populus deltoides	3.1	0.59	12.5	1.7	9.8	3.6	5.0
Carya glabra	6.3	0.31	12.5	3.3	5.2	3.6	4.0
Ulmus rubra	3.1	0.20	12.5	1.7	3.3	3.6	2.8
Carya cordiformis	3.1	0.17	12.5	1.7	2.8	3.6	2.7
Sassafras albidum	3.1	0.02	12.5	1.7	0.3	3.6	1.9
Asculus glabra	3.1	0.02	12.5	1.7	0.3	3.6	1.8
Ulmus americana	3.1	0.01	12.5	1.7	0.2	3.6	1.8
Ostrya virginiana	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.

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

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

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

Table continued on next page.

Table 6. Continued.

	Aspect						All Plots				
	Diameter (stems/ha)										
Species	**East**	**West**	**North**	**South**	**Ridge**	**Valley**	**Den. (stems/ha)**	**Rel. den.**	**Freq. (%)**	**Rel. freq.**	**IV**
Crataegus pruinosa	200.0	--	--	--	108.1	--	85.7	0.3	0.6	0.5	0.4
Lindera benzoin	--	--	--	--	--	1250.0	142.9	0.6	0.3	0.3	0.4
Morus rubra	200.0	--	--	--	54.1	--	57.1	0.2	0.6	0.5	0.4
Tilia americana	200.0	--	666.7	--	--	--	57.1	0.2	0.6	0.5	0.4
Carpinus caroliniana	400.0	--	--	--	--	--	57.1	0.2	0.3	0.3	0.2
Celtis occidentalis	200.0	--	--	--	--	--	28.6	0.1	0.3	0.3	0.2
Euonymous atropurpurea	--	--	--	--	--	250.0	28.6	0.1	0.3	0.3	0.2
Quercus muehlenbergii	--	--	666.7	--	--	--	28.6	0.1	0.3	0.3	0.2
Sambucus canadensis	--	--	--	--	--	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 glaucodea 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 pensylvanica 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 Poiret; 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

Caesalpiniaceae
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
Euoynomus 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 tricorne 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