

# THE GENUS *HYDROPHYLLUM* IN ILLINOIS

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## ABSTRACT

The genus *Hydrophyllum* L. (Hydrophyllaceae—Waterleaf Family) is made up of eight species in the United States which are indigenous to two disjunct areas. The western group consists of *H. capitatum* Dougl., *H. fendleri* (Gray) Heller, *H. occidentale* (Watson) Gray, and *H. tenuipes* Heller (Beckman, 1979).

The genus in Illinois is composed of the four eastern species. They are *H. appendiculatum* Michx., *H. canadense* L., *H. macrophyllum* Nutt., and *H. virginianum* L. Descriptions of the taxa and their habitats are given. A key to the taxa is provided after thorough examination of 938 specimens.

## INTRODUCTION

Besides the genus *Hydrophyllum*, three other genera of the family occur in Illinois. The genus *Hydrolea* L. is represented by one species, *H. uniflora* Raf. The genus *Ellisia* L. is also represented by one species, *E. nyctelea* L. *Phacelia* Juss. has three species, *P. purshii* Buckley, *P. ranunculacea* (Nutt.) Constance, and *P. bipinnatifida* Michx. The characteristics used to distinguish these genera are: presence or absence of axillary spines, opposite or alternate cauline leaves, entire or fimbriate corolla lobes, and glandular-pubescent or eglandular-pubescent inflorescence branches.

This taxonomic study was performed because of the need to better clarify and distinguish the species of *Hydrophyllum* as they occur in Illinois. The literature review produced little previous work on this genus in Illinois or surrounding states. Shields (1966) wrote descriptions, keys, and distribution maps for the members of the family as they occur in Wisconsin. Morgan (1971) studied the phenology, photosynthesis and respiration, microenvironments, seed characteristics and germination, reproduction and mortality of a *H. appendiculatum* community in Brownfield Woods near Urbana, Illinois. Beckman (1979) studied the biosystematics of the genus *Hydrophyllum*. Cox, et al. (1972) described the succession and composition of a central Illinois prairie grove in which *H. canadense* was designated as a dominant herb.

## DESCRIPTION OF THE GENUS

Erect, mostly perennial, mostly hairy herbs, with fleshy-fibrous roots from a well developed rhizome; leaves alternate, simple, entire to compound, long-petioled, pinnately or palmately divided; flowers in compact, peduncled, cymose clusters, lacking bracts and a well developed main axis; corolla bluish-purple.

Flowers 5-merous; calyx sometimes with a small appendage in each sinus, the lobes subulate; corolla broadly tubular to rotate, campanulate, purple, usually

lobed to about the middle, the lobes convolute in the bud; stamens borne on the corolla tube, alternating with the lobes; stamens and styles mostly exserted; filaments more or less bearded; style 1- and  $\pm$  2-cleft, or styles 2; ovary bristly-hairy, superior, 1- to 2-celled, with few-many ovules on parietal to axile placentae; placentae thick and fleshy, connected with the pericarp at the base and apex; fruit a globose capsule, commonly 1-celled and 2-valved, ripening 1-4 seeds, the seeds spherical.

The dichotomous key provided below is an artificial one which will aid in field and herbarium identification. This key is designed for identification in the reproductive and vegetative states.

## KEY TO THE SPECIES OF HYDROPHYLLUM IN ILLINOIS

1. Uppermost leaves palmately lobed . . . . . 2
1. Uppermost leaves pinnately lobed or compound . . . . . 3
  2. Calyx with a short, usually reflexed appendage between the lobes; peduncles hirsute, the hairs over 1 mm long; leaves becoming increasingly dissected or compound toward the plant base . . . . . 1. *H. appendiculatum*
  2. Calyx without a short reflexed appendage, but rarely with a minute tooth between some of the lobes; peduncles sparsely pubescent, the hairs up to 1 mm long; leaves usually remaining palmately lobed all along the stem . . . . . 2. *H. canadese*
3. Main stem and peduncle hairs spreading at right angles from the stem, 1-2 mm long; leaves 9- to 13-parted, seldom glaucous underneath . . . . . 3. *H. macrophyllum*
3. Peduncle hairs antrorsely appressed, up to 1 mm long; leaves 3- to 7-parted, glaucous underneath . . . . . 4. *H. virginianum*

The following sections for each species include the binomial, author of the name, publication place and date of that species from Jones and Fuller (1955), and common name(s). A description of the species with some discussion of habitat and occurrence follows Mohlenbrock (1975). Finally the specimens examined are cited alphabetically by county.

1. *Hydrophyllum appendiculatum* Michx. Fl. Bor. Am. 1:134. 1803. Great Waterleaf, Woollen Breeches.

Taprooted biennial; stems 3-6 dm tall, hirsute, erect; cauline leaves palmately 5-lobed, truncate or V-shaped at the base; cyme loosely flowered; sepals separate nearly to the base, densely hirsute, alternating with conspicuous reflexed appendages; corolla purple; stamens and style exserted 1-3 mm.

This species grows in rich, moist woods and flowers during May and June. In Illinois this species is occasional in occurrence throughout the state. *Hydrophyllum appendiculatum* was first discovered and documented for Illinois by Mead (1846).

Reference was made to the different leaf shapes of *H. appendiculatum* in the preceding key. Morgan (1971) explains that the first-year plant germinating in the spring lives through the summer under a closed canopy and produces two to four erect, palmately shaped leaves. In the fall, mottled, palmately shaped leaves are produced which overwinter as a basal rosette. This species will not flower unless a

basal rosette has been produced in the fall. Morgan (1971) noted that the first-year leaves died back after heavy frosts. Early in the second spring season, the plants break dormancy and form a large basal rosette of pinnately shaped leaves. Later in the spring more erect palmately shaped leaves are formed. This biennial habit explains why different leaf types can be found on a specimen of *H. appendiculatum*.

Because *H. appendiculatum* differs from the other members of the genus by its biennial habits and its appendaged calyx lobes, it has been proposed to a separate genus, *Decemium* Raf., by Brand (1913) and Small (1933). However, Constance (1942) retained the species in the genus *Hydrophyllum* because its inflorescence, distribution, and habitat are so similar to the other members of the genus (Morgan, 1971).

### SPECIMENS EXAMINED:

ADAMS: Burton, Brinker 2556 (ILL, ILLS, ISM), 3376 (ILL, ILLS, ISM), 3400 (ILL, ISM), Evers 1146 (ILL); Burton Cave, Henry 2280 (WIU), 2305 (WIU); Quincy, Brinker 1151 (ILL). ALEXANDER: Ware, Bauer 2403 (F); McClure, Winterringer 7745 (ISM), Buser 5430 (ILL). BROWN: LaGrange, Rexroat 2661 (ISM); McKee Creek, Wickliffe s.n. (ISM). BUREAU: Neponset, Winterringer 7580 (ISM); Buda, Evers 95506 (ILL). CALHOUN: Batchtown, Evers 94066 (ILL); Hardin, Evers 53493 (ILL), Winterringer 15980 (ISM), 15981 (ISM), Koelling 2575 (ISM); Kampsville, Winterringer 20365 (ISM), 20412 (ISM). CARROLL: Mississippi Palisades State Park, Chase 5351 (ILL). CHAMPAIGN: University of Illinois, Jones 15058 (SIU); Urbana, Seigler, Hoffman, ( Moestrop 4038 (ILL), Jones 3213 (ILL), 11271 (ILL), 11677 (ILL), 12499 (ILL), 13671 (ILL), 15058 (ILL, ISM), 15061 (ILL, ISM), 16334 (ILL), McDougall s.m. (ILL), Gates 1575.1 (F), 2216 (ILL), 2308 (ILL), Winterringer 829 (ILL), J. S. R. 29679 (ILL), Honens s.n. (ILL), Ahles 1054 (ILL); Brownfield Woods, Atteberry s.n. (ILL). CHRISTIAN: Taylorville, DeMotte s.n. (ILL), Winterringer 7671 (ISM). CLARK: Westfield, Nyboer 95 (EIU). COLES: Fox Ridge State Park, Moore 15 (EIU), Thut s.n. (EIU), Ahles 3915 (ILL), Fuller 10062 (ISM), 10413 (ISM), Evers 22881 (ILL), 43058 (ILL) COOK: Willow Springs, Moffatt 159 (ILL); Spring Creek, Babcock s.n. (F); Edgebrook, Duesner s.n. (F). CRAWFORD: Palestine, Ebinger 15473 (EIU), Phillippe 220 (EIU), 248 (EIU), Evers 22495 (ILL), 29520 (ILL), 34676 (ILL), 43238 (ILL), 96481 (ILL); Oblong, Winterringer 14022 (ISM), 14023 (ISM). CUMBERLAND: Johnstown, Ebinger 14568 (EIU). DeKALB: Kingston Twp., Schulenberg s.n. (MOR); Shabbona Grove, Greeley s.n. (MOR). DeWITT: Kenney, Evers 10174 (ILL). DuPAGE: Naperville, Kienholz s.n. (ILL), Umbach s.n. (F, ILL), 3328 (ILL), 5300 (ILL, MOR); Lisle, Umbach s.n. (ILL), E. L. K. s.n. (MOR); Teuscher s.n. (MOR); Morton Arboretum, Lesica s.n. (MOR); McDowell Grove, Swink 96 (F); Maple Grove Forest Preserve, Swink 2197 (F). EDGAR: Kansas, Ebinger 15475 (EIU), Bergseng 118 (ILL), 119 (ILL), Fuller 10445 (ISM); Foley's Woods, Hudnut s.n. (EIU); Paris, Winterringer 10237 (ISM); Grand View, Evers 10891 (ILL); Elbridge, Evers 37145 (ILL), 73287 (ILL); Vermilion, Evers 46717 (ILL). EFFINGHAM: Effingham, Ahles 3726 (ILL), Winterringer 7977 (ISM). FAYETTE: Vandalia, Ebinger 15322 (EIU), 15336 (EIU); Wright's Corner, Evers 37000 (ILL); Ramsey, Evers 73728 (ILL). FULTON:

Bernadette, Pepoon s.n. (ILL); Anderson Lake, C. & D. Heitmann 712 (ISM), Rexroat 4575 (ISM); Middle Grove, Shildneck 10852 (ISM); Banner, Evers 17013 (ILLS). GALLATIN: Shawneetown, Evers 52951 (ILLS). GREENE: Roodhouse, Rexroat 6660 (ISM); Hillview, Koelling 2550 (ISM). GRUNDY: Morris, Evers 63879 (ILLS), 72570 (ILLS), 76109 (ILLS); Aux Sable Creek, Schulenberg, Rowlatt, & Snyder 75-157 (MOR), Schulenberg & Wilhelm 75-045 (MOR). HANCOCK: Cedar Glen, Gates 10215 (F, ILL), Hartman 669 (WIU); Mississippi River Slope, Kibbe s.n. (WIU); Nauvoo-Hamilton Roadside, Kibbe s.n. (WIU); Mount Moriah, Kibbe s.n. (WIU); Crooked Creek, Kibbe s.n. (WIU), Gates 8884 (F); Miltner Lodge, Henry 866 (WIU); Warsaw, Krauser 75 (ISM); Hamilton, Winterringer 20324 (ISM); Joette, Evers 63696 (ILLS); Fountain Green, Evers 72827 (ILLS). HARDIN: Elizabethtown, McCree 70 (SIU), 3555 (SIU), Fuller & Welch 70 (F). HENDERSON: Oquawka, Patterson s.n. (F, ILL). JACKSON: Fountain Bluff, Bailey & Swayne 2292 (SIU), Welch & Fuller 151 (SIU), Bauer 2359 (ILL), 2674 (F); Carbondale, Fuller & Welch 151 (ISM), 730 (ISM), McCree 730 (ILL); Grand Tower, Gleason s.n. (ILL); Etherton, Koelling 3036 (ISM); DeSoto, Moore 22 (SIU); Big Muddy River, Herndon 63 (SIU), Bailey & Swayne 373 (SIU, WIU), McCree 124 (SIU), 730 (SIU), 773 (SIU); Murphysboro, Evers 16814 (ILLS), 30539 (ILLS); Gorham, Evers 45655 (ILLS), 110182 (ILLS), 112699 (ILLS). JASPER: Newton, Ebinger 15250 (EIU). JERSEY: Pere Marquette State Park, Fuller 2074 (ISM); Richwood Twp., Evers 38251 (ILLS). Jo DAVIESS: Apple River Canyon State Park, Chase 5396 (ILL), Haynie 2304 (F), Fuller 7004 (ISM), Koelling 2669 (ISM), Graham 8870 (ISM), Evers 17319 (ILLS). KANE: Carpentersville, Wilhelm & Kazama 3593 (MOR). KANKAKEE: Kankakee, Hill s.n. (ILL), DeSelm 83 (F); Aroma Park, Evers 94548 (ILLS). KENDALL: Yorkville, Evers 42571 (ILLS); Oswego, Evers 108272 (ILLS). LaSALLE: Ottawa, King 402 (F); Starved Rock State Park, Greenman, Lansing, & Dixon 64 (F), Fuller 3145 (ISM), Evers 64595 (ILLS), Ries s.n. (ILLS), Werner s.n. (ILLS), Ries & Huckins s.n. (ILLS); Matthiessen State Park, Evers 60404 (ILLS). LAWRENCE: Robeson Hills, Siverts s.n. (ILL); Lawrenceville, Winterringer 4441 (ISM). LEE: Dixon, Vasey 30115 (ILL), Fuller 7032 (ILLS, ISM); Sublette, Evers 30820 (ILLS). LIVINGSTON: Rowe, Fuller 8510 (ILL, ISM); Streator, Fuller 10198 (ISM). LOGAN: Elkhart, Fuller s.n. (ILLS), 7852 (ISM); Lincoln, C. & D. Heitmann 112 (ISM). MACON: Long Creek Bank, Shildneck 3585 (ILL, ILLS, ISM); Decatur, Clokey 30980 (ILL). MACOUPIN: Macoupin, Robertson s.n. (ILLS). MADISON: Carpenter, Evers 63481 (ILLS), 68502 (ILLS). MARSHALL: Chillicothe, Chase 10275 (F), 10375 (ILL); Lacon, Evers 72370 (ILLS). McDONOUGH: Grind Stone Creek, Finly 103 (WIU); Lamoine River, R. M. M. 873 (WIU). McLEAN: Funk's Forest Natural Area, Calef 293 (ILL); Funk's Grove, Chase 16929 (ILL), Calef s.n. (ILLS), 5-127 (ILLS), Evers 43291 (ILLS); Bloomington, Armstrong 64 (ILLS), Evers 43155 (ILLS); Normal, Fox s.n. (ILL). MENARD: Athens, Hall s.n. (F); New Salem State Park, Winterringer 12485 (ISM), 12488 (ISM); Oakford, Rexroat 4630 (ISM). MERCER: Joy, Evers 94350 (ILLS), 105224 (ILLS), 113245 (ILLS). MONROE: Columbia, Ebinger 15647 (EIU), 68544 (ILLS); Fountain, Evers 107606 (ILLS). MORGAN: Prentice, Rexroat 2631 (ISM). OGLE: White Pines Forest State Park, Hills 3783 (ILL); Oregon, Waite s.n. (ILL). PEORIA: Peoria, McDonald s.n. (F, ILL); Princeville, Chase 564 (F, ILL); Peoria Heights, Chase

8302 (ILL), 13306 (ILL), 17813 (ILL, ILLS); Tubercular Sanitarium Area, Chase 3877 (ILL); Forest Park, Clausen 244 (WIU); Rocky Glen, Chase 17259 (ILLS), ISM). PIATT: Allerton Park, Seigler, Scarlet, & Becker 3904a (ILL); Monticello, Jones 17812 (ILL); Lodge, Evers 16244 (ILLS). PIKE: Pearl, Winterringer 19396 (ISM), 19397 (ISM); Valley City, Evers 49423 (ILLS). PUTNAM: Hennepin, Evers 42900 (ILLS), 64268 (ILLS); Putnam, Chase 10291 (F, ILL). ROCK ISLAND: Cordova, Evers 64182 (ILLS), 69345 (ILLS). SANGAMON: Auburn, Fuller 4095 (ISM), 7068 (ILL, ISM); Island Grove, Fuller 1118 (ISM), 3650 (ISM); Buffalo Hart, Fuller 3938 (ISM); Shermon, Fuller 2137 (ISM). SCHUYLER: Frederick, Winterringer 9966 (ISM); Scab Hollow, Tyson 39 (ISM). SCOTT: Exeter, Rexroat 3759 (ISM). SHELBY: Richland Creek, Ebinger 11392 (EIU). STARK: Spoon River, Chase 1430 (ILL). St. CLAIR: Falling Springs, Neill 5693 (ILLS, ISM), 7475 (ILLS, SIU), 8125 (ILLS, ISM), 16173 (ILLS, ISM, SIU); Edgemont, Neill 98 (ISM); Dupo, Neill 3109 (ILLS, ISM), 5425 (ISM), 6599 (ILLS, ISM), 6626 (ILLS, ISM), 16173 (ILLS), Evers 23030 (ILLS). TAZEWELL: East Peoria, Chase 3097 (ILL), 14427 (ILL, ILLS, ISM); Delavan, C. & D. Heitmann 327 (ISM). UNION: Wolf Lake, Ebinger 17202 (EIU); Union County Refuge, Dolbeare 3381 (ISM), 3382 (EIU); State Forest, Fuller & Fisher 92 (F, ILLS, ISM), Fuller 1118 (ISM); Larue Pine Hills, Winterringer 21525 (ISM), 21526 (ISM), 21527 (ISM), Buser 3898 (ILLS). VERMILION: Forest Glen Preserve, Ebinger 16353 (EIU), 17218 (EIU); Vermilion River Bank, Jones 11310 (ILL), 13576 (ILL); Grade Creek, Bell 239 (ILL); Kickapoo State Park, Jones 35410 (ILL); Fairmount, Bell & Bray 84 (ILL); Oakwood, Evers 9682 (ILLS), 38636 (ILLS), 43623 (ILLS); Collison, Evers 112838 (ILLS). WABASH: Hanging-rock, Schneck s.n. (ILL), 299 (ILL); Mt. Carmel, Schneck s.n. (ILL). WILL: Lockport, Hill s.n. (ILL), 1099 (ILL); New Lenox, Hill s.n. (ILL); Des Plaines River, Hill 1099 (F); Romeo, Umbach s.n. (F); Joliet, Skeels 228 (F), Grassly s.n. (F); Ritchey, Evers 68964 (ILLS). WINNEBAGO: Rockford, Fuller & Haime 1685 (ISM), 1699 (ISM), Fuller 2116 (ILLS); Durand, Evers 57191 (ILLS). WOODFORD: Spring Bay, Chase 11930 (ILL).

2. *Hydrophyllum canadense* L. Sp. Pl., ed. 2, 208. 1762. Broad-leaf Waterleaf.

Fibrous-rooted perennial with a long rhizome; stems 3-5 dm tall, nearly smooth; cauline leaves palmately 5- to 7-lobed; cymes dense on forked peduncles which are mostly shorter than the petioles; calyx lobes rarely with minute teeth in the sinuses; flowers purplish; stamens exerted 3-6 mm; style exerted 4-5 mm.

This species occurs in rich, damp woods and flowers from May to July. In Illinois it is occasional to rare throughout the state. *Hydrophyllum canadense* was first discovered and documented for Illinois by Vasey (1861).

### SPECIMENS EXAMINED:

BROWN: Cooperstown, Rexroat 3478 (ISM). CHAMPAIGN: Urbana, Seigler, Hoffman & Moestrop 4030 (ILL), McDougall 62 (ILL), Seigler 7587 (ILL), Winterringer s.n. (ILL), 671 (ILL), 3333 (ISM, WIU), Pepoon & Barrett 1016 (ILLS), Gates 1579.2 (F), Seymour 17069 (ILL); Champaign, Scherer 274 (ISM). COLES: Fox Ridge State Park, Thut s.n. (EIU); Charleston, Ebinger 7607 (EIU), Fuller 10388 (ISM). CRAWFORD: Palestine, Ebinger 15474 (EIU), Evers 29530 (ILLS), 34666 (ILLS), 43240 (ILLS), 96488 (ILLS), Phillippe 219 (EIU), Ahles 2110 (ILL), Pepoon & Barrett 4784 (ILLS). DeWITT: Wapella, Shildneck

7849 (ILL); Clinton, Shildneck 7849 (ISM). DOULGAS: Douglas County Conservation Area, Phillippe 452 (EIU), 1581 (EIU). EDGAR: Kansas, Fuller 11346 (ISM). GALLATIN: Gibsonia, Evers 57769 (ILLS). HARDIN: Blind Hollow, Evers 76403 (ILLS). HENDERSON: Oquawka, Patterson s.n. (F). JACKSON: Little Grand Canyon, Bailey & Swayne 2436 (SIU); Giant City State Park, French s.n. (SIU), Jones 22165 (ILL), Pepon & Barrett 448 (ILLS), Mohlenbrock 1296 (ISM), Fuller 11662 (ISM); Murphysboro, Evers 16806 (ILLS); Makanda, Cranwill s.n. (ILL). JERSEY: Grafton, Winterringer 18914 (ISM). LaSALLE: LaSalle, Pepon & Foster 1150 (ILLS). LAWRENCE: Robeson Hills, Sivert s.n. (ILL); Lawrenceville, Winterringer 6377 (F, ISM), Sivert s.n. (ISM). McLEAN: Bloomington, Chase 15991 (ILL); Funk's Forest Natural Area, Calef 288 (ILL), 561 (ILL); Funk's Grove, Fuller 8730 (ILL, ILLS, ISM), 11470 (ILL, ISM), Evers 43307 (ILLS), Calef s.n. (ILLS). MENARD: Oakford, Rexroat 4618 (ISM). POPE: Lusk Creek, Hopkins 938 (SIU). RANDOLPH: Modoc, Trojcek 218 R (ISM). SCHUYLER: Rushville, Rexroat 7580 (ISM). SHELBY: Richland Creek, Ebinger 11391 (EIU); Cowden, Shildneck 7485 (MOR). UNION: Larue Pine Hills, Henry 1387 (WIU). WABASH: Little Rock, Schneck s.n. (ILL).

3. *Hydrophyllum macrophyllum* Nutt. in Journ. Acad. Sci. Phila. 7:111. 1834. Large-leaf Waterleaf.

Stems 3-7 dm tall, hirsute; cauline leaves pinnately 9- to 13-lobed or compound; cyme compact, borne on peduncles shorter than petioles; calyx lobes very hairy; corolla purple-pinkish; stamens and style long-exserted.

This species is found in rich, moist woods and flowers during May and June. In Illinois it is confined to the southern one-fourth of the state. It was discovered by Dr. Short and was first documented for Illinois by Patterson (1876).

### SPECIMENS EXAMINED:

EDWARDS: Albion, Winterringer 7122 (ISM). HARDIN: Elizabethtown, Telford s.n. (ILLS). PUTNAM: Magnolia, Evers 9239 (ILLS). RICHLAND: Olney, Ebinger 18972 (EIU), Evers 86523 (ILLS), Scherer 324 (ISM); Parkersbury, Evers & Boewe 2514 (ILLS). VERMILION: Danville, Schneck s.n. (ILL). WABASH: Mt. Carmel, Schneck s.n. (ILL), Shearer s.n. (ILL), Winterringer 7121 (F, ILL, ISM); Odd Fellow's Cemetery, Schneck s.n. (ILL); Hanging Rock, Schneck s.n. (ILL). WASHINGTON: New Minden, Evers 44123 (ILLS). WAYNE: Fairfield, Walker 103 (ILL).

4. *Hydrophyllum virginianum* L. Sp. Pl. 146. 1753. Virginia Waterleaf, John's Cabbage.

Stems 3-8 dm tall, smooth to strigosely hairy with adpressed hairs rarely to 0.5 mm long; cauline leaves pinnately 5- to 7-lobed; cyme dense on forked peduncles longer than the petioles of the upper leaves; calyx lobes linear, hispid; corolla lavender; stamens and style long-exserted.

This species occurs in low, rich woods and damp clearings. *Hydrophyllum virginianum* was first discovered in Illinois by Mead (1846). In Illinois it is occasional to common throughout the state.

This species of *Hydrophyllum* has at times been confused with another member of the family - *Phacelia bipinnatifida* Michx. In *Phacelia bipinnatifida*, the peduncles and main axis are glandular-pubescent. It is a taprooted plant and produces 4 to many seeds. In contrast, the peduncles and main axis of *H.*

*virginianum* are not glandular-pubescent. *Hydrophyllum virginianum* is a fibrous-rooted perennial with a long rhizome. It produces 1-4 seeds.

### SPECIMENS EXAMINED:

ADAMS: Burton, Fuller 2593 (ILL, ILLS, ISM), Brinker 3399 (ILL, ILLS, ISM), Evers 1137 (ILL); Burton Cave, Henry 2304 (WIU); Quincy, Brinker 2507 (ILL, ILLS, ISM); St. Anthony's, Brinker 1165 (ILLS). ALEXANDER: Thebes, Franklin s.n. (ILL). BOONE: Belvidere, Fuller 12267 (ISM), E. Fell 54738 (ISM); Caledonia, E. Fell 54294 (ISM); Poplar Grove, Evers 69159 (ILLS). BUREAU: Tiskilwa, Evers 42882 (ILLS); Dover, Evers 73193 (ILLS); Princeton, Evers 64245 (ILLS). CARROLL: Mississippi Palisades State Park, Chase 11804 (ILL), Wunderlin 832 (WIU), Evers 64150 (ILLS); Thomson, Evers 102208 (ILLS); Savanna, Evers 73045 (ILLS), 90662 (ILLS), Koelling 2599 (ISM). CASS: Davidsmeyer Hill Prairie, Tyson 34 (ISM). CHAMPAIGN: Urbana, Benjamin s.n. (ILL), Gregory 29678 (ILL), Clinton 32076 (ILL), Winterringer 570 (ILL), 828 (ILL), 4002 (ISM), Jones 13951 (ILL), 15709 (ILL), 16000 (ILL), Atteberry s.n. (ILL), Honens s.n. (ILL); Mahomet, Jones 11754 (ILL), 19079 (ILL), Sanderson s.n. (ILLS), Evers 56463 (ILLS); Champaign, MacGregor s.n. (ILL); St. Joseph, Gates 1595 (F), Coates s.n. (ISM); Gifford, Evers 94592 (ILLS), 102921 (ILLS). CHRISTIAN: Taylorville, DeMotte s.n. (ILL), Trojcek s.n. (ISM), Winterringer 7674 (ISM). CLARK: Big Creek, Ebinger 7537 (EIU); Rocky Branch Nature Preserve, Hellinga 162 (EIU). COLES: Charleston, Sampson s.n. (EIU), Sargent s.n. (EIU), Phipps & Speer 351 (EIU); Fox Ridge State Park, Thut s.n. (EIU), Evers 22868 (ILLS), 22883 (ILLS), Hutton, Evers 46525 (ILLS); Embarrass River, Jones 15113 (ILL). COOK: Palos Park, Stein s.n. (ILLS); Palos Heights, Post 88 (MOR); Sutton, Evers 63961 (ILLS); Deer Grove, Chase 8773 (ILL), 8822 (ILL); Edgebrook Forest Preserve, Bennett s.n. (F, ILL); Leyden, Bennett s.n. (ISM); Grand Crossing, Hill s.n. (ILL); Chicago, Hill s.n. (ILL), Babcock s.n. (F), Moffatt 153 (F); Glencoe, Blatchford s.n. (F); Elk Sanctuary-Busse Woods, Stolze 217 (F); Pullman, Lansing s.n. (F), 178 (F), 912 (F); Elmhurst, Blatchford & Fowler s.n. (F); Berwyn, Calkins 253 (F); Evanston, Alling s.n. (F), Raddin s.n. (F), Johnson 2122 (F), Admire s.n. (F), Knox s.n. (F); Lemont, Swink 920 (F); Riverside, Grassly s.n. (F), Babcock s.n. (F), Filek 70 (F), Bross s.n. (F), Haynie s.n. (F), Hutchinson s.n. (F); Morgan Park Ridge, Dixon & Gage 727 (F); Glenwood, King 375 (F); Che-Che-Pin-Qua Forest Preserve, Reich 66 (F), 253 (F); Hinsdale, E. C. S. 879 (F); Edgebrook, Gates 368 (F). CRAWFORD: Oblong, Winterringer 14021 (ISM). CUMBERLAND: Johnstown, Ebinger 14567 (EIU). DeKALB: Genoa, Evers 56787 (ILLS); Sycamore, Evers 95692 (ILLS), Whitford 270 (ISM); Hinckley, Whitford 141 (ISM); Waterman, Greeley s.n. (MOR); Shabbona Grove, Greeley s.n. (MOR). DeWITT: Wapella, Winterringer 6841 (ISM, WIU), 7544 (ISM); Kenney, Evers 16140 (ILLS), 60087 (ILLS). DOUGLAS: Villa Grove, Evers 46508 (ILLS); Douglas County Conservation Area, Phillippe 1334 (EIU); Arcola, Winterringer 1016 (ILL). DuPAGE: Roselle, Chase 9416 (F, ILL); Wheaton, Lloyd s.n. (ILL), Moffatt s.n. (ILL), 515 (ILL), Fuller 1169 (ISM), Blount 163 (ISM), 269 (ISM); Lombard, Moffatt s.n. (ILL); Maple Grove Forest Preserve, Swink 1046 (F); Naperville, Umbach s.n. (F), 5301 (MOR); Morton Arboretum, Fuller 3103 (ISM), Lesica s.n. (MOR), Read & Ciolac 316 (MOR); Lisle, Teuscher s.n. (MOR), E. L. K. s.n. (MOR), L. C. H.

s.n. (MOR). EDGAR: Kansas, Ebinger 8203 (EIU), 15476 (EIU), Kloker 63 (EIU), Bergseng 120 (ILL), 122 (ILL); Paris, Ebinger 15270 (EIU); Foley's Woods, Hudnut s.n. (EIU). EFFINGHAM: Beecher City, Evers 37037 (ILLS); Rock Cave Nature Preserve, Ebinger 17775 (EIU). FAYETTE: Ramsey, Marty 15003 (ISM). FORD: Paxton, Anderson s.n. (F), 1746 (ILL); Roberts, Seng 65 (ILL); Elliott, Evers 73258 (ILLS). FULTON: Table Grove, Evers 96127 (ILLS), 99010 (ILLS); Marietta, Evers 94435 (ILLS), 94869 (ILLS); Coal Creek Bank, Schildneck 10868 (ISM). GREENE: Greenfield, Evers 43703 (ILLS). GRUNDY: Mazon, Evers 42531 (ILLS), 86763 (ILLS). HANCOCK: Crooked Creek, Gates 10148 (ILL); Carthage, Gates 8853 (F, ILL), Sallee s.n. (WIU); Cedar Glen, Henry 191 (WIU), 865 (WIU), Hartman 279 (WIU), 690 (WIU), Gates 10202 (F); Nauvoo, Kowling 3401 (ISM); LaHarpe, Henry 3654 (WIU); Hamilton, Henry 1857 (WIU), Winterringer 20322 (ISM), 20332 (ISM). IROQUOIS: Iroquois, Shaw 1157 (ISM), Evers 60007 (ILLS). JASPER: Rose Hill, Johnson 14166 (ILL); Newton, Winterringer 7631 (ISM). Jo DAVIESS: Apple River Canyon State Park, Evers 46116 (ILLS), 46150 (ILLS), Hinkley s.n. (SIU), Jones 15857 (ILL), 21949 (ILL), Winterringer 16792 (ISM), Koelling 2682 (ISM), Fuller 7001 (ISM), 8015 (ISM), 17142 (ISM); Galena, Lansing 4241 (F); Hanover, Evers 46251 (ILLS); Woodbine, Evers 102158 (ILLS); Rice, Evers 9586 (ILLS); Council Hill Station, Evers 37693 (ILLS); Elizabethtown, Evers 73085 (ILLS); Blanding, Evers 17214 (ILLS). JOHNSON: Heron Pond, White 1024 (SIU). KANE: Sugar Grove, Evers 76153 (ILLS), 79513 (ILLS); Elburn, Evers 56816 (ILLS), 69069 (ILLS), 72616 (ILLS); Elgin, Gronemann 10 (F), 11 (F), Sherff s.n. (F), 3047 (F), KANKAKEE: Aroma Park, Evers 94530 (ILLS); Rock Creek Gorge, Evers 16325 (ILLS), 16346 (ILLS); Kankakee, Hill s.n. (ILL), DeSelm 85 (F); Kankakee River State Park, Swink 2092 (F). KENDALL: Harris Forest Preserve, Swink s.n. (MOR). KNOX: Dahinda, Evers 63819 (ILLS). LAKE: Highland Park, Robertson & Himelick 1120 (ILLS); Miltmore Lake, Moran 10 (SIU); Lake Bluff, Fuller 15536 (ISM). LaSALLE: #7 County Road, Pepoon & Barrett 4056 (ILLS); Starved Rock State Park, Ries s.n. (ILLS), Werner s.n. (ILLS); Utica, Evers 33596 (ILLS); Peru, Evers 83252 (ILLS); Matthiessen State Park, Evers 60400 (ILLS); Ottawa, King 401 (F). LAWRENCE: Lawrenceville, Sivert s.n. (ILL). LEE: Franklin Grove, Evers 73141 (ILLS); Sublette, Evers 30814 (ILLS); Dixon, Fuller 7036 (ILLS, ISM), 7681 (ILLS, ISM), Keithley s.n. (ILL), 61 (ISM); Lowell Park, Fuller 12278 (ISM); Amboy, Winterringer 16769 (ISM). LIVINGSTON: Long Point, Evers 83271 (ILLS), 87347 (ILLS); Rowe, Fuller 8509 (ILL, ILLS, ISM); Rook Creek, Fuller 10189 (ISM); Forrest, Fuller 10324 (ISM). LOGAN: Union, Evers 37128 (ILLS), Lake Fork, Evers 60121 (ILLS); Elkhart, Fuller s.n. (ILLS), 7851 (ISM); Mt. Pulaski, C. & D. Heitmann 95 (ISM). MACON: Decatur, Evers 63404 (ILLS); Long Creek Bank, Schildneck 3586 (ILL, ILLS, ISM). MACOUPIN: Carlinville, Robertson s.n. (ILLS). MADISON: Alton, Winterringer 19962 (ISM). MARSHALL: Senachwine Creek, Chase 1390 (ILL); Lacon, Evers 22630 (ILLS). MASON: Kilbourne, Rexroat 8166 (ISM); Easton, Evers 28807 (ILLS), Koelling 5627 (ISM); Havana, C. & D. Heitmann 145 (ISM). McDONOUGH: Augusta, Pepoon & Barrett 5190 (ILLS); Eldorado Twp., Evers 30949 (ILLS); Lake Vermont Park, Neal 58 (WIU), 59 (WIU), 826 (ILLS), 827 (WIU), 828 (SIU); Golf Course, Wingfield 16 (WIU), 20 (WIU), Myers s.n. (WIU), 2278 (WIU); Macomb, Myers M 1 (ISM); Spring Lake, Weigt 45 (WIU), Myers 237 (ISM);



Argyle Hollow, Myers 249 (WIU), 526 (ISM, WIU). McHENRY: Algonquin, Nason s.n. (ILL); Fox River Grove, Chase 9539 (ILL); Ringwood, Fuller 12896 (ISM). McLEAN: Normal, Steagall s.n. (SIUO, Fox s.n. (ILL); Funk's Forest Natural Area, Calef 245 (ILL); Funk's Grove, Fuller 10276 (WIU), 11469 (ISM), Calef s.n. (ILLS). MENARD: Athens, Hall s.n. (F); New Salem State Park, Winterringer 12484 (ISM). MERCER: Joy, Evers 105225 (ILLS), 113251 (ILLS); Gilchrist, Evers 63790 (ILLS); Viola, Koelling 3780 (ISM). MONTGOMERY: Irving Park, Lloyd s.n. (F); Fillmore, Evers 68836 (ILLS). MORGAN: Arnold, Carter s.n. (EIU), Winterringer 5807 (ISM); Jacksonville, Winterringer 19307 (ISM), 19045 (ISM), 19046 (ISM), 19391 (ISM), Rexroat 8770 (ISM). MOULTRIE: Sullivan, Evers 15993 (ILLS), 16018 (ILLS). OGLE: Byron, Chase 10351 (ILL); White Pines Forest State Park, Hills 3323 (ISM), 3532 (ISM), 3782 (ILL); Oregon, Waite s.n. (ILL), Evers 42780 (ILLS); Forreston, Evers 108348 (ILLS). PEORIA: Kickapoo Valley, Chase 4359 (ILL); Al Fresco Park, Chase 3826 (ILL); Detweiler Park, Chase 18343 (ILL, ILLS); Forest Park, Chase 17798 (ILL); Peoria Heights, Chase 13314 (ILL), 16473 (ILL), Peoria, McDonald s.n. (F, ILL), Stewart s.n. (F). PIATT: Allerton park, Ebinger 12708 (EIU), Seigler, Scarlet, & Becker 3904 (ILL). PIKE: Chambersburg, Rexroat 5748 (ISM). PUTNAM: Hennepin, Evers 42910 (ILLS); Magnolia, Evers 9188 (ILLS), 60501 (ILLS), 60579 (ILLS). ROCK ISLAND: Illinois City, Evers 72947 (ILLS); Cordova, Evers 46327 (ILLS), 94325 (ILLS), Chase 12381 (ILL); Hillsdale, E. & G. Fell 4768 (ISM). SANGAMON: Sangamon River Woods, Westora s.n. (ILL); Woodside, Fuller 7069 (ISM); Gardner, Fuller 4198 (ISM); Cooper, Fuller 3574 (ISM); Berlin, Winterringer 9930 (ISM); Rochester, Winterringer 14542 (ISM). SCHUYLER: Beardstown, Fuller 11554 (ISM); Littleton, Winterringer 20332 (ISM); Rushville, Winterringer 17958 (ISM), 17980 (ISM). SCOTT: Exeter, Rexroat 3758 (ISM). SHELBY: Lakewood, Evers 36886 (ILLS). STARK: Wady Petra, Chase s.n. (F, ILL). St. CLAIR: Scott Field, Neill s.n. (ILLS). STEPHENSON: Freeport, Evers 9444 (ILLS); Damascus, Evers 37610 (ILLS), Cedarville, Evers 64100 (ILLS), 86815 (ILLS); Ridott, Ahles 4527 (ILL); Baileyville, Koelling 2658 (ISM); Lena, Koelling 3072 (ISM). VERMILION: Collison, Evers 112818 (ILLS); Langley Bottoms, Parnaruskis s.n. (ILL); Kickapoo State Park, Jones 44361 (ILL); Vermilion River, Jones 11720 (ILL). WHITESIDE: Fulton, Evers 90601 (ILLS), 94293 (ILLS). WILL: Joliet, Skeels 227 (F), Shaw s.n. (F), W. U. C. 7 (F). WINNEBAGO: Rockford, Hawkins s.n. (ILLS), Fuller 1309 H (ILLS), Fuller & Haime 1390 H (ISM), 1574 H (ISM), E. Fell 4572 (ISM); Kishwaukee River, E. & G. Fell 46213 (ISM). WOODFORD: Cazenovia, Chase 4961 (ILL).

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