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## The Flora of Brush Creek Canyon State Preserve

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# The Flora of Brush Creek Canyon State Preserve<sup>1</sup>

LAWRENCE J. EILERS<sup>2</sup>

EILERS, LAWRENCE J. (Department of Biology, University of Northern Iowa, Cedar Falls, Iowa 50613). The Flora of Brush Creek Canyon State Preserve. *Proc. Iowa Acad. Sci.* 81(4): 150-157, 1974. Brush Creek Canyon State Preserve is a scenic natural area in Fayette County, Iowa. The preserve contains steep, wooded ravines; tall, vertical outcrops of dolomitic limestone; clear streams; cascades area; and cool springs. These habitats support

a variety of native plant communities, resulting in a rich flora of at least 268 species of vascular plants. Man-made disturbance is minimal, and there are several species of rare plants that increase the importance of the preserve.

INDEX DESCRIPTORS: Brush Creek Canyon State Preserve, Iowa Native Plants, Iowa Natural Areas, Flora, Plant Communities, Preserves.

Brush Creek Canyon State Preserve in Fayette County is one of Iowa's striking natural areas. Brush Creek winds its way through rocky ravine walls, forming a lovely wooded area of high relief (Figure 1). The variations in angle of slope, amount of shading and depth of soil combine to produce a diversity of habitats, each supporting a somewhat different woodland community. Rock outcrops furnish additional plant habitats, as do the streams with their associated alluvial flats. As a result of the diversity of habitats, Brush Creek Canyon supports a rich and varied flora.

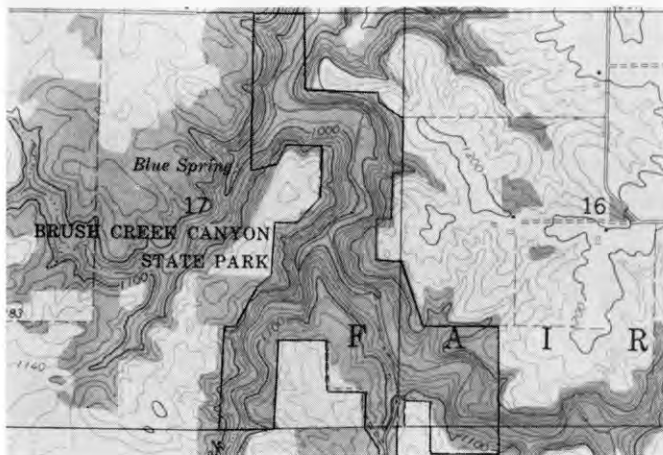


Figure 1. Topographic map of Brush Creek Canyon State Preserve.

## NATURAL HISTORY

Brush Creek is a rapid stream with considerable fall, and it created steep ravines as it cut its way down through more than 100 feet of the bedrock. The rock that forms the walls of these ravines is a dolomitic limestone (dolomite) belonging to the Alexandrian series of Silurian age.

<sup>1</sup> I wish to thank the Iowa State Preserves Advisory Board for the grant-in-aid which made this research possible.

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Figure 2. Aerial photograph.

The preserve is on the northern edge of the area last covered by the Kansan glaciation, and a few miles to the south one encounters the gently rolling topography characteristic of the Iowan erosional surface of the Kansan till. Little of this till remains in the preserve; the streams have swept most of it away since the time of the Kansan glaciation. Only

scattered glacial erratics remain along the stream bed as evidence.

NOTES ON THE PLANT COMMUNITIES OF BRUSH CREEK CANYON

The plant communities described below have been delimited subjectively, based on my experience and observations in the field during the growing season of 1972. An aerial photograph (Figure 2) shows clearly that the dominant vegetational type is woodland. Figure 3 illustrates the locations and extent of the several kinds of woodland present, and also locates some of the other smaller plant communities.

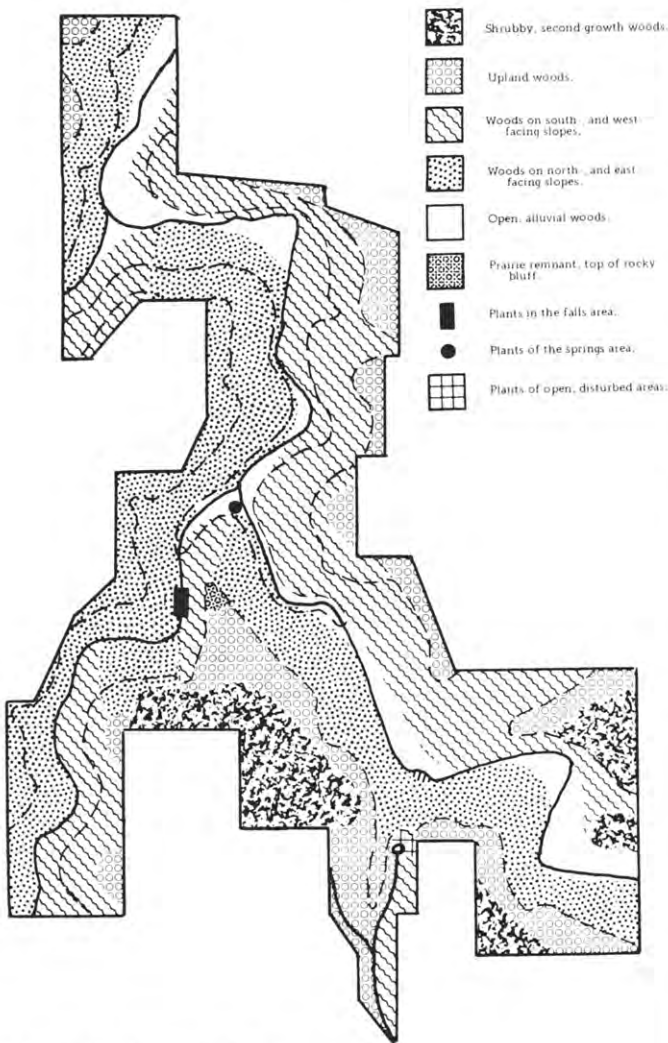


Figure 3. Vegetation map.

List of Plant Communities

1. Shrubby, second-growth woods.
2. Upland woods.
3. Woods on south- and west-facing slopes.
4. Woods on north- and east-facing slopes.
5. Edge of woods along picnic area.
6. Open, alluvial woods.
7. Prairie remnant, top of rocky bluff.

8. Plants on vertical, dry rock outcrops.
9. Plants on vertical, moist rock outcrops.
10. Plants of the cascades area.
11. Plants of the springs area.
12. Plants of open, disturbed areas.

Description of Plant Communities

1. Shrubby, Second-Growth Woods

There are several shrubby places in the southern part of the preserve (Figure 3). Evidently, the largest of these had been nearly cleared at one time. Since then, succession of the vegetation has been toward re-establishing an upland woods community. Staghorn sumac (*Rhus typhina*) is the dominant woody species at present, forming dense thickets. Missouri gooseberry (*Ribes missouriensis*) is also very common, along with blackberries and raspberries (*Rubus* spp.). The herbaceous flora reflects the open nature of the habitat: wild bergamot (*Monarda fistulosa*), thimbleweed (*Anemone virginiana*) and giant goldenrod (*Solidago gigantea*) are found throughout. Pioneer tree species that are invading the area are box elder (*Acer negundo*) and quaking aspen (*Populus tremuloides*), though seedlings, saplings and occasional mature trees of the climax vegetation occur here and there.

2. Upland Woods

The upland woods community (Figure 4) covers the flat-



Figure 4. Upland woods.



to-gently-rolling land of the highest elevations. The woods are more open than those of the shaded ravines. Shagbark hickory (*Carya ovata*) and beaked hazelnut (*Corylus cornuta*) are characteristic species. Associated species are American hazelnut (*Corylus americana*), gray dogwood (*Cornus racemosa*), wild honeysuckle (*Lonicera prolifera*), May apple (*Podophyllum peltatum*) and wild geranium (*Geranium maculatum*). There are usually no well-marked discontinuities separating the upland woods from the adjacent wooded habitats, and some common plants of the neighboring slopes are found here and there on the uplands, also. Basswood (*Tilia americana*), red elm (*Ulmus americana*), pagoda dogwood (*Cornus alternifolia*) and toothwort (*Dentaria laciniata*) are examples.

### 3. Woods on South- and West-Facing Slopes

Because they receive the full force of the afternoon sun, the microclimate within these woods (Figure 5) is some-



Figure 5. West-facing woods with dry rock outcrop at left.

what warmer and drier than that of the other wooded habitats. The species composition is not much different from the upland woods, but oaks, particularly white oak (*Quercus alba*), make up a greater percentage of the canopy. Blue beech (*Carpinus caroliniana*) and ironwood (*Ostrya virgini-*

*ana*) are also more prevalent. Leatherwood (*Dirca palustris*) and bladdernut (*Staphylea trifolia*) are found on the higher parts of these slopes. Toward the ravine bottom the shading increases and this habitat merges with the next.

### 4. Woods on North- and East-Facing Slopes

These woods are deeply shaded, humid and cool. The dominant trees are sugar maple (*Acer saccharum*) and basswood, but the most characteristic species seem to be shinleaf (*Pyrola elliptica*) and American yew (*Taxus canadensis*). Here is where the spring woodland wildflowers are found in greatest abundance. *Hepatica acutiloba*, bloodroot (*Sanguinaria canadensis*), wild ginger (*Asarum canadense*), dutchman's breeches (*Dicentra cucullaria*), bishop's cap (*Mitella diphylla*) and others occur in dense patches.

### 5. Edge of Woods Along Picnic Area

This artificially-maintained ecotone supports a mixed assemblage of plant species. Shrubs and briers are particularly noticeable, e.g., staghorn sumac (*Rhus typhina*), hazelnut (*Corylus americana*), chokecherry (*Prunus virginiana*), common blackberry (*Rubus allegheniensis*), black raspberry (*R. occidentalis*), and prickly ash (*Xanthoxylum americanum*).

### 6. Open, Alluvial Woods

Stretching along the course of Brush Creek is a ribbon of low, open woodland (Figure 6). The water table is close to



Figure 6. Open, alluvial woods.

the surface near the stream and parts of the area are subject to periodic flooding. One finds the greatest diversity of plant species here because of the rich soil, abundant moisture and the open nature of the habitat. The majority of the "weedy" adventives in the preserve are found here. Many of these are annuals or biennials that reseed year after year and cannot survive in competition with the native perennial plants of the woodlands. The characteristic trees are box elder, green ash (*Fraxinus pennsylvanica*), cottonwood (*Populus deltoides*), heart-leaved willow (*Salix rigida*), hackberry (*Celtis occidentalis*) and American elm (*Ulmus americana*).

### 7. Prairie Remnant, Top of Rocky Bluff

A sparse prairie vegetation is found on top of a large block of dolomite above the cascades area. Probably the western, shadeless exposure maintains a suitable habitat for this small plant community. Big bluestem (*Andropogon gerardi*) grows here along with bush clover (*Lespedeza capitata*), flowering



spurge (*Euphorbia corollata*), lead plant (*Amorpha canescens*) and wild quinine (*Parthenium integrifolium*).

A unique feature of this habitat is a small population of the low, semi-viny shrub, bearberry (*Arctostaphylos uva-ursi*). This appears to be the only verified site for this species in Iowa, though it is common in northern Minnesota and Wisconsin. The presence of this species makes the preserve all the more important.

#### 8. Plants on Vertical, Dry Rock Outcrops

There are few plants that can withstand the severe conditions imposed by an exposed, dry rock wall. Of these, the smooth cliff-brake fern (*Pellaea glabella*), growing out of crevices in the dolomite, and pellitory (*Parietaria pennsylvanica*) and prickly gooseberry (*Ribes cynosbati*), growing on the rock ledges, are most common.

#### 9. Plants on Vertical, Moist Rock Outcrops

A different assemblage of plants grows on the dolomite walls where they are shaded most of the day and the humidity is higher. Three ferns were found: the slender cliff-brake (*Cryptogramma stelleri*), the common bladder fern (*Cystopteris fragilis*) and the bulblet bladder fern (*Cystopteris bulbifera*). On the upper walls wild spikenard (*Aralia racemosa*), woodland strawberry (*Fragaria vesca*) and American yew occur; shaded rock faces along the streams support harebell

(*Campanula rotundifolia*), clearweed (*Pilea pumila*), and in two particularly sheltered locations, *Sullivantia renifolia* (Figure 7).

#### 10. Plants of the Cascades Area

Huge, jumbled blocks of dolomite nearly choke the V-shaped ravine below the prairie remnant (Figure 8). Here the stream forms a series of small cascades as it tumbles over the boulders. After a heavy rain the roar of the falling water fills the ravine. In my opinion, this is one of the loveliest spots in Iowa. It is always intensely green during the growing season because the boulders are covered with mosses, liverworts, walking fern (*Asplenium rhizophyllum*), and bishop's cap. The banks of the ravine are lush with a dense growth of waterleaf (*Hydrophyllum virginianum*), false rue anemone (*Isopyrum biternatum*), sweet cicely (*Osmorhiza claytoni*) and anise-root (*Osmorhiza longistylis*), among others.

#### 11. Plants of the Springs Area

This is only a small spring where a clump of marsh marigold (*Caltha palustris*) grows. But the water is cool and fresh and it is a spot worth visiting.

#### 12. Plants of Open, Disturbed Areas

There are only a few markedly man-disturbed areas in Brush Creek Canyon—roadsides and the small picnic areas—



Figure 7. *Sullivantia renifolia* on moist, shaded rock outcrop.

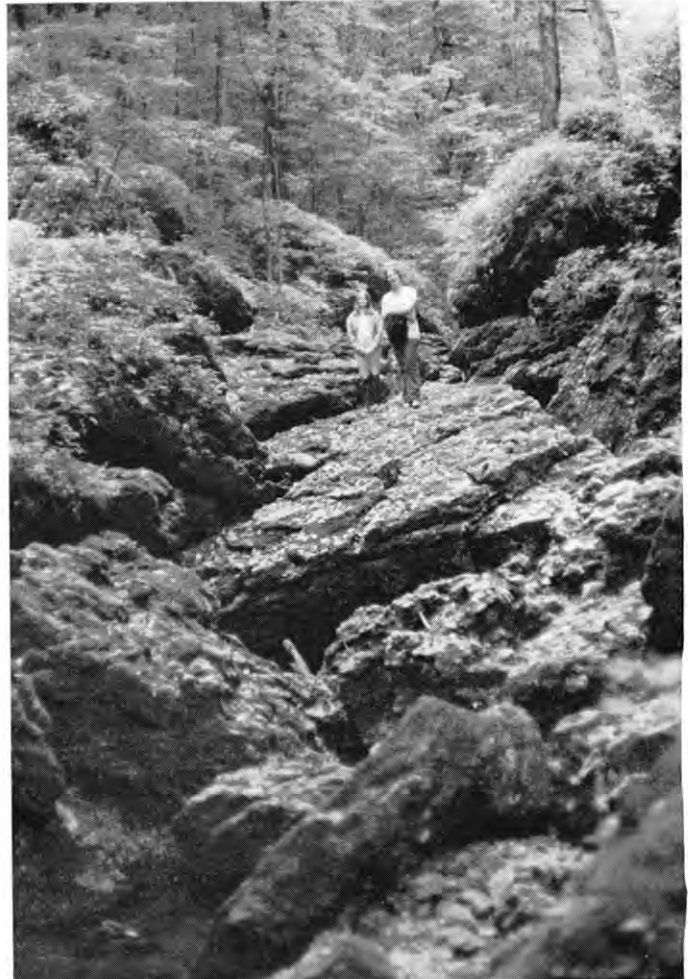


Figure 8. Boulders in the cascades area.

a measure of the quality of the preserve. The mowing of the picnic grounds and maintenance of the road allow introduced plants to grow here that don't succeed elsewhere in competition with the native vegetation. Examples are white clover (*Trifolium repens*) and red clover (*Trifolium pratense*), along with plantain (*Plantago rugelii*), timothy (*Phleum pratense*) and Kentucky bluegrass (*Poa pratensis*).

## CHECKLIST OF PLANTS AND THEIR HABITATS

The vascular plants listed below were found in Brush Creek Canyon State Preserve during the growing season of 1972. Voucher specimens were collected for each species cited in the checklist and were deposited in the University of Northern Iowa Herbarium. Although the preserve was visited at least six times during that period, it is likely that a few rare and interesting plants were missed. Thus, I would appreciate learning of any plants that are not listed below.

Within each major category of plants in the checklist (ARTHROPHYTA, PTERIDOPHYTA, etc.), the plant families are in alphabetical order with the genera and species in each family also arranged alphabetically. An asterisk before the scientific binomial indicates that the plant is not native to Iowa. A common name (if different from the genus name) is given in parentheses after the binomial. This is followed by numbers indicating the plant communities in which the plant was found (see the list of plant communities above).

Many of these plants have several common names. Since there are no rules governing the application of common names, the reader is free to use whatever names he prefers. The scientific names can be found in regional manuals (Fernald, 1950; Gleason and Cronquist, 1963) except in a few cases where recent study has shown that another name is more appropriate.

## ARTHROPHYTA (Horsetails and Scouring Rushes)

Equisetaceae (Horsetail and Scouring Rush Family)

*Equisetum hyemale* L. (Scouring Rush)—6

## PTERIDOPHYTA (Ferns and Relatives)

Ophioglossaceae (Adder's-Tongue Family)

*Botrychium virginianum* (L.) Sw. (Rattlesnake Fern)—2, 4, 6

Osmundaceae (Cinnamon Fern Family)

*Osmunda claytoniana* L. (Interrupted Fern)—4

Pteridaceae (Bracken Fern Family)

*Adiantum pedatum* L. (Maidenhair Fern)—2, 4*Cryptogramma stelleri* (Gmel.) Prantl (Slender Cliff-Brake)—9*Pellaea glabella* Mett. (Smooth Cliff-Brake)—8

Aspidiaceae (Shield Fern Family)

*Athyrium filix-femina* (L.) Roth (Lady Fern)—4*Cystopteris bulbifera* (L.) Bernh. (Bulblet Bladder Fern)—4, 9*C. fragilis* (L.) Bernh. (Common Bladder Fern)—3, 4, 6, 9*Thelypteris hexagonoptera* (Michx.) Weatherby (Broad Beech Fern)—4

Aspleniaceae (Spleenwort Family)

*Asplenium rhizophyllum* L. (Walking Fern)—10

## CONIFEROPHYTA (Conifers)

Cupressaceae (Cypress Family)

*Juniperus communis* L. var. *depressa* Pursh (Ground Juniper)—7*J. virginiana* L. (Red Cedar)—1, 2, 6, 7

Taxaceae (Yew Family)

*Taxus canadensis* Marsh. (American Yew)—4, 7, 8, 9

## ANTHOPHYTA (Flowering Plants)

Dicotyledonae (Dicots)

Aceraceae (Maple Family)

*Acer negundo* L. (Box Elder)—1, 5, 6*A. nigrum* Michx. f. (Black Maple)—4, 9*A. saccharinum* L. (Silver Maple)—1, 3*A. saccharum* Marsh. (Sugar Maple)—3, 4, 5

Amaranthaceae (Amaranth Family)

\**Amaranthus retroflexus* L. (Pigweed)—6

Anacardiaceae (Cashew Family)

*Rhus glabra* L. (Smooth Sumac)—5*R. radicans* L. (Poison Ivy)—4, 6*R. typhina* L. (Staghorn Sumac)—1, 5, 6

Apocynaceae (Dogbane Family)

*Apocynum androsaemifolium* L. (Spreading Dogbane)—7

Araliaceae (Ginseng Family)

*Aralia nudicaulis* L. (Wild Sarsaparilla)—4*A. racemosa* L. (Spikenard)—4, 9*Panax quinquefolium* L. (Ginseng)—4

Aristolochiaceae (Birthwort Family)

*Asarum canadense* L. (Wild Ginger)—4, 9, 10

Asclepiadaceae (Milkweed Family)

*Asclepias exaltata* L. (Poke Milkweed)—6*A. incarnata* L. (Swamp Milkweed)—6

Balsaminaceae (Touch-Me-Not Family)

*Impatiens biflora* Walt. (Spotted Touch-Me-Not)—6

Berberidaceae (Barberry Family)

*Caulophyllum thalictroides* (L.) Michx. (Blue Cohosh)—2, 4*Podophyllum peltatum* L. (May Apple)—2, 4, 5

Betulaceae (Birch Family)

*Betula papyrifera* Marsh. (Canoe Birch)—6, 7*Carpinus caroliniana* Walt. (Musclewood, Blue Beech)—2, 3, 4, 8*Corylus americana* Walt. (Hazelnut)—2, 5*C. cornuta* Marsh. (Beaked Hazelnut)—2, 4*Ostrya virginiana* (Mill.) K. Koch (Ironwood, Hop Hornbeam)—2, 3, 4, 5

Boraginaceae (Borage Family)

*Lithospermum canescens* (Michx.) Lehm. (Puccoon)—7*L. latifolium* Michx.—5

Campanulaceae (Bluebell Family)

*Campanula americana* L. (Tall Bellflower)—6*C. rotundifolia* L. (Harebell)—8, 9*Lobelia inflata* L. (Indian Tobacco)—12*L. siphilitica* L. (Great Lobelia)—6

Caprifoliaceae (Honeysuckle Family)

*Lonicera dioica* L. (Wild Honeysuckle)—4*L. prolifera* (Kirchn.) Rehd. (Wild Honeysuckle)—2*Sambucus canadensis* L. (Common Elder)—6*Triosteum aurantiacum* Bickn. (Horse Gentian)—2*Viburnum lentago* L. (Nannyberry)—2, 3, 6, 7\**V. opulus* L. var. *opulus* (High-Bush Cranberry)—6*V. rafinesquianum* Schultes (Downy Arrowwood)—2, 3, 4

Caryophyllaceae (Pink Family)

*Arenaria lateriflora* L. (Sandwort)—4\**Cerastium vulgatum* L. (Mouse-Ear Chickweed)—6\**Lychnis alba* Mill. (White Campion)—6

Celastraceae (Staff-Tree Family)

*Celastrus scandens* L. (Bittersweet)—4, 7*Euonymus atropurpureus* Jacq. (Wahoo, Burning Bush)—6

Chenopodiaceae (Goosefoot Family)

\**Chenopodium album* L. (Goosefoot, Lamb's Quarters)—6

Compositae (Sunflower Family)

- Ambrosia artemisiifolia* L. (Ragweed)—6  
*Antennaria plantaginifolia* (L.) Richards (Pussy-Toes)—7  
 \**Arctium minus* (Hill) Bernh. (Burdock)—6  
*Aster ontarionis* Wieg.—2  
*A. prenanthoides* Muhl.—6  
*A. sagittifolius* Willd.—4, 7  
*A. simplex* Willd.—6  
*Bidens frondosa* L. (Stick-Tight, Spanish Needle)—10  
 \**Cirsium vulgare* (Savi) Tenore (Bull Thistle)—6  
*Erigeron annuus* (L.) Pers. (Daisy Fleabane)—2, 5, 6  
*E. strigosus* Muhl. (Daisy Fleabane)—6  
*Eupatorium purpureum* L. (Joe-Pye Weed)—6  
*E. rugosum* Houtt. (White Snakeroot)—6  
*Helenium autumnale* L. (Sneezeweed)—6  
*Helianthus tuberosus* L. (Jerusalem Artichoke)—6  
*Heliopsis helianthoides* (L.) Sweet (Ox-Eye)—6  
*Krigia biflora* (Walt.) Blake (Cynthia)—7  
*Parthenium integrifolium* L. (Wild Quinine)—7  
*Polymnia canadensis* L. (Leafcup)—10  
*Prenanthes alba* L. (Rattlesnake Root)—5, 6  
*Ratibida pinnata* (Vent.) Barnh. (Coneflower)—6, 7  
*Rudbeckia laciniata* L. (Tall Coneflower)—6  
*R. triloba* L. (Brown-Eyed-Susan)—6  
*Senecio aureus* L. (Golden Ragwort)—6  
*Silphium perfoliatum* L. (Cup Plant)—6  
*Solidago flexicaulis* L. (Zig-Zag Goldenrod)—4, 6  
*S. gigantea* Ait. (Giant Goldenrod)—1, 6  
*S. hispida* Muhl. (Goldenrod)—7  
*S. nemoralis* Ait. (Goldenrod)—7  
 \**Taraxacum officinale* Weber (Common Dandelion)—5, 11  
     Cornaceae (Dogwood Family)  
*Cornus alternifolia* L. (Alternate-Leaved Dogwood, Pagoda Dogwood)—2, 3, 4, 5, 9, 10  
*C. obliqua* Raf. (Silky Dogwood)—6  
*C. racemosa* Lam. (Gray Dogwood)—1, 2, 4, 5  
*C. rugosa* Lam. (Speckled Dogwood)—2, 8  
     Cruciferae (Mustard Family)  
 \**Barbarea vulgaris* R. Br. (Yellow Rocket)—6  
 \**Brassica juncea* (L.) Coss. (Chinese Mustard)—6  
 \**Capsella bursa-pastoris* (L.) Medic. (Shepherd's Purse)—6  
*Dentaria laciniata* Muhl. (Toothwort)—2, 4  
 \**Sisymbrium officinale* (L.) Scop. (Hedge Mustard)—6  
     Curcubitaceae (Gourd Family)  
*Echinocystis lobata* (Michx.) T. & G. (Wild Balsam-Apple)—6  
     Ericaceae (Heath Family)  
*Arcotostaphylos uva-ursi* (L.) Spreng. (Bearberry)—7  
*Pyrola elliptica* Nutt. (Shinleaf)—4  
     Euphorbiaceae (Spurge Family)  
*Euphorbia corollata* L. (Flowering Spurge)—7  
     Fagaceae (Beech Family)  
*Quercus alba* L. (White Oak)—2, 3, 4, 7  
*Q. ellipsoidalis* E. J. Hill (Northern Pin Oak)—7  
*Q. macrocarpa* Michx. (Bur Oak)—7  
*Q. borealis* Michx. f. (Red Oak)—3, 4, 5, 7  
     Fumariaceae (Fumitory Family)  
*Dicentra cucullaria* (L.) Bernh. (Dutchman's Breeches)—4, 10  
     Geraniaceae (Geranium Family)  
*Geranium maculatum* L. (Wild Geranium)—2, 4, 5  
     Guttiferae (St.-John's-Wort Family)  
*Hypericum punctatum* Lam. (St.-John's-Wort)—6  
     Hydrophyllaceae (Waterleaf Family)  
*Hydrophyllum appendiculatum* Michx. (Waterleaf)—2  
     *H. virginianum* L. (Waterleaf)—2, 4, 5, 6, 10  
         Juglandaceae (Walnut Family)  
*Carya cordiformis* (Wang.) K. Koch (Bitternut Hickory)—1, 2, 3, 4, 5  
*C. ovata* (Mill.) K. Koch (Shagbark Hickory)—1, 2, 4, 5  
*Juglans cinerea* L. (Butternut)—1, 2, 3, 4, 6, 9  
         Labiatae (Mint Family)  
*Blephila hirsuta* (Pursh) Benth. (Wood Mint)—6  
 \**Glechoma hederacea* L. (Ground Ivy)—11  
*Lycopus americanus* Muhl. (Water Horehound)—6  
*Monarda fistulosa* L. (Wild Bergamot)—1, 6  
 \**Prunella vulgaris* L. (Self-Heal)—5, 6  
*Scutellaria parvula* Michx. (Skullcap)—7  
*Teucrium canadense* L. (Wood Sage)—6  
         Leguminosae (Clover Family)  
*Amorpha canescens* Pursh (Lead Plant)—7  
*Amphicarpa bracteata* (L.) Fern. (Hog Peanut)—4  
*Desmodium cuspidatum* (Muhl.) Loud. (Tick Clover)—7  
*D. glutinosum* (Muhl.) Wood (Tick Clover)—4, 5  
*Lespedeza capitata* Michx. (Bush Clover)—7  
 \**Lotus corniculatus* L. (Bird's-Foot Trefoil)—6  
 \**Medicago lupulina* L. (Black Medic)—6  
 \**Melilotus alba* Desr. (White Sweet Clover)—6  
 \**Trifolium hybridum* L. (Alsike Clover)—6  
 \**T. pratense* L. (Red Clover)—5, 6, 12  
 \**T. repens* L. (White Clover)—12  
         Malvaceae (Mallow Family)  
 \**Abutilon theophrasti* Medic. (Velvet Leaf)—6  
         Menispermaceae (Moonseed Family)  
*Menispermum canadense* L. (Moonseed)—3  
         Moraceae (Mulberry Family)  
 \**Cannabis sativa* L. (Hemp)—6  
         Oleaceae (Olive Family)  
*Fraxinus americana* L. (White Ash)—2, 3, 4, 5  
*F. nigra* Marsh. (Black Ash)—2, 4, 6, 9  
*F. pennsylvanica* Marsh. (Green Ash)—1, 6  
         Onagraceae (Evening Primrose Family)  
*Circaea quadrisulcata* (Maxim.) Franch. & Sav. (Enchanter's Nightshade)—3, 4  
*Oenothera biennis* L. (Evening Primrose)—12  
         Oxalidaceae (Wood Sorrel Family)  
*Oxalis stricta* L. (Wood Sorrel)—6, 9  
         Papaveraceae (Poppy Family)  
*Sanguinaria canadensis* L. (Bloodroot)—4, 5, 7  
         Phrymaceae (Lopseed Family)  
*Phryma leptostachya* L. (Lopseed)—3, 4  
         Plantaginaceae (Plantain Family)  
*Plantago rugelii* Dcne. (Plantain)—6, 12  
         Polemoniaceae (Phlox Family)  
*Phlox divaricata* L. (Woodland Phlox)—3, 4, 6  
 \**P. paniculata* L. (Garden Phlox)—6  
*Polemonium reptans* L. (Jacob's Ladder)—2, 4, 6  
         Polygonaceae (Buckwheat Family)  
 \**Polygonum persicaria* L. (Lady's Thumb)—6  
*P. scandens* L. (False Buckwheat)—5  
*P. virginianum* L. (Johnny Jump-Seed)—6  
 \**Rumex crispus* L. (Curly Dock)—6  
         Portulacaceae (Purslane Family)  
*Claytonia virginica* L. (Spring Beauty)—2, 4, 6, 11  
         Primulaceae (Primrose Family)  
*Lysimachia ciliata* L. (Loosestrife)—6  
 \**L. nummularia* L. (Moneywort)—6  
         Ranunculaceae (Buttercup Family)  
*Actaea pachypoda* Ell. (White Baneberry)—4

- A. rubra* (Ait.) Willd. (Red Baneberry)—8  
*Anemone quinquefolia* L. (Wood Anemone)—4  
*A. virginiana* L. (Thimbleweed)—1, 3, 4  
*Aquilegia canadensis* L. (Columbine)—4, 5, 7  
*Caltha palustris* L. (Marsh Marigold)—11  
*Clematis virginiana* L. (Virgin's Bower)—6  
*Hepatica acutiloba* DC. (Liver Leaf)—4, 10  
*Isoopyrum biternatum* (Raf.) T. & G. (False Rue-Anemone)—4, 6, 8, 10  
*Ranunculus abortivus* L. (Small-Flowered Buttercup)—4, 5, 8, 10, 11  
*R. septentrionalis* Poir. (Marsh Buttercup)—6  
*Thalictrum dasycarpum* Fisch. & Lall. (Meadow Rue)—6  
     Rosaceae (Rose Family)  
*Agrimonia gryposepala* Wallr. (Agrimony)—5, 12  
*Amelanchier arborea* (Michx. f.) Fern. (Serviceberry)—3, 4  
*Fragaria vesca* L. (Woodland Strawberry)—4, 8, 9  
*F. virginiana* Duch. (Wild Strawberry)—6, 7  
*Geum canadense* Jacq. (White Avens)—4, 5  
*Physocarpus opulifolius* (L.) Maxim. (Nine-Bark)—6, 8  
*Potentilla rivalis* Nutt. (Cinquefoil)—6  
*P. simplex* Michx. (Common Cinquefoil)—2  
*Prunus americana* Marsh. (Wild Plum)—6  
*P. serotina* Ehrh. (Wild Black Cherry)—1, 3, 4, 5, 6  
*P. virginiana* L. (Chokecherry)—2, 3, 4, 5, 7  
*Rubus allegheniensis* Porter (Common Blackberry)—1, 3, 5, 6  
*R. occidentalis* L. (Black Raspberry)—1, 4, 5, 6  
*R. strigosus* Michx. (Wild Red Raspberry)—4, 6  
 \**Sorbus aucuparia* L. (European Mountain Ash)—3  
     Rubiaceae (Madder Family)  
*Galium aparine* L. (Cleavers, Goose Grass)—5  
*G. boreale* L. (Northern Bedstraw)—7  
*G. concinnum* T. & G. (Bedstraw)—4, 5  
*G. triflorum* Michx. (Sweet-Scented Bedstraw)—5, 6  
     Rutaceae (Citrus Family)  
*Xanthoxylum americanum* Mill. (Prickly Ash)—2, 4, 5, 6  
     Salicaceae (Willow Family)  
*Populus deltoides* Marsh. (Cottonwood)—5, 6  
*P. grandidentata* Michx. (Large-Toothed Aspen)—2, 3  
*P. tremuloides* Michx. (Quaking Aspen)—1, 2, 4, 5, 7  
 \**Salix fragilis* L. (Crack-Willow)—6  
*S. rigida* Muhl. (Heart-Leaved Willow)—6  
     Santalaceae (Sandalwood Family)  
*Comandra umbellata* (L.) Nutt. (Bastard Toad-Flax)—7  
     Saxifragaceae (Saxifrage Family)  
*Heuchera richardsonii* R. Br. (Alum Root)—6  
*Mitella diphylla* L. (Bishop's Cap)—4, 10  
*Ribes americanum* Mill. (Wild Black Currant)—6  
*R. cynosbati* L. (Prickly Gooseberry)—4, 8, 9, 10  
*R. missouriensis* Nutt. (Gooseberry)—1, 5  
*Sullivantia renifolia* Rosend.—9  
     Scrophulariaceae (Figwort Family)  
*Mimulus ringens* L. (Monkey Flower)—6  
*Scrophularia marilandica* L. (Figwort)—6  
 \**Verbascum thapsus* L. (Mullein)—6  
*Veronicastrum virginicum* (L.) Farw. (Culver's Root)—4  
     Solanaceae (Nightshade Family)  
 \**Solanum nigrum* L. (Black Nightshade)—6  
     Staphyleaceae (Bladdernut Family)  
*Staphylea trifolia* L. (Bladdernut)—3, 4  
     Thymeleaceae (Mesereum Family)  
*Dirca palustris* L. (Leatherwood)—3, 4  
     Tiliaceae (Linden Family)  
*Tilia americana* L. (Basswood)—1, 2, 3, 4, 5, 7, 9  
     Ulmaceae (Elm Family)  
*Celtis occidentalis* L. (Hackberry)—3, 6  
*Ulmus americana* L. (American Elm)—1, 4, 5, 6  
*U. rubra* Muhl. (Red Elm, Slippery Elm)—1, 2, 4, 5, 6  
     Umbelliferae (Parsley Family)  
*Cicuta bulbifera* L. (Cowbane)—6  
*Cryptotaenia canadensis* (L.) DC. (Honewort)—4  
*Heracleum lanatum* Michx. (Cow Parsnip)—6  
*Osmorhiza claytoni* (Michx.) C. B. Clarke (Sweet Cicely)—4, 5, 10  
*O. longistylis* (Torr.) DC. (Anise-Root)—4, 10  
*Pastinaca sativa* L. (Wild Parsnip)—6  
*Sanicula gregaria* Bickn. (Black Snakeroot)—4  
*S. marilandica* L. (Black Snakeroot)—4, 5  
*Thaspium barbinode* (Michx.) Nutt. (Meadow Parsnip)—6  
*Zizia aurea* (L.) K. Koch (Golden Alexanders)—8  
     Urticaceae (Nettle Family)  
*Laportea canadensis* (L.) Wedd. (Wood Nettle)—10  
*Parietaria pensylvanica* Muhl. (Pellitory)—8  
*Pilea pumila* (L.) Gray (Clear-Weed)—6, 9  
*Urtica procera* Muhl. (Nettle)—6  
     Violaceae (Violet Family)  
*Viola eriocarpa* Schw. (Smooth Yellow Violet)—2, 4  
*V. papilionacea* Pursh (Meadow Violet)—6  
*V. renifolia* Gray (Kidney-Leaved Violet)—10  
*V. sororia* Willd. (Downy Blue Violet)—4, 6  
*V. papilionacea* Pursh X *V. sororia* Willd. (?)—6  
     Vitaceae (Vine Family)  
*Parthenocissus quinquefolia* (L.) Planch. (Virginia Creeper)—3, 4, 5  
*Vitis riparia* Michx. (Riverbank Grape)—2, 5, 6  
     ANTHOPHYTA (Flowering Plants)  
     Monocotyledonae (Monocots)  
     Araceae (Arum Family)  
*Arisaema triphyllum* (L.) Schott (Jack-in-the-Pulpit)—4  
     Cyperaceae (Sedge Family)  
*Carex albursina* Sheldon (Sedge)—3, 4  
*C. blanda* Dew.—10  
*C. convoluta* Mack.—4  
*C. hirtifolia* Mack.—4  
*C. pensylvanica* Lam.—7  
*C. sparganoides* Muhl.—4  
*Cyperus strigosus* L. (Galingale)—6  
     Dioscoreaceae (Yam Family)  
*Dioscorea villosa* L. (Wild Yam)—4  
     Gramineae (Grass Family)  
 \**Agrostis alba* L. (Redtop)—6  
*Andropogon gerardi* Vitman (Big Bluestem, Turkeyfoot)—6, 7  
 \**Bromus inermis* Leyss. (Smooth Brome)—6  
*B. pubescens* Muhl. ex Willd. (Brome Grass)—4  
*Echinochloa muricata* (Beauv.) Fern. (Barnyard Grass)—6  
*Elymus villosus* Muhl. (Wild Rye)—4  
*Festuca obtusa* Biehler (Fescue)—4, 6  
*Glyceria striata* (Lam.) Hitchc. (Manna Grass)—6  
*Hystrix patula* Moench. (Bottlebrush Grass)—4  
*Leersia virginica* Willd. (White Grass)—4  
*Muhlenbergia frondosa* (Poir.) Fern. (Muhly Grass)—6  
*Oryzopsis racemosa* (J. E. Smith) Bicker (Rice Grass)—4  
*Panicum latifolium* L. (Panic Grass)—4  
*P. leibergii* (Vasey) Scribn.—7  
*Phalaris arundinacea* L. (Reed Canary Grass)—6  
 \**Phleum pratense* L. (Timothy)—12



\**Poa pratensis* L. (Kentucky Bluegrass)—5, 12  
 \**Setaria faberi* Herrm. (Nodding Foxtail)—6  
 \**S. lutescens* (Weigel) Hubb. (Yellow Foxtail)—6  
     Iridaceae (Iris Family)  
*Sisyrinchium campestre* Bickn. (Blue-Eyed Grass)—7  
     Liliaceae (Lily Family)  
*Allium tricoccum* Ait. (Ramp, Wild Leek)—3, 4  
*Erythronium albidum* Nutt. (Trout Lily)—6  
 \**Hemerocallis fulva* L. (Day Lily)—6  
*Polygonatum biflorum* (Walt.) Ell. (Solomon's Seal)—5  
*Smilacina racemosa* (L.) Desf. (False Solomon's Seal)—4, 7,  
     9  
*S. stellata* (L.) Desf.—7  
*Smilax ecirrhata* (Engelm.) Wats. (Greenbriar)—4  
*S. hispida* Muhl. (Bristly Greenbriar)—3, 5, 6  
*Trillium flexipes* Raf. (Nodding Trillium)—2, 4

*Uvularia grandiflora* Sm. (Bellwort)—2, 4  
     Orchidaceae (Orchid Family)  
*Aplectrum hyemale* (Muhl.) Torr. (Putty-Root Orchid)—2  
*Cypripedium calceolus* L. var. *pubescens* (Willd.) Correll  
     (Yellow Lady-Slipper)—4  
*Orchis spectabilis* L. (Showy Orchis)—2  
 Totals: 75 families, 193 genera, 268 species.

LITERATURE CITED

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