

Vascular Flora of Thompson Woods, Jackson County, Illinois

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ABSTRACT

The vascular flora of Thompson Woods, a 7.3 ha old-growth forest remnant, was surveyed during the 1999-2001 growing seasons. A total of 338 species in 223 genera of 88 families were identified. This included 8 pteridophytes, 4 gymnosperms, 71 monocots, and 255 dicots. The families with the largest numbers of species were the Asteraceae and Poaceae with 28 each. The genera with the largest numbers of species were *Carex* (17) and *Quercus* (14). The dominant growth forms were woody plants followed by C₃ perennial forbs, and 79% of all species were perennial plants. Hemicryptophytes and phanerophytes were the dominant life forms and over 97% of all species had the C₃ photosynthetic pathway. Over 80% of all species were infrequent or rare, with only 9 species considered abundant. The forest has shifted, primarily over the past 21 years due to two severe windstorms and lack of subsequent management, from an overstory dominated by *Quercus* spp. to one dominated by a mixture of *Acer saccharum*, *Fagus grandifolia*, and *Prunus serotina*. Shade-tolerant native and invasive non-native species dominate the understory at present.

INTRODUCTION

Thompson Woods is located in east central Jackson County in the approximate center of the Southern Illinois University at Carbondale (SIUC) campus. The 7.3 ha (18-acre) forest was clear-cut between 1840 and 1850 when part of the public domain, and the lumber was used locally for building projects. The Thompson family purchased the forest in 1868 and they built a home at the south end of the woods and raised cattle on the property. Some *Quercus alba* were selectively removed for stave bolts for barrels in 1914. The woods were sold to SIUC in 1940 from Lavinia Thompson for \$6,250.00, with a gentleman's agreement that the forest remains in a natural condition. The forest was a popular place for picnicking in the 1940's and there was once a row of houses on the northeast corner of the woods at the intersection of Chautauqua and South Thompson streets (O'Malley 1993). Thompson Woods was identified by the Illinois Natural Areas Inventory during the 1970's as one of the finest upland old-growth *Quercus velutina* Lam. stands in the state, with trees estimated at 120 years old (White and Madany 1978). Two severe windstorms in 1980 resulted in a 42.5% decrease in *Quercus velutina* in the canopy (from 200 to 115 trees; Faulkner 1983, O'Malley 1993). Subsequent decisions by

SIUC administration not to manage the forest as a natural area has led to increases in mesophytic species in the canopy, little oak regeneration, and an understory dominated by invasive woody species such as *Euonymus fortunei* (Turcz.) Hand.-Maz., *Lonicera japonica* Thunb., and *L. maackii* (Rupr.) Maxim. Currently, a SIUC management committee is trying to restore the forest to its 1970's appearance with a combination of invasive and mesophytic plant control and planting of oak seedlings and saplings.

The objectives of the present study were to document the vascular flora of Thompson Woods and describe the flora in terms of growth forms, life forms, photosynthetic pathways, and dominant vegetation.

STUDY AREA

Thompson Woods is located in the Mount Vernon Hill Country Section of the Southern Till Plain Division (NE/4 NW/4 Sec. 28 T9S R1W), which represents the southernmost extent of Illinoian glaciation (Schwegman et al. 1973). The Mount Vernon Hill Country Section is characterized by hilly, rolling topography and was primarily forested in presettlement time dominated by *Quercus* spp. Upland soils of this section have developed from a combination of loess and glacial till and usually have a well-developed claypan or fragipan near the soil surface (Schwegman et al. 1973).

Soils of Thompson Woods are composed of Hosmer silt loam and Hosmer silty clay loam, which are moderately well drained upland soils with an underlying fragipan (typic fragiudalfs). Hosmer soils are formed from Peoria loess and are found on ridgetops and side slopes that range from two to 18 percent slope (Herman et al. 1979).

Climate in southern Illinois is continental with warm summers and mild winters. Thornthwaite (1948) considered the climate to be humid mesothermal with little to no water deficit in any season and a potential annual evapotranspiration of 76.2 cm. Average yearly precipitation in Carbondale is 113.5 cm, with extremes of 78.1 and 189.2 cm, and is evenly distributed throughout the year, although extended periods of drought can occur during the summer months. The mean January temperature is 2 °C while the mean July temperature is 25 °C at Carbondale. The average number of frost free days ranges from 193 to 206, extending between 7 April and 30 October (Herman et al. 1979).

METHODS

The flora of Thompson Woods was surveyed from May 1999 to August 2001 to collect voucher specimens and abundance information for each species. Special attention was given to areas with high species richness such as the forest edge and margins of paths. Voucher specimens were deposited at the Illinois Natural History Survey Herbarium (ILLS). Identifications, along with criteria for plant duration, were made using Fernald (1950), Radford et al. (1968), Mohlenbrock (1986), Gleason and Cronquist (1991), Swink and Wilhelm (1994), and Yatzkievych (1999). Nomenclature follows Mohlenbrock (1986).

Abundance ratings were defined to give a relative quantification to field observations and were modified from Lortie et al. (1991), Looney et al. (1993), Joyner and Chester (1994),

and Basinger and Robertson (1997). Abundance rating refers to abundance of a species within Thompson Woods and included: 1) abundant, species dominant throughout the woods, 2) frequent, species co-dominant or present in large numbers throughout the woods, 3) occasional, species in moderate numbers in scattered populations in the woods, 4) infrequent, species in small numbers in scattered populations in the woods, and 5) rare, species known from one individual, population, or a restricted area in the woods.

Plant life form (chamaephyte, cryptophyte, hemicryptophyte, phanerophyte, therophyte; Raunkiaer 1934) was determined for each species using information in Ennis (1928), MacDonald (1937), Oosting (1942), Hansen (1952), Gibson (1961), and Baskin et al. (1995). The predominant life cycle (annual, biennial, perennial) was determined using the above identification sources. Graminoids included Cyperaceae, Juncaceae, and Poaceae, while forbs included all non-woody and non-graminoid vascular plants. Woody plants included all trees, shrubs, and lianas, while ferns and fern allies were listed as pteridophytes.

Photosynthetic pathway (C_3/C_4) was determined from published information in Downtown (1975), Raghavendra and Das (1978), Waller and Lewis (1979), and Baskin et al. (1995). Photosynthetic pathway was inferred at the family or genus level using the above references for species whose pathway had not been determined. Woody plants were assumed to have the C_3 pathway, following Baskin et al. (1995).

RESULTS AND DISCUSSION

The flora of Thompson Woods consists of 338 species and subspecific taxa in 223 genera of 88 families. The Coniferophyta and Pteridophyta were poorly represented, accounting for only 4 species (1.2% of all species) and 8 species (2.4 %), respectively. Among angiosperms, monocots accounted for 71 species in 41 genera of 9 families (21.0%), whereas dicots accounted for 255 species in 171 genera of 73 families (75.4%). The families with the largest numbers of species were Asteraceae (28), Poaceae (28), Cyperaceae (17), Fagaceae (15), Rosaceae (13), and Lamiaceae (10). The genera with the largest numbers of species were *Carex* (17), *Quercus* (14), *Viburnum* (6), *Acer* (5), *Polygonum* (5), *Carya* (4), *Galium* (4), and *Solidago* (4). Genera with 3 species included *Aster*, *Cornus*, *Dichanthelium*, *Elymus*, *Euonymus*, *Eupatorium*, *Festuca*, *Ilex*, *Magnolia*, *Plantago*, *Poa*, *Prunus*, *Ranunculus*, *Ulmus*, and *Viola*. Appendix 1 provides a listing of all species reported from Thompson Woods in this study.

The flora of Thompson Woods was dominated by woody plants (115 species; 34.0% of all species) and C_3 perennial forbs (103 species; 30.5%). There were 169 forbs, 115 woody plants, 46 graminoids, and 8 pteridophytes. The majority of the species were perennial (267), followed by annual (58) and biennial (13). The predominant photosynthetic pathway was C_3 (330 species; 97.6% of all species). There were only 8 species (2.4%), 7 of these members of the Poaceae, that had the C_4 photosynthetic pathway (Table 1).

Life forms of the 338 species identified from Thompson Woods are as follows: hemicryptophyte (131 species; 38.8% of all species), phanerophyte (115 species; 34.0%), therophyte (57 species; 16.9%), cryptophyte (33 species; 9.8%), and chamaephyte (2 spe-

cies; 0.6%). It is well documented that hemicryptophytes dominate the flora of North America (MacDonald 1937, Oosting 1942, Hansen 1952, Gibson 1961).

Abundance ratings of the Thompson Woods flora indicate that 9 species (2.7% of all species) are abundant, 21 species (6.2%) are frequent, 33 species (9.8%) are occasional, 122 species (36.1%) are infrequent, and 153 species (45.3%) are rare. Other floristic surveys in Illinois that include abundance information indicate that most species within a defined area are either infrequent (=uncommon) or rare (Basinger and Robertson 1997, Edgin and Ebinger 2001).

Using the natural community classification system of White and Madany (1978), Thompson Woods would be classified as dry-mesic upland forest. *Quercus velutina*, *Q. falcata* Michx., and *Q. stellata* Wangh. prior to the two severe windstorms dominated this forest in 1980 (Faulkner 1983, O'Malley 1993). *Acer saccharum* Marsh., *Fagus grandifolia* Ehrh., and *Prunus serotina* Ehrh. in the overstory, *Lonicera maackii* in the sapling stratum, and *Euonymus fortunei*, *Eupatorium rugosum* Houtt., *Lonicera japonica*, *Parthenocissus quinquefolia* (L.) Planch., *Podophyllum peltatum* L. and *Toxicodendron radicans* (L.) Kuntze in the ground layer currently dominate the forest. It is hoped that this baseline study will be used to examine how the flora of Thompson Woods changes in response to management practices and continued planting efforts.

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LITERATURE CITED

- Basinger, M.A. and P.A. Robertson. 1997. Vascular flora of an old-growth forest remnant in the Ozark Hills of southern Illinois - updated results. *Transactions of the Illinois State Academy of Science* 90: 1-20.
- Baskin, J.M., D.H. Webb, and C.C. Baskin. 1995. A floristic plant ecology study of the limestone glades of northern Alabama. *Bulletin of the Torrey Botanical Club* 122: 226-242.
- Downtown, W.J.S. 1975. The occurrence of C₄ photosynthesis among plants. *Photosynthetic* 9: 96-105.
- Edgin, B. and J.E. Ebinger. 2001. Vascular flora of the Red Hills State Park, Lawrence County, Illinois. *Transactions of the Illinois State Academy of Science* 94: 1-17.
- Ennis, B. 1928. The life-forms of Connecticut plants and their significance in relation to climate. *Connecticut State Geological & Natural History Survey Bulletin* 43.
- Faulkner, J. 1983. Letter to John Guyon, Southern Illinois University at Carbondale. Illinois Nature Preserves Commission, Springfield.
- Fernald, M.L. 1950. *Gray's manual of botany*. 8th edition, American Book Company, New York.
- Gibson, D. 1961. The life-forms of Kentucky flowering plants. *The American Midland Naturalist* 66: 1-60.

- Gleason, H.A. and A. Cronquist. 1991. Manual of vascular plants of northeastern United States and adjacent Canada. 2nd edition, The New York Botanical Garden, Bronx.
- Hansen, C.E. 1952. The life-forms of the flowering plants of Illinois. Master's Thesis, Northwestern University, Evanston.
- Herman, R.J., C.C. Miles, L.A. Dungan, B.E. Currie, and P.W. Ice. 1979. Soil survey of Jackson County, Illinois. United States Department of Agriculture, Soil Conservation Service and Forest Service in cooperation with Illinois Agricultural Experiment Station.
- Joyner, J.M. and E.W. Chester. 1994. The vascular flora of Cross Creeks National Wildlife Refuge, Stewart County, Tennessee. *Castanea* 59: 117-145.
- Looney, P.B., D.J. Gibson, A. Blyth, and M.I. Cousens. 1993. Flora of the Gulf Islands National Seashore, Perdido Key, Florida. *Bulletin of the Torrey Botanical Club* 120: 327-341.
- Lortie, J.P., B.A. Sorrie, and D.W. Holt. 1991. Flora of the Monomoy Islands, Chatham, Massachusetts. *Rhodora* 93: 361-389.
- MacDonald, E.S., Sr. 1937. The life-forms of the flowering plants of Indiana. *The American Midland Naturalist* 18: 687-773.
- Mohlenbrock, R.H. 1986. Guide to the vascular flora of Illinois. Southern Illinois University Press, Carbondale.
- O'Malley, J. 1993. Can they save our woods? *Southern Alumnus* (Spring) 16-19.
- Oosting, H.J. 1942. An ecological analysis of the plant communities of Piedmont, North Carolina. *The American Midland Naturalist* 28: 1-126.
- Radford, A.E., H.E. Ahles, and C.R. Bell. 1968. Manual of the vascular flora of the Carolinas. University of North Carolina Press, Chapel Hill.
- Raghavendra, A.S. and V.S.R. Das. 1978. The occurrence of C₄ photosynthesis: a supplementary list of C₄ plants reported during the late 1974-mid 1977. *Photosynthetica* 12: 200-208.
- Raunkiaer, C. 1934. The life forms of plants and statistical plant geography. Clarendon Press, Oxford.
- Schwegman, J.E., G.D. Fell, M.D. Hutchison, G. Paulson, W.M. Shepherd, and J. White. 1973. Comprehensive plan for the Illinois Nature Preserves System. Part II - The natural divisions of Illinois. Illinois Department of Conservation, Nature Preserves Commission, Springfield.
- Swink, F. and G. Wilhelm. 1994. Plants of the Chicago Region. 4th Edition, Indiana Academy of Science, Indianapolis.
- Thorntwaite, C.W. 1948. An approach toward a rational classification of climate. *Geological Review* 39: 55-94.
- Waller, S.S. and J.K. Lewis. 1979. Occurrence of C₃ and C₄ photosynthetic pathways in North American grasses. *Journal of Range Management* 32: 12-28.
- White, J. and M.H. Madany. 1978. Classification of natural communities in Illinois. Appendix 30, pages 309-405 in J. White (ed.), Illinois Natural Areas Inventory Technical Report, Volume 1; Survey methods and results. Illinois Department of Conservation, Springfield.
- Yatskievych, G. 1999. Steyermark's flora of Missouri. Volume 1, the Missouri Department of Conservation, Jefferson City, Missouri, in cooperation with the Missouri Botanical Garden Press, St. Louis, Missouri.

Appendix 1. The flora of Thompson Woods is arranged alphabetically by family, genus, and species within each specific phylum. Common name [following Mohlenbrock (1986) and Swink and Wilhelm (1994)], an abundance statement (A = abundant, F = frequent, O = occasional, I = infrequent, R = rare), life form (Ch = chamaephyte, Cr = cryptophyte, H = hemicryptophyte, Ph = phanerophyte, Th = therophyte), photosynthetic pathway, and collection number are listed for each species after the binomial and authority.

PHYLUM PTERIDOPHYTA

ASPLENIACEAE

- Asplenium platyneuron* (L.) Oakes Ebony spleenwort. R, H, C₃, 11816.
Cystopteris protrusa (Weatherby) Blasd. Fragile fern. R, Cr, C₃, 12369.
Dryopteris marginalis (L.) Gray Marginal wood fern. R, H, C₃, 11828.
Onoclea sensibilis L. Sensitive fern. R, Cr, C₃, 12370.
Polystichum acrostichoides (Michx.) Schott Christmas fern. R, H, C₃, 12052.

OPHIOGLOSSACEAE

- Botrychium dissectum* Spreng. var. *obliquum* (Muhl.) Clute Grape fern. R, Cr, C₃, 12574.
Botrychium virginianum (L.) Sw. Rattlesnake fern. I, Cr, C₃, 12358.
Ophioglossum vulgatum L. var. *pycnostichum* Fern. Adder's tongue fern. R, Cr, C₃, 12218.

PHYLUM CONIFEROPHYTA

CUPRESSACEAE

- Juniperus virginiana* L. Red cedar. I, Ph, C₃, 11912.

GINGKOACEAE

- Ginkgo biloba* L. Ginkgo. R, Ph, C₃, 11857.

PINACEAE

- Tsuga canadensis* Mill. Eastern hemlock. R, Ph, C₃, 12295.

TAXACEAE

- Taxus cuspidata* Sieb. & Zucc. Japanese yew. R, Ph, C₃, 11969.

PHYLUM ANTHOPHYTA: LILIOPSIDA

ARACEAE

- Arisaema dracontium* (L.) Schott Green dragon. F, Cr, C₃, 11800.
Arisaema triphyllum (L.) Schott Jack-in-the-pulpit F, Cr, C₃, 11801.
Arum italicum L. Italian arum. I, Cr, C₃, 11931.

COMMELINACEAE

- Commelina communis* L. Common dayflower. I, Th, C₃, 11805.
Tradescantia virginiana L. Spiderwort. R, H, C₃, 12190A.

CYPERACEAE

- Carex annectens* Bickn. Large yellow fox sedge. R, H, C₃, 11939.
Carex artitecta Mack. Blunt-scaled oak sedge. I, H, C₃, 11845.
Carex blanda Dewey Common wood sedge. O, H, C₃, 11844.
Carex cephalophora Willd. Short-headed bracted sedge. I, H, C₃, 11832.
Carex conjuncta Boott Green-headed fox sedge. R, H, C₃, 11822.

- Carex festucacea* Willd. Fescue oval sedge. R, H, C₃, 12220.
Carex frankii Kunth Bristly cattail sedge. R, H, C₃, 11928.
Carex glaucoidea Tuckerm. Blue sedge. O, H, C₃, 11839.
Carex granularis Muhl. Pale sedge. I, H, C₃, 11897.
Carex grisea Steud. Wood gray sedge. I, H, C₃, 11920.
Carex hirsutella Mack. Hairy green sedge. I, Cr, C₃, 11853.
Carex jamesii Schwein. Grass sedge. I, H, C₃, 11827.
Carex pendula Hudson Drooping sedge. R, H, C₃, 11960.
Carex retroflexa Willd. Reflexed sedge. I, H, C₃, 11877.
Carex rosea Willd. Straight-styled wood sedge. I, H, C₃, 11919.
Carex shortiana Dewey Short's sedge. R, H, C₃, 11925.
Carex vulpinoidea Michx. Brown fox sedge. R, Cr, C₃, 11930.

DIOSCOREACEAE

- Dioscorea batatas* Dcne. Chinese yam. O, Cr, C₃ 11804.
Dioscorea quaternata (Walt.) J.F. Gmel. Wild yam. R, Cr, C₃, 12360.

IRIDACEAE

- Sisyrinchium angustifolium* Mill. Blue-eyed grass. I, H, C₃, 11873.

JUNCACEAE

- Juncus tenuis* Willd. Path rush. I, H, C₃, 11821.

LILIACEAE

- Allium canadense* L. Wild onion. I, Cr, C₃, 12209.
Allium vineale L. Field garlic. I, Cr, C₃, 11898.
Erythronium albidum Nutt. White trout lily. I, Cr, C₃, 12184A. *Hemerocallis fulva* L.
 Orange day lily. I, Cr, C₃, 12310.
Narcissus sp. Daffodil. I, Cr, C₃, not collected.
Polygonatum biflorum (Walt.) Ell. Solomon's seal. R, Cr, C₃, 11830.
Smilacina racemosa (L.) Desf. Solomon's plume. R, Cr, C₃, 11861.
Trillium flexipes Raf. White trillium. R, Cr, C₃, not collected.
Trillium recurvatum Beck Red trillium. I, Cr, C₃, 11810.

POACEAE

- Agrostis perennans* (Walt.) Tuckerm. Upland bent grass. I, H, C₃, 12023.
Agrostis stolonifera L. Red top. R, H, C₃, 11963.
Bromus pubescens Muhl. Woodland brome grass. I, H, C₃, 11841.
Chasmanthium latifolium (Michx.) Yates Sea oats. R, Cr, C₃, 11947.
Cinna arundinacea L. Stout wood reed. I, H, C₃, 12008.
Dactylis glomerata L. Orchard grass. R, H, C₃, 12002.
Danthonia spicata (L.) Roem. & Schult. Poverty oat grass. I, H, C₃, 11872.
Dichanthelium acuminatum (Sw.) Gould & Clark var. *fasciculatum* (Torr.) Freckm.
 Panic grass. I, H, C₃, 11837.
Dichanthelium boscii (Poir.) Gould Large-fruited panic grass. R, H, C₃, 11881.
Dichanthelium laxiflorum (Lam.) Gould Panic grass. R, H, C₃, 12016.
Digitaria sanguinalis (L.) Scop. Crabgrass. R, Th, C₄, 12004.
Eleusine indica (L.) Gaertn. Goose grass. R, Th, C₄, 12003.
Elymus hystrix L. Bottlebrush grass. R, H, C₃, 11949.
Elymus villosus Muhl. Hairy wild rye. R, H, C₃, 11948.
Elymus virginicus L. Virginia wild rye. O, H, C₃, 11843.
Eragrostis capillaris (L.) Nees Lace grass. R, Th, C₄, 12050.
Festuca arundinacea Schrad. Tall fescue. I, H, C₃, 11905, 12216.

- Festuca obtusa* Biehler Nodding fescue. I, H, C₃, 11887.
Festuca rubra L. Red fescue. R, H, C₃, 12221.
Glyceria striata (Lam.) Hitchc. Fowl manna grass. O, H, C₃, 11846.
Leersia virginica Willd. White grass. I, H, C₃, 12054.
Muhlenbergia schreberi J.F. Gmel. Nimble will. I, H, C₄, 12055.
Poa annua L. Annual bluegrass. I, Th, C₃, 11809.
Poa pratensis L. Kentucky bluegrass. I, H, C₃, 11836.
Poa sylvestris Gray Woodland bluegrass. I, H, C₃, 11922.
Setaria viridis (L.) Beauv. Green foxtail. I, Th, C₄, 12005.
Sphenopholis obtusata (Michx.) Scribn. Wedge grass. R, H, C₃, 11867.
Tridens flavus (L.) Hitchc. Purple top. R, H, C₄, 12007.

SMILACACEAE

- Smilax glauca* Walt. Glauous catbrier. R, Ph, C₃, 12312.
Smilax hispida Muhl. Bristly catbrier. I, Ph, C₃, 11915.

PHYLUM ANTHOPHYTA: MAGNOLIOPSIDA

ACERACEAE

- Acer negundo* L. Box-elder. F, Ph, C₃, 11886.
Acer platanoides Thunb. Norway maple. R, Ph, C₃, 12286.
Acer rubrum L. Red maple. R, Ph, C₃, 11835.
Acer saccharinum L. Silver maple. I, Ph, C₃, 11825.
Acer saccharum Marsh. Sugar maple. A, Ph, C₃, 11824.

AMARANTHACEAE

- Amaranthus spinosus* L. Spiny pigweed. R, Th, C₄, 12577.

ANACARDIACEAE

- Cotinus coggygria* Scop. Smoke-tree. R, Ph, C₃, 12012.
Rhus aromatica L. Aromatic sumac. I, Ph, C₃, 11806.
Rhus copallina L. Winged sumac. I, Ph, C₃, 11904.
Toxicodendron radicans (L.) Kuntze Poison ivy. A, Ph, C₃, 11923.

ANNONACEAE

- Asimina triloba* (L.) Dunal Pawpaw. O, Ph, C₃, 11952.

APIACEAE

- Cryptotaenia canadensis* (L.) DC. Honewort. F, H, C₃, 11829.
Daucus carota L. Queen Anne's lace. I, H, C₃, 11967.
Osmorhiza longistylis (Torr.) DC. Sweet cicely. R, H, C₃, 12356.
Sanicula canadensis L. Canadian black snakeroot. F, H, C₃, 11834.
Sanicula gregaria Bickn. Common snakeroot. I, H, C₃, 11899.

APOCYNACEAE

- Apocynum cannabinum* L. Indian hemp. I, H, C₃, 11953.
Vinca minor L. Periwinkle. R, Ch, C₃, 12201.

AQUIFOLIACEAE

- Ilex decidua* Walt. Deciduous holly. I, Ph, C₃, 11818.
Ilex opaca L. American holly. I, Ph, C₃, 11958.
Ilex verticillata L. Winterberry. R, Ph, C₃, 11954.

ARALIACEAE

- Aralia spinosa* L. Devil's walking-stick. R, Ph, C₃, 11998, 12333.
Hedera helix L. English ivy. R, Ph, C₃, 12314.
Panax quinquefolius L. Ginseng. R, Cr, C₃, 12367.

ARISTOLOCHIACEAE

- Aristolochia serpentaria* L. Virginia snakeroot. R, Cr, C₃, 12315.
Asarum canadense L. var. *reflexum* (Bickn.) Robins. Wild ginger. I, H, C₃, 11812.

ASCLEPIADACEAE

- Asclepias purpurascens* L. Purple milkweed. R, H, C₃, 12368.

ASTERACEAE

- Ambrosia artemisiifolia* L. Common ragweed. I, Th, C₃, 12060.
Ambrosia trifida L. Giant ragweed. I, Th, C₃, 12059.
Aster lateriflorus (L.) Britt. Side-flowered aster. I, H, C₃, 12304.
Aster pilosus Willd. Hairy aster. R, H, C₃, 12118.
Aster simplex Willd. Panicked aster. I, H, C₃, 12363.
Bidens bipinnata L. Spanish needles. R, Th, C₃, 12061.
Cirsium discolor (Muhl.) Spreng. Field thistle. R, H, C₃, 12305.
Conyza canadensis (L.) Cronq. Horseweed. I, Th, C₃, 12068, 12120.
Eclipta prostrata (L.) L. Yerba-de-tajo. R, Th, C₃, 12057.
Erechtites hieracifolia (L.) Raf. Fireweed. I, Th, C₃, 12117.
Erigeron annuus (L.) Pers. Daisy fleabane. F, Th, C₃, 11889.
Erigeron philadelphicus L. Marsh fleabane. F, Th, C₃, 11878.
Eupatorium coelestinum L. Mistflower. R, H, C₃, 12071.
Eupatorium rugosum Houtt. White snakeroot. A, H, C₃, 12020.
Eupatorium serotinum Michx. Late boneset. I, H, C₃, 12070.
Lactuca canadensis L. Wild lettuce. I, H, C₃, 12056.
Lactuca floridana (L.) Gaertn. Woodland lettuce. I, H, C₃, 12351.
Leucanthemum vulgare Lam. R, H, C₃, 11940.
Senecio glabellus Poir. Butterweed. O, Th, C₃, 11880.
Solidago caesia L. Woodland goldenrod. R, H, C₃, 12316.
Solidago canadensis L. Tall goldenrod. I, H, C₃, 12119.
Solidago nemoralis Ait. Old-field goldenrod. R, H, C₃, 12124.
Solidago ulmifolia Muhl. Elm-leaved goldenrod. R, H, C₃, 12306.
Sonchus asper Hill Spiny sow thistle. I, Th, C₃, 11970.
Taraxacum laevigatum Weber Red-seeded dandelion. I, H, C₃, 11921.
Taraxacum officinale Weber Common dandelion. I, H, C₃, 11855.
Verbesina alternifolia L. Yellow ironweed. I, H, C₃, 12011.
Vernonia missurica Raf. Missouri ironweed. R, H, C₃, 12362.

BALSAMINACEAE

- Impatiens capensis* Meerb. Jewelweed. F, Th, C₃, 11941.

BERBERIDACEAE

- Berberis thunbergii* Thunb. Japanese barberry. R, Ph, C₃, 12317.
Podophyllum peltatum L. Mayapple. A, Cr, C₃, 11803.

BETULACEAE

- Betula nigra* L. River birch. I, Ph, C₃, 11924.

BIGNONIACEAE

- Campsis radicans* (L.) Seem. Trumpet creeper. F, Ph, C₃, 12287.
Catalpa speciosa (L.) Warder Catalpa. R, Ph, C₃, 12334.

BORAGINACEAE

- Buglossoides arvensis* (L.) I.M. Johnston Corn gromwell. R, Th, C₃, 11900.
Hackelia virginiana (L.) I.M. Johnston Stickseed. I, H, C₃, 12058.
Mertensia virginica L. Virginia bluebells. R, H, C₃, 12189.

Myosotis macrosperma Engelm. Scorpion grass. I, Th, C₃, 11831.

BRASSICACEAE

Allaria petiolata (Bieb.) Cavara & Grande Garlic mustard. R, H, C₃, 11850.

Arabidopsis thaliana (L.) Heynh. Mouse-ear cress. R, Th, C₃, 12192.

Arabis laevigata (Muhl.) Poir. Smooth rock cress. R, H, C₃, 11819.

Barbarea vulgaris R. Br. var. *arcuata* (Opiz) Fr. Winter cress. R, H, C₃, 11871.

Cardamine hirsuta L. Bitter cress. I, Th, C₃, 11903, 12199.

Dentaria laciniata Muhl. Toothwort. I, Cr, C₃, 12184.

Draba brachycarpa Nutt. Short-fruited whitlow grass. R, Th, C₃, 12191.

Eriophila verna (L.) Chev. Vernal whitlow grass. R, Th, C₃, 12202A.

Lepidium virginicum L. Common peppergrass. R, H, C₃, 12018, 12288.

CAESALPINIACEAE

Cassia marilandica L. Maryland senna. R, H, C₃, 12064.

Cercis canadensis L. Redbud. F, Ph, C₃, 11847.

Gleditsia triacanthos L. Honey locust. I, Ph, C₃, 11911.

Gymnocladus dioica (L.) K. Koch Kentucky coffee-tree. I, Ph, C₃, 12331.

CALLITRICHACEAE

Callitriche terrestris Raf. Terrestrial starwort. O, Th, C₃, 11854.

CALYCANTHACEAE

Calycanthus floridus L. Strawberry bush. R, Ph, C₃, 12215.

CAMPANULACEAE

Lobelia inflata L. Indian tobacco. R, Th, C₃, 12014.

Triodanis biflora (Ruiz) Cav. Venus' looking glass. R, Th, C₃, 11929.

Triodanis perfoliata (L.) Nieuw. Venus' looking glass. I, Th, C₃, 11875.

CAPRIFOLIACEAE

Lonicera japonica Thunb. Japanese honeysuckle. A, Ph, C₃, 11874.

Lonicera maackii (Rupr.) Maxim. Amur honeysuckle. A, Ph, C₃, 11868.

Sambucus canadensis L. Elderberry. F, Ph, C₃, 11945.

Viburnum carlesii Hieml. Koreanspice viburnum. R, Ph, C₃, 12318.

Viburnum dentatum L. Southern arrowwood. I, Ph, C₃, 12357.

Viburnum opulus L. European highbush cranberry. I, Ph, C₃, 12289.

Viburnum recognitum Fern. Smooth arrowwood. R, Ph, C₃, 11890.

Viburnum rhytidophyllum Thunb. Leatherleaf viburnum. R, Ph, C₃, 11968.

Viburnum rufidulum Raf. Southern black haw. I, Ph, C₃, 11870.

CARYOPHYLLACEAE

Cerastium glomeratum Thuill. Clammy mouse-ear chickweed. R, Th, C₃, 12195A.

Cerastium vulgatum L. Common mouse-ear chickweed. R, H, C₃, 12219.

Holosteum umbellatum L. Jagged chickweed. R, Th, C₃, 12193.

Paronychia fastigiata (Ait.) Fern. Forked chickweed. R, Th, C₃, 12328.

Sagina decumbens (Ell.) Torr. & Gray Pearlwort. R, Th, C₃, 12194.

Silene stellata Ait. f. Starry campion. R, H, C₃, 12307.

Stellaria media (L.) Vill. Common chickweed. O, Th, C₃, 11876.

CELASTRACEAE

Celastrus scandens L. Bittersweet. R, Ph, C₃, 12320.

Euonymus alata Thunb. Winged euonymus. F, Ph, C₃, 11862.

Euonymus atropurpurea Jacq. Wahoo. R, Ph, C₃, 11866.

Euonymus fortunei (Turcz.) Hand.-Maz. Climbing euonymus. A, Ph, C₃, 12017, 12122.

CHENOPODIACEAE

- Chenopodium album* L. Lamb's quarters. R, Th, C₃, 12069.
Chenopodium gigantospermum Aellen Maple-leaved goosefoot. R, Th, C₃, 12575.

CORNACEAE

- Cornus drummondii* C.A. Mey. Rough-leaved dogwood. I, Ph, C₃, 12290.
Cornus florida L. Flowering dogwood. I, Ph, C₃, 11869.
Cornus obliqua Raf. Pale dogwood. R, Ph, C₃, 12024.

CORYLACEAE

- Carpinus caroliniana* Walt. Blue beech. R, Ph, C₃, 12001.
Corylus americana Walt. Hazelnut. I, Ph, C₃, 12321.
Ostrya virginiana (Mill.) K. Koch Hop hornbeam. R, Ph, C₃, 12000.

EBENACEAE

- Diospyros virginiana* L. Persimmon. O, Ph, C₃, 12319.

ELAEAGNACEAE

- Elaeagnus umbellata* Thunb. Autumn olive. I, Ph, C₃, 11932.

EUPHORBIACEAE

- Acalypha virginica* L. Three-seeded mercury. O, Th, C₃, 12013.
Poinsettia dentata (Michx.) Kl. & Garcke Wild poinsettia. R, Th, C₃, 12051.

FABACEAE

- Amphicarpaea bracteata* (L.) Fern. Hog peanut. R, Th, C₃, 12329.
Desmodium glabellum (Michx.) DC. Tick trefoil. R, H, C₃, 12308.
Desmodium paniculatum (L.) DC. Panicked tick trefoil. R, H, C₃, 12309.
Medicago lupulina L. Black medic. I, Th, C₃, 11893.
Melilotus alba L. White sweet clover. I, H, C₃, 11906.
Melilotus officinalis L. Yellow sweet clover. R, H, C₃, 11833.
Robinia pseudoacacia L. Black locust. I, Ph, C₃, 11934.
Trifolium repens L. White clover. I, H, C₃, 11865.

FAGACEAE

- Fagus grandifolia* Ehrh. var. *caroliniana* (Loud.) Fern. & Rehd. American beech. F, Ph, C₃, 11910.
Quercus alba L. White oak. O, Ph, C₃, 11908.
Quercus bicolor Willd. Swamp white oak. R, Ph, C₃, 12292.
Quercus coccinea Muenchh. Scarlet oak. R, Ph, C₃, 12371.
Quercus falcata Michx. Southern red oak. O, Ph, C₃, 12324.
Quercus imbricaria Michx. Shingle oak. I, Ph, C₃, 11909.
Quercus macrocarpa Michx. Bur oak. R, Ph, C₃, 12325.
Quercus pagoda Raf. Cherrybark oak. R, Ph, C₃, 12021.
Quercus palustris Muenchh. Pin oak. I, Ph, C₃, 12022.
Quercus prinoides Willd. var. *acuminata* (Michx.) Gl. Yellow chestnut oak. I, Ph, C₃, 11917.
Quercus prinus L. Rock chestnut oak. R, Ph, C₃, 12372.
Quercus rubra L. Red oak. I, Ph, C₃, 12291.
Quercus shumardii Buckley Shumard oak. R, Ph, C₃, 12373.
Quercus stellata Wangh. Post oak. I, Ph, C₃, 12578.
Quercus velutina Lam. Black oak. F, Ph, C₃, 12293.

GERANIACEAE

- Geranium carolinianum* L. Wild cranesbill. I, Th, C₃, 11884.

HAMAMELIDACEAE

Hamamelis virginiana L. Witch-hazel. R, Ph, C₃, 12217.

Liquidambar styraciflua L. Sweet gum. O, Ph, C₃, 11918.

HIPPOCASTANACEAE

Aesculus hippocastanum L. Horse chestnut. R, Ph, C₃, 11808.

Aesculus pavia L. Red buckeye. O, Ph, C₃, 11807.

HYDROPHYLLACEAE

Phacelia bipinnatifida Michx. Phacelia. O, H, C₃, 11857.

HYPERICACEAE

Hypericum punctatum Lam. Spotted St. John's wort. R, H, C₃, 12009, 12088.

JUGLANDACEAE

Carya laciniosa (Mill.) K. Koch Kingnut hickory. I, Ph, C₃, 12296.

Carya glabra (Mill.) Sweet Pignut hickory. I, Ph, C₃, 12374.

Carya ovata (Mill.) K. Koch Shagbark hickory. I, Ph, C₃, 11951.

Carya tomentosa (Poir.) Nutt. Mockernut hickory. I, Ph, C₃, 11959.

Juglans cinerea L. Butternut. R, Ph, C₃, 12375.

Juglans nigra L. Black walnut. I, Ph, C₃, 12332.

LAMIACEAE

Glechoma hederacea L. var. *micrantha* Mac. Ground ivy. I, H, C₃, 11864.

Hedeoma pulegioides (L.) Pers. American pennyroyal. I, Th, C₃, 12065.

Lamium amplexicaule L. Henbit. R, Th, C₃, 12196.

Lamium purpureum L. Purple dead nettle. O, Th, C₃, 12197.

Lycopus virginicus L. Bugle weed. I, H, C₃, 12063.

Monarda bradburiana Beck Wild bergamot. R, H, C₃, 11895.

Prunella vulgaris L. var. *elongata* Benth. Self-heal. I, H, C₃, 11848.

Pycnanthemum tenuifolium Schrader Slender mountain mint. R, H, C₃, 12094.

Salvia lyrata L. Cancer-weed. R, H, C₃, 11883.

Scutellaria incana Biehler Downy skullcap. R, H, C₃, 12355.

LAURACEAE

Lindera benzoin (L.) Blume Spicebush. R, Ph, C₃, 12335.

Sassafras albidum (Nutt.) Nees Sassafras. F, Ph, C₃, 11965.

MAGNOLIACEAE

Liriodendron tulipifera L. Tulip tree. O, Ph, C₃, 11942.

Magnolia grandiflora L. Southern magnolia. R, Ph, C₃, 12297.

Magnolia X soulangeana. Saucer magnolia. R, Ph, C₃, 12294.

Magnolia stellata Thunb. Star magnolia. R, Ph, C₃, 11890a, 12298.

MALVACEAE

Hibiscus laevis L. Halberd-leaved mallow. R, H, C₃, 12121.

Hibiscus syriacus L. Rose-of-sharon. I, Ph, C₃, 11972.

MENISPERMACEAE

Menispermum canadense L. Moonseed. I, Ph, C₃, 12376.

MIMOSACEAE

Albizzia julibrissin Duraz. Mimosa. R, Ph, C₃, 12576.

MORACEAE

Maclura pomifera (Raf.) Schneider Osage orange. O, Ph, C₃, 11943.

Morus alba L. White mulberry. O, Ph, C₃, 11823.

Morus rubra L. Red mulberry. O, Ph, C₃, 12299.

NYSSACEAE

Nyssa sylvatica Marsh. Black gum. I, Ph, C₃, 12327.

OLEACEAE

Forsythia viridissima Lindl. Forsythia. R, Ph, C₃, 12222.

Fraxinus americana L. White ash. F, Ph, C₃, 12300.

Fraxinus pennsylvanica Marsh. Green ash. I, Ph, C₃, 11817.

Ligustrum vulgare Thunb. Common privet. O, Ph, C₃, 11946.

ONAGRACEAE

Oenothera biennis L. Evening primrose. R, Th, C₃, 12067.

OXALIDACEAE

Oxalis dillenii Jacq. Yellow wood sorrel. I, H, C₃, 11838.

Oxalis stricta L. Yellow wood sorrel. O, H, C₃, 11858.

PAPAVERACEAE

Corydalis flavula (Raf.) DC. Pale corydalis. O, Th, C₃, 12198.

Dicentra cucullaria (Raf.) Bernh. Dutchman's breeches. R, Cr, C₃, 12187.

Sanguinaria canadensis L. Bloodroot. R, Cr, C₃, 11962.

PASSIFLORACEAE

Passiflora incarnata L. Large passion-flower. R, H, C₃, 12353.

Passiflora lutea L. var. *glabriflora* Fern. Small passion-flower. R, H, C₃, 12019.

PHILADELPHACEAE

Philadelphus coronarius L. Mock-orange. I, Ph, C₃, 12322.

PHRYMACEAE

Phryma leptostachya L. Lopseed. R, H, C₃, 12364.

PHYTOLACCACEAE

Phytolacca americana L. Pokeweed. F, Cr, C₃, 11937.

PLANTAGINACEAE

Plantago lanceolata L. English plantain. R, H, C₃, 11966.

Plantago rugelii Dcne. Rugel's plantain. I, H, C₃, 11938.

Plantago virginica L. Dwarf plantain. R, Th, C₃, 11927.

PLATANACEAE

Platanus occidentalis L. Sycamore. O, Ph, C₃, 12301.

POLEMONIACEAE

Phlox divaricata L. ssp. *laphamii* (Wood) Wherry Woodland phlox. R, Ch, C₃, 12359.

Polemonium reptans L. Jacob's ladder. R, H, C₃, 11896.

POLYGONACEAE

Polygonum cespitosum Blume var. *longisetum* (DeBruyn) Stewart Creeping Smartweed.
I, Th, C₃, 11863.

Polygonum cuspidatum Thunb. Japanese knotweed. I, H, C₃, 11885.

Polygonum punctatum Ell. Spotted smartweed. I, Th, C₃, 12015.

Polygonum scandens L. Climbing buckwheat. O, H, C₃, 12066, 12125.

Polygonum virginianum L. Virginia knotweed. I, H, C₃, 12311.

Rumex crispus L. Curly dock. R, H, C₃, 11891.

Rumex obtusifolius L. Large-leaved dock. I, H, C₃, 11820.

PORTULACACEAE

Claytonia virginica L. Spring beauty. I, Cr, C₃, 12186.

PRIMULACEAE

Samolus valerandii L. Brookweed. R, H, C₃, 12361.

RANUNCULACEAE

- Anemone virginiana* L. Thimbleweed. R, H, C₃, 11956.
Aquilegia canadensis L. Wild columbine. R, H, C₃.
Delphinium tricorne Michx. Larkspur. R, H, C₃, 12185.
Hydrastis canadensis L. Goldenseal. R, Cr, C₃, 12366.
Ranunculus abortivus L. Small-flowered buttercup. O, H, C₃, 11842.
Ranunculus micranthus Nutt. Buttercup. R, H, C₃, 12202.
Ranunculus recurvatus Poir. Buttercup. R, H, C₃, 11849.

ROSACEAE

- Crataegus pruinosa* (Wendl.) K. Koch Hawthorn. R, Ph, C₃, 11935.
Duchesnea indica (Andr.) Focke Indian strawberry. I, H, C₃, 11907, 12195.
Geum canadense Jacq. White avens. F, H, C₃, 11964.
Geum vernum (Raf.) Torr. & Gray Spring avens. I, H, C₃, 11888.
Malus pumila Mill. Apple. R, Ph, C₃, 12200.
Malus sp. Crabapple. R, Ph, C₃, 11950.
Potentilla simplex Michx. Common cinquefoil. R, H, C₃, 12330.
Prunus cerasus L. O, Ph, C₃, 1894.
Prunus nigra L. I, Ph, C₃, not collected.
Prunus serotina Ehrh. Black cherry. A, Ph, C₃, 11826.
Rosa multiflora Thunb. Multiflora rose. I, Ph, C₃, 11913.
Rubus occidentalis L. Black raspberry. I, H, C₃, 11914.
Rubus pensilvanicus Poir. Common blackberry. F, H, C₃, 11859, 11916.

RUBIACEAE

- Galium aparine* L. Goosegrass. F, Th, C₃, 11892.
Galium circaeazans Michx. Wild licorice. I, H, C₃, 11902.
Galium obtusum Michx. Wild madder. R, H, C₃, 11882.
Galium triflorum Michx. Sweet-scented bedstraw. R, H, C₃, 12365.
Hedyotis longifolia var. *ciliolata* Long-leaved bluets. R, H, C₃, 11901.

SAPINDACEAE

- Koelreuteria paniculata* Laxm. Yellow-chain tree. R, Ph, C₃, 11999.

SCROPHULARIACEAE

- Gratiola neglecta* Torr. Clammy hedge hyssop. I, Th, C₃, 11879.
Mimulus alatus Ait. Winged monkey-flower. R, H, C₃, 12062.
Paulownia tomentosa Thunb. Princess tree. R, Ph, C₃, 12323.
Penstemon digitalis Torr. Foxglove beardstongue. R, H, C₃, 11860.
Verbascum thapsus L. Woolly mullein. R, H, C₃, 12352.
Veronica arvensis L. Corn speedwell. I, Th, C₃, 11815.
Veronica peregrina L. White speedwell. I, Th, C₃, 11840.

SOLANACEAE

- Physalis heterophylla* Nees Clammy ground cherry. R, Cr, C₃, 12123.
Solanum ptycanthum Dunal Black nightshade. I, Th, C₃, 12053.

STYRACACEAE

- Halesia carolina* L. Carolina silverbell. R, Ph, C₃, 12188.

TILIACEAE

- Tilia americana* L. Basswood. R, Ph, C₃, 12376.

ULMACEAE

- Celtis laevigata* Willd. Sugarberry. I, Ph, C₃, 11926.
Celtis occidentalis L. Hackberry. O, Ph, C₃, 11933.

Ulmus alata Michx. Winged elm. O, Ph, C₃, 12354.
Ulmus americana L. American elm. F, Ph, C₃, 12302.
Ulmus rubra Muhl. Slippery elm. I, Ph, C₃, 12303.

URTICACEAE

Boehmeria cylindrica (L.) Sw. False nettle. I, Cr, C₃, 12006.
Parietaria officinalis L. Erect pellitory-of-the wall. R, H, C₃, 11920A.
Parietaria pensylvanica Muhl. Pellitory. I, Th, C₃, 11814.
Pilea pumila (L.) Gray Clearweed. I, Th, C₃, 12326.

VALERIANACEAE

Valerianella radiata (L.) Dufur. Corn salad. I, Th, C₃, 11936.

VERBENACEAE

Verbena urticifolia L. White vervain. R, H, C₃, 12010.

VIOLACEAE

Hybanthus concolor (Spreng.) T.F. Forst. Green violet. R, H, C₃, 11852.
Viola pubescens Ait. var. *eriocarpa* (Schwein.) Russell Yellow violet. I, H, C₃, 11811.
Viola rafinesquii Greene Johnny jump-up. R, Th, C₃, 12190.
Viola sororia Willd. Hairy blue violet. O, H, C₃, 11813.

VITACEAE

Ampelopsis cordata Michx. Raccoon grape. I, Ph, C₃, 11944.
Parthenocissus quinquefolia (L.) Planch. Virginia creeper. A, Ph, C₃, 11955.
Vitis cinerea Engelm. Winter grape. O, Ph, C₃, 11957.
Vitis vulpina L. Frost grape. O, Ph, C₃, 11961.

Table 1. Summary of growth forms in the flora of Thompson Woods, Jackson County, Illinois.

Growth Form	Annual	Biennial	Perennial
C ₃ Graminoid	1	-	39
C ₄ Graminoid	4	-	2
C ₃ Forb	52	13	103
C ₄ Forb	1	-	-
Woody	-	-	115
Pteridophyte	-	-	8
Totals	58	13	267