A SURVEY OF SOUTHERN ILLINOIS AQUATIC VASCULAR PLANTS

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This study is a floristics survey of the aquatic habitats and aquatic vascular plants in southern Illinois (See fig. 1). After a discussion of aquatic situations there is appended a check-list of aquatic vascular plants from southern Illinois.

The southern tip of Illinois forms a wedge-shaped area bounded by the Mississippi River to the west and the Ohio River to the east. The mainland is traversed by a number of rivers and streams, the most notable of which are the Cache and Big Muddy Rivers. Numerous man-made and natural lakes and ponds occur, the largest being concentrated in the Williamson County area. Limestone sinks are common in a few areas. Swamps and swampy woods are frequent in the extreme southern tip of Illinois, and these harbor plants which are rare or absent in other parts of the state. In addition, a few other less important aquatic habitats may be found.

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UBIQUITOUS SPECIES

A number of southern Illinois aquatics may be considered ubiquitous—i.e., they occur frequently in any type of aquatic situation. Woody plants with wide distribution are black willow (*Salix nigra*), cottonwood (*Populus deltoides*), hackberry (*Celtis occidentalis*), and buttonbush (*Cephalanthus occidentalis*). Eight grasses are ubiquitous—*Eragrostis spectabilis*, fowl manna grass (*Glyceria striata*), panic grasses (*Panicum agrostoides*, *P. anceps*, *P. polyanthes*, and *P. tennesseense*), and two species of bead grass (*Paspalum circulare* and *P. pubescens*). Ubiquitous sedges include *Carex vulpinoidea*, *Cyperus esculentus*, *Eleocharis obtusa* var. *obtusa*, *E. tenuis* var. *verrucosa*, and *Scirpus atrovirens*. Although numerous herbaceous species are aquatic, most seem to have preference for one type of aquatic situation over another. However, a few are tolerant to all aquatic conditions. These are yellow cress (*Rorippa islandica*), ditch stonecrop (*Penthorum sedoides*), *Ammannia coccinea*, frog-fruit (*Phyla lanceolata*), hedge hyssop (*Gratiola neglecta*), *Lindernia dubia*, *L. anagallidea*, beggar's tick (*Bidens aristosa*), and *Eclipta alba*.

RIVERS AND STREAMS

General.—While a great number of streams with varied conditions occur in southern Illinois, several species of vascular plants are common to all. (Under each major division the ubiquitous species will not be repeated.) Sycamore (*Platanus occidentalis*), river birch (*Betula nigra*), sandbar willow (*Salix interior*), swamp chestnut and pin oaks (*Quercus michauxii* and *Q. palustris*), and silver maple (*Acer saccharinum*) are woody species found along all waterways. Among the herbaceous species which occur along nearly all rivers and streams are woodreed (*Cinna arundinacea*), pony grass (*Eragrostis hypnoides*), sedges (*Cyperus acuminatus*, *C. aristatus*, *C. erythrorhizos*, *C. ferruginescens*, and *C. strigosus*), tall hempweed (*Acnida altissima*), *Rorippa sessiliflora*, *Gerardia tenuifolia*, *Leucospora multifida*, and *Aster praealtus*. In addition, two high-climbing grapes abound along rivers and streams. These are *Vitis aestivalis* and *V. cinerea*.

The large rivers.—The Mississippi River.—The Mississippi River, which marks the western boundary of Illinois, has been investigated intensively at six stations interspersed from Cora (on the Randolph-Jackson County line) to Dogtooth Island (at the extreme southern tip of Illinois). (See figure). The Cora station (I) is wooded to within a few meters of the river. Plentiful here are swamp privet (*Forestiera acuminata*) and *Scutellaria lateriflora*. The latter not only occurs along the sandy shore-line but becomes a rank weed in the adjacent woodland. This station also has the only good stand of *Salix rigida* in southern Illinois. Station II, near Neunert, is adjacent to farmland and is somewhat disturbed. This is evidenced by the encroachment of a number of adventives along the shoreline (not included in the check-list due to their clearly adventive and temporary condition). In pure sand along the shoreline occur four rare southern Illinois plants—*Hemicarpha micrantha*, *Potentilla paradoxa*, *Rumex fueginus*, and *Jussiaea leptocarpa*. The first three of these also occur at Station III, while the last has been found a few times along the Mississippi River. Stations III and IV, both near Grand Tower, are in pure sand, but the former is in a treeless area commonly washed by river water while the latter is adjacent to a sandbar willow consocies which is infrequently inundated. Some vegetational differences occur. Station III has a greater variety of plants, including *Acalypha rhomboidea* and the only southern Illinois records of *Chamaesyce geyeri* and *Cyperus diandrus*. Conspicuous at Station IV is the winged pigweed (*Cycloloma atriplicifolium*) which often forms dense colonies. At both stations *Leptochloa attenuata*, *L. fascicularis*, and *Eragrostis frankii* are common. Station V, adjacent to a thick woodland a few hundred meters south of the bridge to Cape Girardeau, Missouri, presents no unusual vegetational patterns, although *Bidens aristosa* is very abundant.

Station VI, on Dogtooth Island, is rather sparse with vegetation because of

frequent inundations. Few trees occur at this station, and herbaceous plants are frequently dwarfed. Several species of *Cyperus*, *Gratiola lutea*, and *Jussiaea leptocarpa* are most common. In addition, the very rare *Eragrostis reptans* is found.

The Ohio River.—The Ohio River borders the southeastern corner of southern Illinois from near New Haven (Gallatin County) to Cairo. We have investigated two stations. Station VII is at Lock and Dam 53 near Olmstead. Here a rather narrow shoreline gives way to a deep floodplain woods. On the shore, besides the ubiquitous species, are *Mimulus ringens*, *Eragrostis frankii*, *Rotala ramosior*, *Gratiola lutea*, and others. The floodplain woods, dominated by cottonwood, black willows, and peach-leaved willow (*Salix amygdaloides*), is nearly overrun by the high climbing bur-cucumber (*Sicyos angulatus*). In the understory, species of *Eupatorium* and camphor weed (*Pluchea camphorata*) occur. It is here that *Melanthera hastata*, not known within several hundred miles, occurs in two rather vigorous colonies. Station VIII, at Cave-in-Rock State Park, has a sandy shoreline which ranges from 5–50 meters wide. It ends abruptly at a massive limestone bluff. That these bluffs have influenced the type of vegetation along the shore

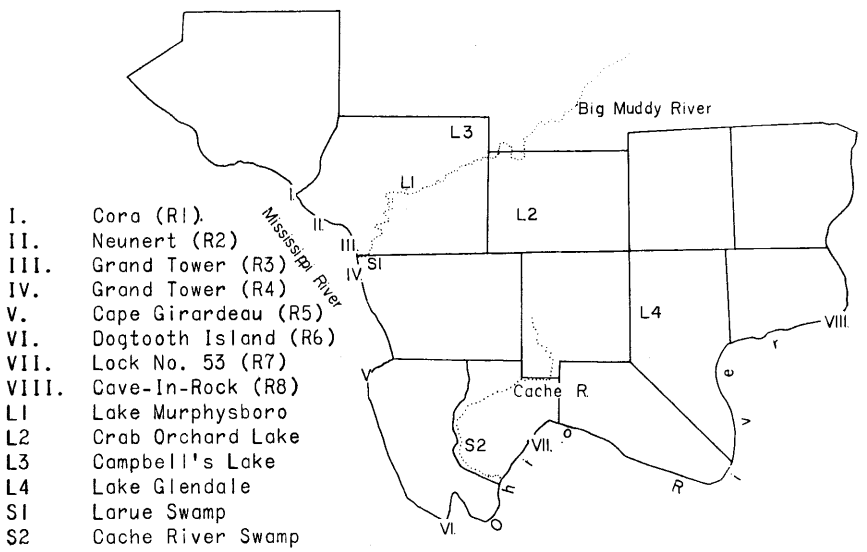

FIGURE 1. Map of the study area showing collecting stations.

is not readily observed. Only the occurrence of many plants of *Artemisia biennis* is strikingly different from any other aquatic station. Other workers have found rare species along the Ohio River. Buser has collected *Sesbania exaltata* at Mound City in Pulaski County. Palmer and Forbes have found *Tragia cordata* at Golconda in Pope County.

Of the larger rivers within the confines of southern Illinois, two will be mentioned briefly. The Big Muddy River has its source near Cravat (Jefferson County) and, after winding its way for approximately 110 miles, empties into the Mississippi River 4 miles south of Grand Tower (Jackson County). As the river nears its outlet, an interesting tree flora made up of overcup oak (*Quercus lyrata*), bur oak (*Q. macrocarpa*), swamp white oak (*Q. bicolor*), river-nut hickory (*Carya laciniosa*), and pecan (*C. illinoensis*) lines its banks. The Cache River, thought to be an old channel of the Ohio River, extends for approximately 55 miles from

near Saratoga (Union County) to Urbandale (Alexander County) near which it empties into the Ohio. The topography surrounding the Cache River is conducive to the formation of swamps and swampy woodlands (those of the Cache River will be discussed under the division on swamps). It is a common sight, however, to see bald cypress (*Taxodium distichum*), swamp cottonwood (*Populus heterophylla*), water elm (*Planera aquatica*), and others along the banks of this river. Other rivers, including the Little Muddy and the Saline, have not produced any unusual vegetational patterns.

Small streams and creeks.—Because many small streams and creeks are found deep in the valley of mesophytic woods, there frequently is an encroachment of woodland herbs along the streams. These scarcely can be considered aquatic plants and will not be discussed in this paper. The small streams usually have a typical basic flora. This is composed of the small flax (*Linum striatum*), small-flowered St. John's-wort (*Hypericum mutilum*), *Juncus tenuis*, *Spermacoce glabra*, and brookweed (*Samolus parviflorus*). Several species have selected particular streams along which to grow. Alder (*Alnus serrulata*) is common along clear Bay Creek in southeastern Illinois, but is virtually absent from the southwest (one plant has been found in Jackson County). Cow-parsnip (*Heracleum lanatum*) occurs along the same Bay Creek and also along an unnamed stream near Oraville in Jackson County. *Carex emoryi* grows in a swiftly flowing stream in Buffalo Hollow (Johnson County). *Carex substricta* has a single occurrence along Piney Creek in Randolph County; *Carex torta* is found abundantly in the middle of rapidly moving streams in a few localities. In the midst of a streamlet in Lake Murphysboro State Park is the heart-leaved plantain (*Plantago cordata*). Of more common occurrence along streams are silky willow (*Salix sericea*) and water willow (*Dianthera americana*).

LAKES AND PONDS

With the current emphasis upon southern Illinois as an outdoor recreation area, numerous artificial lakes have been developed. The largest of these are in the western part of Williamson County. In descending order of water surface acreage, these bodies of water are Crab Orchard Lake, Little Grassy Lake, and Devils Kitchen Lake. For studies of the first and third of these lakes see Hankla (1950) and Abney et al. (in press), respectively. Other lakes of considerable size in southern Illinois are Lake Murphysboro, Lake Glendale, and Pounds Hollow. All of these have a similar basic flora. In the water are coontail (*Ceratophyllum demersum*), pondweeds (*Potamogeton* spp.), naiads (*Naias* spp.), water lotus (*Nelumbo lutea*), arrowhead (*Sagittaria latifolia*), yellow water primrose (*Jussiaea diffusa*), and water lily (*Nuphar advena*). Along the shores are numerous sedges (*Carex* spp.), cat-tail (*Typha latifolia*), and rushes (*Juncus* spp.). Wolf Lake, in Union County, is bordered by pickerel-weed (*Pontederia cordata*) and arrow-arum (*Peltandra virginica*). (For a detailed account of Wolf Lake, see Mohlenbrock [1959]). Lake Glendale in Pope County is the home for *Cyperus rivularis* and *Scirpus purshianus*. The following are other uncommon species from limited localities: *Naias gracillima* from a temporary pond near Gorham in Jackson County (only Illinois station); *Echinodorus rostratus* and *Myriophyllum heterophyllum* from the pond in Murphysboro City Park; *Elodea densa* from Madison Pond near Blairsville in Williamson County (only Illinois station); *Elodea occidentalis* from a factory pond in Murphysboro; *Scirpus fluviatilis* and *Myriophyllum pinnatum* from the Randolph County Country Club Lake at Sparta; *Salix caroliniana* from a lake near DuQuoin; and *Hibiscus moscheutos* from Crab Orchard Lake. Campbell's Lake, near Elkville (Jackson County), should be considered in more detail because of the unusual aquatic flora which it harbors. The lake is surrounded by extensive low, swampy woodlands. The waters of the lake are shallow and present a suitable place of growth for many species. Besides the

usual species of ponds and lakes found there, several rare Illinois plants also occur. These are mosquito fern (*Azolla mexicana*), pondweed (*Potamogeton friesii*), *Wolffia columbiana*, and *W. punctata*.

A special class of ponds which are the result of strip coal mining are numerous in Perry, Jackson, and Williamson Counties. These strip mine ponds have been the subject of investigation by Bell (1956) and Brewer and Triner (1956). Because of extensive planting in these areas, numerous adventive aquatics occur. It is frequently difficult to ascertain the exact status of some of these species.

Sink-hole or upland ponds occur in southern Illinois in areas underlain by exceptionally porous limestone. Most of them are found in Hardin, Monroe and Randolph Counties. These have been investigated by Bollwinkel (1958) who found nothing but the usual aquatic species common to ponds and lakes. That many of these upland ponds were greatly disturbed through pasturing is evident by the number of adventive species which has been recorded. The Illinois "sinks" are in direct contrast to the mostly undisturbed upland ponds in southern Missouri. Steyermark has found the Missouri "sinks" to harbor many relics of the Coastal Plain flora.

A number of temporary ponds exists in southern Illinois. These are filled with water only for a portion of each year, becoming dry usually by late summer. They vary in size, but most are only a few square meters. Characteristic species are *Ludwigia palustris*, mermaidweed (*Proserpinaca palustris*), *Ammannia coccinea*, *Rotala ramosior*, camphor weed (*Pluchea camphorata*), *Lindernia dubia*, *Leucospora multifida*, and species of smartweed (*Polygonum* spp.) and beggar's-tick (*Bidens* spp.).

SWAMPS AND SWAMPY WOODLANDS

Through poor drainage in lowlands, a number of deep swamps has developed in extreme southern Illinois. As these become more shallow away from their center, the swamps give way to swampy woodlands which are inundated only briefly or not at all during the year. Two areas possess extensive swamp vegetation. One of these, in the northwestern corner of Union County, has been studied by Mohlenbrock (1959). The other area is very extensive and occurs along the entire length of the Cache River. The vegetation in both swampy areas is related distinctly to the vegetation of the Coastal Plain. Woody species include bald cypress, water tupelo (*Nyssa aquatica*), water locust (*Gleditsia aquatica*), water hickory (*Carya aquatica*), pumpkin ash (*Fraxinus profunda*), willow oak (*Quercus phellos*), swamp cottonwood, and water elm. Among the shrubs are Virginia willow (*Itea virginica*), storax (*Styrax americana*), *Euonymus americanus*, and southern buckthorn (*Bumelia lycioides*).

Since the number of herbaceous species which grow in southern Illinois swamps is so numerous, they will not be enumerated here as they do appear in the checklist. There is no distinction made in the checklist between plants of swamps and those of swampy woodlands.

Checklist of Southern Illinois Aquatic Vascular Plants

Specimens of all the following from various southern Illinois localities are on deposit in the herbarium of Southern Illinois University. A total of 352 species is enumerated. The key to the localities in the checklist is as follows:

R1—Mississippi River at Cora (I).
R2—Mississippi River at Neunert (II).
R3—Mississippi River north of Grand Tower (III)
R4—Mississippi River south of Grand Tower (IV).
R5—Mississippi River at Cape Girardeau bridge (V).
R6—Mississippi River at Dogtooth Island (VI).
R7—Ohio River at Lock and Dam Number 53 (VII).

R8—Ohio River at Cave-in-Rock (VIII).
L1—Lake Murphysboro
L2—Crab Orchard Lake
L3—Campbell's Lake
L4—Lake Glendale
S1—LaRue Swampy Area
S2—Cache River Swampy Area

ISOETACEAE SCHAFFNER

Isoetes melanopoda Gay and Dur. Known only from a roadside ditch along Route 3, 9 miles southwest of Murphysboro. The pale-based f. *pallida* Fern. also occurs here.

EQUISETACEAE MICHX.

Equisetum arvense L. R4, R5.
Equisetum hyemale L. At nearly all stations.
Equisetum laevigatum A. Br. S2.

MARSILEACEAE R. BR.

Marsilea quadrifolia L. Campus pond, Southern Illinois University, Carbondale. Now extinct.

SALVINIACEAE REICHENB.

Azolla mexicana Presl. L3; S2.

TAXODIACEAE SCHIMPER

Taxodium distichum (L.) Rich. S1, S2.

TYPHACEAE J. ST. HIL.

Typha angustifolia L. L2; also Little Grassy Lake in Williamson County.
Typha latifolia L. In or around most lakes and swamps; rare or absent at river stations.

SPARGANIACEAE J. G. AGARDH

Sparganium androcladum (Engelm.) Morong. S2.
Sparganium chlorocarpum Rydb. S2.
Sparganium eurycarpum Engelm. S2.

NAIADACEAE LINDLEY

Naias flexilis (Willd.) Rostk. and Schmidt. L1.
Naias gracillima (A. Br.) Magn. Found once in Illinois (1958) in a temporary pond in Jackson County.
Naias guadalupensis (Spreng.) Magn. L2.

POTAMOGETONACEAE ENGLER

Potamogeton americanus Cham. and Schlecht. L1, L2.
Potamogeton diversifolius Raf. L1, L2, L4; S2.
Potamogeton foliosus Raf. L1, L2.
Potamogeton friesii Rupr. L3.
Potamogeton pectinatus L. L1.

ALISMACEAE DC. IN LAM. AND DC.

Alisma subcordatum Raf. Most aquatic situations except along rivers.
Echinodorus cordifolius (L.) Griseb. S2; also rarely in other southern Illinois localities.
Echinodorus rostratus (Nutt.) Engelm. Known only from the "Lagoon," Riverside Park, Murphysboro.
Sagittaria brevirostra Mack. and Bush. L2; also in wet roadside ditches.
Sagittaria calycina Engelm. L1, L4.
Sagittaria graminea Michx. Wet roadside ditches along Route 3, Alexander and Jackson Counties.
Sagittaria latifolia Willd. In or around most lakes and swamps.
Sagittaria rigida Pursh. Wet roadside ditches in Alexander and Pulaski Counties.

HYDROCHARITACEAE FL.

Elodea canadensis Michx. S2.
Elodea densa (Planch.) Caspary. In Madison Pond near Blairsville, Williamson County.
Elodea occidentalis (Pursh) St. John. Factory pond, Murphysboro. Now almost certainly extinct.
Limnobium spongia (Bosc) Steud. S2.

GRAMINEAE JUSS.

Alopecurus aequalis Sobol. S2.
Arundinaria gigantea (Walt.) Muhl. Along rivers and near swamps.
Cinna arundinacea L. Along most rivers and streams.
Echinochloa crusgalli (L.) Beauv. Most moist situations.
Echinochloa walteri (Pursh) Heller. S2.
Eragrostis frankii C. A. Mey. Found at all of the river stations.
Eragrostis hypnoides (Lam.) BSP. Found at all of the river stations and most of the lake stations.
Eragrostis reptans (Michx.) Nees. R7.
Eragrostis spectabilis (Pursh) Steud. Along most of the river stations.
Glyceria arkansana Fern. S2.
Glyceria pallida (Torr.) Trin. S2. Specimen verified by Jason Swallen of the U. S. National Herbarium.

Glyceria septentrionalis Hitchc. Swampy woods northeast of Gorham, Jackson County.
Glyceria striata (Lam.) Hitchc. At all of the stations; includes var. *stricta* (Scribn.) Fern.
Leersia lenticularis Michx. R6, R7; L3, L4; S1, S2.
Leersia oryzoides (L.) Sw. L1, L2; S1, S2.
Leersia virginica Willd. L1; S1, S2.
Leptochloa attenuata (Nutt.) Steud. R3, R4, R6.
Leptochloa fascicularis (Lam.) A. Gray. R4.
Leptochloa filiformis (Lam.) Beauv. R3, R4, R6, R7.
Muhlenbergia racemosa (Michx.) BSP. R3, R5, R7; S2.
Panicum agrostoides Spreng. At nearly all of the stations.
Panicum anceps Michx. At nearly all of the stations.
Panicum microcarpon Muhl. ex Ell. L1, L2, L3, L4; S1, S2.
Panicum polyanthes Schult. At most of the stations.
Panicum tennesseense Ashe. At all of the stations.
Paspalum circulare Nash. At all of the stations.
Paspalum dissectum L. Known from Perry and Pulaski Counties. Now possibly extinct.
Paspalum fluitans (Ell.) Kunth. L4; S1, S2.
Paspalum geminum Nash. S1, S2.
Paspalum glabratum (Engelm.) Mohr. Known only from low ground in Perry County.
Paspalum pubescens Muhl. ex Willd. At nearly all of the stations.
Phalaris arundinacea L. Low ground near Route 3, eight miles southwest of Murphysboro.
Tripsacum dactyloides L. S2.
Zizania aquatica L. Known only from Union County.

CYPERACEAE J. ST. HIL.

Carex comosa Boott. S2.
Carex crinita Lam. S2.
Carex cruscorvi Shuttlw. ex Kuntze. L3; S2.
Carex decomposita Muhl. S1, S2.
Carex emoryi Dewey. Known only from a stream flowing through Buffalo Hollow in Johnson County.
Carex frankii Kunth. In or near most of the swamps and lakes.
Carex granularis Muhl. ex Willd. L1, L3, L4; S1, S2.
Carex grayii Carey. In or near most of the swamps and lakes.
Carex hyalinolepis Steud. Mostly in wet roadside ditches.
Carex lacustris Willd. Known only from a roadside ditch in Jackson County.
Carex lanuginosa Michx. L3; S1.
Carex louisianica L. H. Bailey. S1.
Carex lupuliformis Sartw. ex Dewey. S1, S2.
Carex lupulina Muhl. ex Willd. In or near most of the swamps and lakes.
Carex lurida Wahl. In or near most of the swamps and lakes.
Carex muskingumensis Schw. L3.
Carex oxylepis Torr. and Hook. Known only from a swampy woods near Dongola, Union County.
Carex projecta Mack. Roadside ditch along Route 3, 8 miles southwest of Murphysboro.
Carex retrorsa Schw. S2.
Carex shortiaua Dewey. L1, L3; S1, S2.
Carex squarrosa L. In or near most of the swamps and lakes.
Carex stipata Muhl. ex Willd. L3; S1.
Carex subimpressa Clokey. Wet roadside ditch two miles south of Elkville, Jackson County.
Carex substricta (Kukenth.) Mack. in Rydb. Known only along Piney Creek, Randolph County.
Carex torta Boott. In rapid flowing streams in Jackson, Johnson, Pope, and Randolph Counties.
Carex typhina Michx. R5, R6; S1.
Carex vulpinoidea Michx. In all moist situations.
Cyperus acuminatus Torr. and Hook. At all of the river stations.
Cyperus aristatus Rottb. At all of the river stations.
Cyperus densicaespitosus Mattf. and Kukenth. in Kukenth. L1, L4.
Cyperus diandrus Torr. R4.
Cyperus engelmanni Steud. S2.
Cyperus erythrorhizos Muhl. At all of the river stations.
Cyperus esculentus L. At all of the stations.
Cyperus ferruginescens Boeck. At most of the river stations.
Cyperus flavescens L. L1.
Cyperus pseudovegetus Steud. Known from only a few areas.
Cyperus rivularis Kunth. L4.

Cyperus strigosus L. At all of the river stations.
Eleocharis acicularis (L.) Roem. and Schultes. L1, L2, L3; S2.
Eleocharis elliptica Kunth var. *compressa* Drapalik and Mohlenbrock. Hardin and Jackson Counties.
Eleocharis elliptica Kunth var. *elliptica*. Along rivers and streams, Alexander, Gallatin, and Jackson Counties.
Eleocharis erythropoda Steud. Known only from Massac County.
Eleocharis obtusa (Willd.) Schultes in Roem. and Schultes var. *detonsa* (A. Gray) Drapalik and Mohlenbrock.
Eleocharis obtusa (Willd.) Schultes in Roem. and Schultes var. *obtusa*. In most moist situations.
Eleocharis obtusa (Willd.) Schultes in Roem. and Schultes var. *ovata* (Roth) Drapalik and Mohlenbrock. Roadside ditch along Route 3 near Howardton, Jackson County.
Eleocharis palustris (L.) Roem. and Schultes. Known only along a roadside ditch, Route 3, Jackson and Alexander Counties.
Eleocharis quadrangulata (Michx.) Roem. and Schultes. L2; also Country Club Lake, Sparta, Randolph County and a temporary pond in Alexander County.
Eleocharis tenuis (Willd.) Schultes var. *verrucosa* Svenson. Common at all the stations.
Eleocharis wolfii (A. Gray) Patterson. Saline County.
Fimbristylis autumnalis (L.) Roem. and Schultes. At all of the river stations and a few of the lake stations.
Hemicarpha micrantha (Vahl) Pax in Engler. R3, R4.
Rhynchospora capitellata (Michx.) Vahl. Known only from along Bay Creek, Belle Smith Springs, Pope County.
Rhynchospora corniculata (Lam.) A. Gray. S1.
Scirpus acutus Muhl. ex Bigel. L2.
Scirpus americanus Pers. L1, L2.
Scirpus atrovirens Willd. In all the aquatic situations; includes var. *georgianus* (Harper) Fern.
Scirpus cyperinus (L.) Kunth. In most aquatic situations.
Scirpus fluviatilis (Torr.) A. Gray. Known only from the Country Club Lake, Sparta, Randolph County.
Scirpus rubricosus Fern. In a few of the aquatic situations, particularly near lakes.
Scirpus lineatus Michx. At most of the stations.
Scirpus polyphyllus Vahl. Swampy woods of Pope and Massac Counties.
Scirpus purshianus Fern. L4.
Scirpus validus Vahl. S1, S2.

ARACEAE NECKER

Acorus calamus L. L3, L4; S2.
Peltandra virginica (L.) Kunth. S1, S2.

LEMNACEAE DUMORT.

Lemna minor L. S2; also a number of temporary ponds in Jackson and Union Counties.
Lemna perpusilla Torr. S2; also a swampy woods in Alexander County.
Lemna trisulca L. S2.
Lemna valdiviana Phil. S2; also Lester Swamp in western Jackson County.
Spirodela polyrhiza (L.) Schleid. L1, L3; S2.
Wolffia columbiana Karst. L3.
Wolffia papulifera C. H. Thompson. S2.
Wolffia punctata Griseb. L3.
Wolffiella floridana (J. D. Sm.) C. H. Thompson. S2; also a strip mine pond in Perry County.

PONTEDERIACEAE RUIZ AND PAVON

Heteranthera reniformis Ruiz and Pavon. S2.
Pontederia cordata L. S2.

JUNCACEAE (VENT.) DUMORT.

Juncus acuminatus Michx. L1, L2, L3, L4.
Juncus biflorus Ell. R3.
Juncus brachycarpus Engelm. L1, L2, L4.
Juncus canadensis J. Gay ex Laharpe. S2.
Juncus effusus L. In most of the aquatic situations.
Juncus marginatus Rostk. L4; also along Route 3, Jackson County.
Juncus nodatus Coville. L2, L4.
Juncus torreyi Coville. In wet roadside ditches.

AMARYLLIDACEAE LINDLEY

Hymenocallis occidentalis (LeConte) Kunth. Low, swampy woods.

IRIDACEAE LINDLEY

Iris brevicaulis Raf. Low, swampy woods.
Iris fulva Ker. S1, S2.
Iris shrevei Small. At most of the stations.

ORCHIDACEAE LINDLEY

Habenaria peramoena A. Gray. Low, swampy woods.
Spiranthes cernua (L.) Rich. Low, swamp woods.

SAURURACEAE LINDLEY

Saururus cernuus L. In several of the aquatic situations.

SALICACEAE HORAN.

Populus deltoides Marsh. Common along rivers and streams.
Populus heterophylla L. In several of the aquatic situations.
Salix amygdaloides Anders. R3, R6, R7.
Salix caroliniana Michx. Around a lake, DuQuoin, Perry County.
Salix interior Rowlee. Along all the rivers and streams.
Salix nigra Marsh. At all of the stations.
Salix rigida Muhl. Along the Mississippi River near Cora, Jackson County.
Salix sericea Marsh. Along a few of the streams.

JUGLANDACEAE HORAN.

Carya aquatica (Michx. f.) Nutt. S1.

BETULACEAE AGARDH

Alnus serrulata (Ait.) Willd. Along clear streams, chiefly in the southeastern counties.
Betula nigra L. Along the rivers and streams.

FAGACEAE A. BR. EX ASCHERS.

Quercus lyrata Walt. Low, swampy woods; frequent along rivers.
Quercus michauxii Nutt. Along most of the rivers and streams.
Quercus palustris Muench. Along all of the rivers and streams.
Quercus phellos L. S1.

ULMACEAE MIRBEL

Celtis laevigata Willd. Along most of the streams and in the swamps.
Celtis occidentalis L. Along streams throughout southern Illinois.
Planera aquatica (Walt.) J. F. Gmelin. S1.

URTICACEAE REICHENB.

Pilea opaca (Lunell) Rydb. Low, swampy ground in extreme southwestern Jackson County.
Pilea pumila (L.) A. Gray. Low, moist ground throughout the area.
Urtica chamaedryoides Pursh. Low, swampy ground in Alexander and Jackson Counties.

ARISTOLOCHIACEAE JUSS. EX BLUME

Aristolochia nashii Kearney. S1.

POLYGONACEAE HORAN.

Brunnichia cirrhosa Banks ex Gaertn. S1.
Polygonum coccineum Muhl. ex Willd. S2.
Polygonum hydropiper L. In most of the aquatic situations.
Polygonum hydropiperoides Michx. In all of the aquatic situations.
Polygonum lapathifolium L. In all of the aquatic situations.
Polygonum opelousanum Riddell ex Small. S1, S2.
Polygonum pennsylvanicum L. In all of the aquatic situations.
Polygonum punctatum Ell. In all of the aquatic situations.
Polygonum sagittatum L. S2.
Polygonum setaceum Baldw. ex Ell. S1, S2.
Rumex fueginus Phil. R1; S2.
Rumex verticillatus L. In most of the aquatic situations.

CHENOPODIACEAE DUMORT.

Cycloloma atriplicifolium (Spreng.) Coult. R3, R4.

AMARANTHACEAE J. ST. HIL.

Acnida altissima (Riddell) Riddell ex Moq. Along all the rivers and most of the streams.
Acnida subnuda (S. Wats.) Standl. R3, R4, R5.
Acnida tamariscina (Nutt.) Wood. R6, R7.

RANUNCULACEAE JUSS.

Clematis crispa L. S1.
Ranunculus flabellaris Raf. ex Bigel. S1, S2.
Ranunculus laxicaulis (Torr. & Gray) Darby. S2.
Ranunculus pusillus Poir. ex Lam. S2.
Ranunculus septentrionalis Poir. in Lam. In low, swampy woods.

CABOMBACEAE A. GRAY

Brasenia schreberi Gmel. S1; also Lake Moses, Benton, Franklin County.
Cabomba caroliniana A. Gray. S2.

NELUMBONACEAE LINDLEY EX SMALL

Nelumbo lutea (Willd.) Pers. In most of the lakes and swamps.

NYMPHAEACEAE DC.

Nuphar advena (Ait.) Ait. f. In most of the lakes and swamps.
Nymphaea odorata Ait. S1, S2.

CERATOPHYLLACEAE A. GRAY

Ceratophyllum demersum L. In several of the local ponds.

CRUCIFERAE JUSS.

Cardamine arenicola Britt. Low, wet woods.
Cardamine bulbosa (Schreb.) BSP. Low, wet woods.
Cardamine pennsylvanica Muhl. ex Willd. Low, wet woods.
Nasturtium officinale R. Br. S2.
Neobeckia aquatica (A. Eaton) Greene. S2.
Rorippa islandica (Oeder) Borbas. In most of the aquatic situations.
Rorippa sessiliflora (Nutt.) Hitchc. Along many of the rivers and streams.
Rorippa sinuata (Nutt.) Hitchc. Along the banks of the Ohio River in Pope and Massac Counties.

CRASSULACEAE DC. IN LAM. AND DC.

Penthorum sedoides L. In most of the aquatic situations.

ESCALLONIACEAE DUMORT.

Itea virginica L. S1, S2.

HAMAMELIDACEAE LINDLEY

Liquidambar styraciflua L. Low, wet woods.

PLATANACEAE LINDLEY

Platanus occidentalis L. Along all the rivers and streams.

ROSACEAE B. JUSS.

Potentilla monspeliensis L. Along rivers and streams.
Potentilla paradoxa Nutt. ex Torr. & Gray. R3.
Rosa palustris Marsh. S1, S2.

LEGUMINOSAE P. F. GMEL.

Gleditsia aquatica Marsh. S1, S2.
Gleditsia triacanthos L. In many of the aquatic situations.
Psoralea onobrychis Nutt. Along Big Muddy River, Jackson County.
Sesbania exaltata (Raf.) Cory. Along Ohio River, Pulaski County. Adventive.
Wisteria macrostachya (Torr. & Gray) Robins. & Fern. in A. Gray. S1.

LINACEAE DUMORT.

Linum striatum Walt. Along streams in Jackson, Johnson, and Pope Counties.

BALSAMINACEAE DUMORT.

Impatiens biflora Walt. In low, wet woods.
Impatiens pallida Nutt. In low, wet woods.

EUPHORBIACEAE J. ST. HIL.

Chamaesyce geyeri (Engelm.) Small. R4.
Chamaesyce humistrata (Engelm.) Small. R3, R4, R6.
Chamaesyce serpens (HBK.) Small. R3, R4.
Tragia cordata Michx. Along Ohio River, Pope County.

CELASTRACEAE LINDLEY

Euonymus americanus L. S1.

AQUIFOLIACEAE (DC.) RICH.

Ilex decidua Walt. In many aquatic situations.

ACERACEAE J. ST. HIL.

Acer drummondii Hooker & Arnott. S1, S2.
Acer negundo L. Frequent along streams and rivers.
Acer rubrum L. In all moist situations.
Acer saccharinum L. Along all rivers and streams.

VITACEAE LINDLEY

Ampelopsis arborea (L.) Koehne. Along rivers in the southwestern counties.
Vitis aestivalis Michx. Along rivers and streams.
Vitis cinerea Engelm. ex Millardet. Along rivers and streams.

MALVACEAE NECKER

Hibiscus lasiocarpus Cav. In most of the aquatic situations.
Hibiscus militaris Cav. L2; S1, S2.
Hibiscus moscheutos L. L2.

HYPERICACEAE LINDLEY

Hypericum mutilum L. Along most of the rivers and streams.
Hypericum prolificum L. Along rocky streams.
Triadenum tubulosum (Walt.) Gleason. S1.
Triadenum walteri (Gmel.) Gleason. S1, S2.

LYTHRACEAE LINDLEY

Ammannia coccinea Rottb. In all aquatic situations.
Decodon verticillatus (L.) Ell. S1, S2.
Peplis diandra Nutt. ex DC. S2.
Rotala ramosior (L.) Koehne. In most of the aquatic situations.

ONAGRACEAE DUMORT.

Epilobium coloratum Muhl. ex Willd. R5.
Jussiaea decurrens (Walt.) DC. S1, S2.
Jussiaea diffusa Forskal. In most ponds and lakes.
Jussiaea leptocarpa Nutt. R3, R6.
Ludwigia alternifolia L. R4, R5, R6; S1, S2.
Ludwigia glandulosa Walt. S1.
Ludwigia palustris (L.) Ell. Along all rivers and streams.
Ludwigia polycarpa Short & Peter. S1.

HALORAGACEAE HORAN.

Myriophyllum heterophyllum Michx. The "Lagoon," Riverside Park, Murphysboro.
Myriophyllum pinnatum (Walt.) BSP. Country Club Lake, Sparta, Randolph County.
Myriophyllum verticillatum L. L3.
Proserpinaca palustris L. S1, S2.

CALLITRICHACEAE LINDLEY

Callitriche heterophylla Pursh. S1, S2.
Callitriche palustris L. S1, S2.

NYSSACEAE ENDL.

Nyssa aquatica L. S1.

UMBELLIFERAE SCOP.

Cicuta maculata L. In many moist situations.
Heracleum lanatum Michx. Along streams, Jackson and Pope Counties.
Oxypolis rigidior (L.) Raf. S1.
Ptilimnium costatum (Ell.) Raf. L3; S1, S2.
Ptilimnium nuttallii (DC.) Britton. In a swampy area near Makanda, Jackson County.
Sium suave Walt. L3; S1, S2.

STYRACACEAE A. DC. IN DC.

Styrax americana Lam. S1.

PRIMULACEAE VENT.

Hottonia inflata Ell. S1, S2.
Lysimachia ciliata L. Along most of our streams.
Lysimachia nummularia L. In numerous aquatic situations. Adventive.
Samolus parviflorus Raf. In moist soil throughout southern Illinois.

OLEACEAE POIR. IN LAM.

Forestiera acuminata (Michx.) Poir. Along rivers and streams and in swamps.
Fraxinus pennsylvanica Marsh. Low, swampy ground.
Fraxinus tomentosa Michx. f. Low, swampy ground; often in swamps.

APOCYNACEAE LINDLEY

Trachelospermum difforme (Walt.) A. Gray. S1.

ASCLEPIADACEAE LINDLEY

Asclepias incarnata L. In most aquatic situations.
Asclepias perennis Walt. In low woods; often in swamps.

CONVOLVULACEAE VENT.

Cuscuta compacta Engelm. S2.

HYDROPHYLLACEAE LINDLEY

Hydrolea affinis A. Gray. S1, S2.

VERBENACEAE JUSS.

Phyla lanceolata (Michx.) Greene. In most aquatic situations.

LABIATAE B. JUSS.

Lycopus americanus Muhl. ex Bart. In most moist situations.
Lycopus rubellus Moench. S1, S2.
Lycopus virginicus L. In nearly all the aquatic situations.
Scutellaria lateriflora L. Along rivers and streams.
Teucrium canadense L. Moist soil throughout southern Illinois.

SCROPHULARIACEAE LINDLEY

Bacopa rotundifolia (Michx.) Wettst. in Engler & Prantl. In a few of our ponds and streams.
Chelone glabra L. Low, wet ground.
Chelone obliqua L. Low, wet ground.
Gerardia tenuifolia Vahl. Along all the rivers.
Gratiola neglecta Torr. In all aquatic situations.
Gratiola virginiana L. Around lakes and in swamps.
Leucospora multifida (Michx.) Nutt. Along most rivers and streams.
Lindernia anagallidea (Michx.) Pennell. In all aquatic situations.
Lindernia dubia (L.) Pennell. In all aquatic situations.
Mimulus alatus Ait. In nearly all moist situations.
Mimulus ringens L. R7.

ACANTHACEAE J. ST. HIL.

Dianthera americana L. In a variety of aquatic situations.
Dianthera lanceolata (Chapm.) Small. S1.

LENTIBULARIACEAE LINDLEY

Utricularia gibba L. L2; S2.
Utricularia vulgaris L. S2.

RUBIACEAE B. JUSS.

Cephalanthus occidentalis L. In all aquatic situations.
Diodia virginiana L. R3, R6.
Galium obtusum Bigel. Wet soil throughout southern Illinois.
Galium triflorum Michx. S2.
Spermacoce glabra Michx. In many moist situations.

LOBELIACEAE JUSS.

Lobelia cardinalis L. Wet, swampy ground.
Lobelia puberula Michx. Wet ground, mostly along streams.
Lobelia siphilitica L. Wet ground, mostly along streams.

VALERIANACEAE BATSCH.

Valerianella radiata (L.) Durf. At all the aquatic stations.

COMPOSITAE P. F. GMEL.

Artemisia gnaphalodes Nutt. Along Ohio River, Pope County. Adventive.
Aster laevis L. R3, R4.
Aster ontarionis Wieg. R3, R4.
Aster praealtus Poir. in Lam. In most of the river and stream situations.
Aster simplex Willd. R5.
Bidens aristosa (Michx.) Britt. Common in all moist areas.
Bidens cernua L. R5.
Bidens comosa (A. Gray) Wieg. Wet ditch west of Ware, Union County.
Bidens connata Muhl. ex Willd. S2.
Bidens coronata (L.) Britt. L2.
Bidens discoidea (Torr. & Gray) Britt. S2: also Snyder's Lake, Jackson County.
Bidens frondosa L. S2; also a strip mine pond near Cambria, Williamson County.
Bidens polylepis Blake. S2.
Bidens vulgata Greene. L1; S2.
Eclipta alba (L.) Hassk. In all aquatic situations.
Eupatorium altissimum L. R3, R4, R5.
Eupatorium coelestinum L. In a variety of aquatic situations.
Eupatorium fistulosum Barratt. Low, swampy ground near Olive Branch, Alexander County.
Eupatorium maculatum L. Along streams.
Eupatorium perfoliatum L. S1.
Helenium autumnale L. R4, R5.
Melanthera hastata (Walt.) Michx. R7.
Mikania scandens (L.) Willd. S1.
Pluchea camphorata (L.) DC. In most of the aquatic situations.
Senecio aureus L. In a few aquatic situations.
Senecio glabellus Poir. in Lam. Common along rivers and streams.
Solidago patula Muhl. ex Willd. L2.
Solidago rugosa Mill. L1.
Xanthium chinense Mill. Common along rivers.
Xanthium commune Britt. R3.

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