

The Vascular Flora of Lovets Pond, Jackson County, Illinois

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ABSTRACT

Lovets Pond is a wetland ecosystem located in the Mississippi River floodplain of Jackson County, Illinois. Systematic collecting of the vascular flora at the site reveal 328 species, subspecies, and varieties, representing 199 genera and 86 families. Six natural community types are found in the 60 ha ecosystem: pond, shrub swamp, true swamp, marsh, wet-mesic floodplain forest, and successional field. The pond, shrub swamp, true swamp, and marsh communities at the site are rare in the region. The present natural character of Lovets Pond is similar to the earliest known presettlement descriptions. The rarity of the wetland community types and the high natural quality of the site are two major factors in distinguishing Lovets Pond as a valuable natural resource for the region.

INTRODUCTION

North of the coastal floodplain and south of the confluence of the Mississippi and Missouri rivers is the broad Mississippi River floodplain, historically referred to as the "American Bottoms." Lovets Pond is one of a small number of natural pond ecosystems still extant in this vast floodplain. The almost complete elimination of the once common wetlands in this region is due largely to extensive wetland drainage and land clearing for agricultural use. The only other significant natural ponds that remain are at the Larue Swamp-Wolf Lake region in Union County and at the Levee Lake site in Alexander County. Prior to this study, the Lovets Pond site in Jackson County had received little attention from biologists, and the flora at the site had never been systematically surveyed.

The primary objectives of this study are to compile a comprehensive list of the vascular flora found at Lovets Pond, to report a representative habitat for each taxon, and to qualitatively describe the natural communities at the site.

THE STUDY AREA

Lovets Pond is located approximately 10 km from the Mississippi River, near the mideastern border of Jackson County, Illinois. The boundary of the study area was established to include all natural communities associated with the pond proper (Fig. 1). The pond proper occupies about 25 ha; the surrounding floodplain forest, swamp, and marsh increase the ecosystem to approximately 60 ha. The natural community complex is completely surrounded by farmland. The Kinkaid Hills are 0.8 km to the north of the pond and are the source of three intermittent streams that enter the study area. When water levels are high, the pond drains into Glenn Creek at the southwestern end of the site.

The Mississippi Valley region encompassing Lovets Pond was classified by Schwegman (1973) as the Southern Section of the Lower Mississippi River Bottomlands Division. The section was historically characterized by a broad alluvial floodplain with river meander scars, oxbow lakes, natural levees, and terrace remnants. Lovets Pond is located in one of the abandoned meander bends of the Mississippi River at approximately 109 m above sea level (Harris et al., 1977). A linear ridge at the 111-m contour parallels the pond to the north. Slightly higher ground separates the linear ridge from the adjacent Kinkaid Hills.

The study area is underlain by limestone of Mississippian age (Willman et al., 1967). The parent material at the site is alluvium, primarily clay and silt. The Darwin, Hurst, Birds, Karnak, and Cairo series of soils occur on the site. The soils are poorly drained, silty clays to a depth of approximately 1.5 m (Soil Survey of Jackson County, Illinois, 1979).

The climate of the region is temperate with a mean annual temperature of 13.8°C at Carbondale, approximately 25 km east of the study area (Soil Survey of Jackson County, Illinois, 1979). The coldest month is usually January with an average temperature of 0.7°C. July, with an average temperature of 25.6°C, is the warmest month. The mean annual precipitation is 107.8 cm, with an average of 7 cm in January, the driest month, and 11.7 cm in May, the wettest month. There is an average of 186 frost-free days.

The presettlement vegetation of the Lovets Pond area can be partially reconstructed using the eyewitness descriptions of the landscape recorded in the Public Land Survey field notebooks (Public Land Survey 1804-1850). According to the surveyors of 1807-1810, the immediate vicinity of Lovets Pond was dominated by an interconnecting network of lakes, ponds, and swamps (Fig. 2). The ponds and lakes were flat-bottomed, relatively shallow in most areas, and open with little or no timber. Dense, shrubby thickets were prevalent along the edges. On the land adjoining the ponded areas were wet woods and swamps, where periodic flooding probably had considerable influence on the structure and composition of timber. Bottomland timber was reported to be primarily ash (*Fraxinus* sp.), elm (*Ulmus* sp.), pin oak (*Quercus palustris*), overcup oak (*Quercus lyrata*), hackberry (*Celtis occidentalis*), hickory (*Carya* sp.), maple (*Acer* sp.) and locust (*Gleditsia* sp.). Common understory species identified were ironwood (probably *Carpinus caroliniana*), spice (*Lindera benzoin* or *Sassafras albidum*) and pawpaw (*Asimina triloba*). Dividing the low, wet areas were slightly higher linear ridges, characterized by dense growths of timber and impassible underbrush.

Today the natural vegetation at Lovets Pond represents an isolated island refuge in a vast expanse of cornfields. The extensive natural wetland that was continuous with Lovets Pond has been extirpated by human activity. Fortunately, the remaining small wetland does not show the direct effects of extensive agricultural encroachment; the water is clear, the aquatic vegetation is dense, and the bottom is firm. The pond's close proximity to the Kinkaid Hills watershed and the presence of better-drained soils to the immediate north are two factors that have probably helped prevent a heavy silt load from entering the pond.

METHODS AND MATERIALS

A comprehensive plant list was compiled by traversing the study area and collecting a representative specimen of each vascular taxon encountered. After preliminary identification in the field, the specimens were pressed, dried, and a final determination made later in the laboratory. The habitat and general abundance of each taxon were noted in the field. The study site was visited about twice a week during the 1985 growing season; periodic trips were made again during the 1986 season but less frequently. Voucher specimens were deposited in the herbarium, Department of Botany, Southern Illinois University at Carbondale, and in the author's personal collection.

RESULTS AND DISCUSSION

The known vascular flora of the Lovets Pond study area consists of 328 species, subspecies, and varieties representing 199 genera and 86 families. Included are 4 pteridophytes, 96 monocots, and 228 dicots. The 4 largest families, the Asteraceae (39 species), Poaceae (36), Cyperaceae (30), and Polygonaceae (11) account for 35% of the species. *Carex* is the largest genus with 20 species, followed by *Polygonum* (8), and *Bidens* (6). The 60 woody species, including 33 trees, 18 shrubs and small trees, and 9 woody vines, make up 18% of the flora. Thirty-eight (12%) of the total number of species are nonnative; however, most of these were collected from narrow, disturbed habitats at the periphery of the study area.

Eleven plant species designated as rare or very rare in Illinois by Mohlenbrock (1986) are found at Lovets Pond: *Ammannia auriculata*, *Aster prenanthoides*, *Carex louisianica*, *Carex socialis*, *Fraxinus profunda*, *Gleditsia aquatica*, *Limnobia spongia*, *Penstemon alluviorum*, *Poa angustifolia*, *Ranunculus carolinianus*, and *Rorippa islandica*. At the time of collection, five of these species (*Aster prenanthoides*, *Carex louisianica*, *Carex socialis*, *Penstemon alluviorum*, and *Poa angustifolia*) were previously unreported from Jackson County, Illinois (Mohlenbrock and Ladd, 1978). Additionally, two species not rare in the state, *Decodon verticillatus* and *Triadenum walteri*, were new records for the county. *Carex socialis* was listed by White (1978) as an "exceptional feature." Elements given this designation are considered very rare in Illinois and add significantly to the natural quality of an area. The occurrence of *Aster prenanthoides* at Lovets Pond is approximately 300 km south of the nearest known Illinois location.

Based on a natural classification scheme for Illinois developed by White and Madany (1978), six communities are present within the study area: pond, shrub swamp, true swamp, marsh, wet-mesic floodplain forest, and successional field. The successional field and floodplain forest communities are extremely common in the Lower Mississippi River Bottomlands Division. The wetland communities (marsh, true swamp, shrub swamp, and pond) are all extremely rare. Of the 157,000 total ha in the division, no high quality swamp or marsh communities and only 75 ha of high quality pond and shrub swamp communities were documented as extant in a 1976 survey (White, 1978).

A pond community is defined as a small, still, permanent body of water usually shallow enough to allow rooted aquatic plants across most of it (White and Madany, 1978). Ponds are distinguished from other wetlands by the general lack of emergent woody or graminoid vegetation. The pond community in the Lovets Pond study area is characterized by a broad area of "open water" dominated by *Nuphar luteum ssp. macrophyllum*. Distributed randomly within the *Nuphar* are dense mats of *Polygonum amphibium* and *Polygonum hydropiperoides*. Floating plants, including a rich variety of duckweeds, are increasingly apparent in the pond as the summer season progresses. The floating assemblage is composed of *Azolla mexicana*, *Lemna minor*, *Lemna obscura*, *Limnobium spongia*, *Spirodela polyrhiza*, *Wolffia braziliensis*, *Wolffia columbiana*, and *Wolffiella gladiata*. Submerged close to the surface in most areas of the pond is a dense layer of *Ceratophyllum demersum*. Extending irregularly into the ponded zone is the shrubby *Cephalanthus occidentalis*.

A shrub swamp community is a body of water dominated by woody plants consisting of at least 50% coverage by shrubs and less than 20% coverage by trees (White and Madany, 1978). The shrub swamp community at Lovets Pond forms a dense thicket around the ponded zone. Standing water is present throughout this community most of the year. *Cephalanthus occidentalis* is the dominant shrub species in this community. Shrubby species occasionally associated with the *Cephalanthus*, particularly in the shallow water areas, are *Ilex decidua*, *Cornus stolonifera*, *Carpinus caroliniana*, and *Salix rigida*. *Salix nigra* is a conspicuous tree species scattered throughout.

Very little herbaceous growth is found below the heavily shaded shrub thicket. A number of herbaceous species are found, however, in scattered openings in the brush, including *Alisma plantago-aquatica* var. *parviflorum*, *Carex grayi*, *Iris shrevei*, *Mimulus alatus*, *Nuphar luteum ssp. macrophyllum*, *Peltandra virginica*, *Polygonum pensylvanicum* var. *laevigatum*, *Polygonum punctatum*, and *Rumex verticillatus*. Less commonly encountered plant species found in these openings are *Carex crinita*, *Carex louisianica*, and *Penstemon alluviorum*. As the summer season progresses, floating plants (primarily duckweeds) dominate on the water's surface, as is the case in all wetland communities at Lovets Pond. An almost monotypic band of *Saururus cernuus* grows in shallow water or muddy ground at the periphery of the shrub swamp community.

A true swamp community is defined by White and Madany (1978) as a forested, permanent or semipermanent body of water. The true swamp at Lovets Pond is only about 2 ha in size and closely borders the shrub swamp and pond communities at the site. The trees are young to mature in age; numerous fallen trees and logs are scattered on the swamp floor. Shallow water was present in

the community during most of the year in 1985 and 1986. An assemblage of water-tolerant tree species characterize the true swamp: *Acer rubrum*, *Fraxinus profunda*, *Gleditsia aquatica*, *Populus heterophylla*, and *Salix nigra*. In shallow water or muddy ground *Quercus palustris* is common. Two shrubs occurring occasionally in the true swamp are *Cephalanthus occidentalis* and *Ilex decidua*.

The understory of the true swamp is dominated by dense stands of *Peltandra virginica* about 1.5 m in height. Other herbaceous species associated with the *Peltandra* include *Alisma plantago-aquatica* var. *parviflorum*, *Bidens cernua*, *Decodon verticillatus*, *Rumex verticillatus*, and *Saururus cernuus*. *Iris shrevei* occurs in small monotypic colonies in some areas. *Cuscuta gronovii* and *C. polygonorum* form a blanket over much of the herbaceous layer. Floating on the water's surface in the true swamp are *Azolla mexicana*, *Lemna minor*, *Spirodela polyrhiza*, *Wolffia braziliensis*, *Wolffia columbiana*, and in an isolated area, *Ranunculus flabellaris*.

A marsh community is characterized by tall graminoid plants and water near or above the ground surface for most of the year (White and Madany, 1978). The marsh community at Lovets Pond is approximately 2 ha in size and is bordered by cornfield. Approximately half of the marsh community has standing water present throughout the year. Except during the driest periods, standing water in the marsh is continuous with the nearby swamp and pond. The deepest areas of the marsh are either devoid of emergent vegetation or contain isolated clumps of *Peltandra virginica*. During the early spring months submerged plants are evident in the open water, including *Callitriche heterophylla*, *Ceratophyllum demersum*, and *Potamogeton pusillus*. By summer, duckweeds, *Limnobium spongia*, and *Ludwigia peploides* ssp. *glabrescens* completely cover the water surface.

A dense growth of graminoid plants, 1.5 m to 2 m tall, is prevalent at the periphery of the deep water zones in the marsh community. *Sparganium eurycarpum* is the dominant plant in this shallow water region and throughout the moist ground. Occurring in large circular colonies within the *Sparganium* is *Scirpus tabernaemontanii*. Also associated with the *Sparganium* are *Alisma plantago-aquatica* var. *parviflorum*, *Carex hyalinolepis*, *Carex lurida*, *Eleocharis macrostachya*, *Hibiscus lasiocarpus*, *Leersia oryzoides*, *Polygonum amphibium*, *Polygonum hydropiperoides*, *Sagittaria latifolia*, *Sium suave*, and *Typha latifolia*.

Wet-mesic floodplain forest communities are found on the floodplains of streams and are determined by the frequency and duration of flooding (White and Madany, 1978). The forests are usually a mixture of trees with no clear dominants. A diverse assemblage of tree species characterizes the overstory in the floodplain forest at Lovets Pond, including *Acer saccharinum*, *Carya cordiformis*, *Carya ovata*, *Celtis laevigata*, *Celtis occidentalis*, *Fraxinus americana*, *Fraxinus pennsylvanica* var. *subintegerrima*, *Gleditsia triacanthos*, *Quercus macrocarpa*, *Quercus michauxii*, *Quercus palustris*, *Ulmus americana*, and *Ulmus rubra*. Subcanopy and tall understory species found in the community are *Acer negundo*, *Asimina triloba*, *Cornus stolonifera*, *Ilex decidua*, *Lindera benzoin*, and *Ulmus alata*. Woody vines are common throughout and include *Ampelopsis cordata*, *Smilax hispida*, *Smilax rotundifolia*, *Toxicodendron radicans*, and *Vitis cinerea*.

During the spring months a monotypic colony of *Ranunculus carolinianus* is the dominant herbaceous species in the wettest zones of the floodplain forest. On the slightly drier ground in spring is a rich assemblage of wildflowers, including *Claytonia virginica*, *Corydalis flavula*, *Delphinium tricorne*, *Dentaria laciniata*, *Erythronium albidum*, *Sanguinaria canadensis*, *Trillium recurvatum*, and *Viola obliqua*. Characteristic herbaceous plants in the summer include *Boehmeria cylindrica*, *Cryptotaenia canadensis*, *Eclipta prostrata*, *Impatiens capensis*, *Lysimachia ciliata*, *Pilea pumila*, and *Ruellia strepens*. Graminoids evident in the summer are *Carex convoluta*, *Carex grayii*, *Carex lupulina*, *Carex projecta*, *Cinna arundinacea*, *Glyceria striata*, and *Leersia lenticularis*. In autumn herbs such as *Aster vimineus*, *Aster simplex*, *Bidens tripartita*, *Lobelia cardinalis*, *Lobelia siphilitica*, *Polygonum virginianum*, and *Verbesina alternifolia* are commonly encountered.

A successional field community includes any formerly disturbed open land. Examples are abandoned fields and pastures, roadsides, and vacant lots. The unifying factor is human disturbance (White and Madany, 1978). At Lovets Pond the highly disturbed areas are narrow fields and roadsides at the periphery of the study area. The flora in these habitats is a mixture of both alien and native, disturbance-adapted species. Commonly encountered woody species are *Cornus drummondii*, *Quercus imbricaria*, *Rhus glabra*, *Rosa multiflora*, *Rubus allegheniensis*, and *Sassafras albidum*. A large number of grass species characterize the successional field community, including *Echinochloa crus-galli*, *Elymus virginicus*, *Festuca pratensis*, *Poa pratensis*, *Setaria faberi*, and *S. viridis*. *Ambrosia artemisiifolia*, *Ambrosia trifida*, *Bidens aristosa* var. *retorsa*, *Cirsium discolor*, *Erigeron annuus*, *E. strigosus*, and *Xanthium strumarium* var. *glabratum* are representative of the composites. Additional herbaceous species common in the disturbed areas are *Dianthus armeria*, *Ipomoea lacunosa*, *Juncus interior*, *J. tenuis*, *Lamium amplexicaule*, *Lonicera japonica*, *Ranunculus abortivus*, and *Rumex crispus*.

A large majority of the plant species listed for this site are representative of natural ecosystems. The aquatic community assemblages are considered rare in this natural division dominated by agriculture. Despite the surrounding agricultural encroachment, the character of the remaining Lovets Pond ecosystem is largely consistent with the earliest presettlement descriptions. Thus two major factors in distinguishing a natural area are met: (1) the site is of high natural quality and (2) the community(s) and/or species present are of significant rarity. Lovets Pond is a rare and valuable natural resource for the region.

ANNOTATED CHECKLIST

The nomenclature and sequence of taxa follow Mohlenbrock (1986). Following the binomial and authority is a brief habitat description and a statement of relative abundance for each taxon. The natural community designation pertains only to the voucher specimen and does not reflect the species occurrence in other communities. An effort was made, however, to collect the voucher specimen from the species' most typical natural community. The natural communities are abbreviated in the following list as follows: PO = pond, SH =

shrub swamp, TR = true swamp, MA = marsh, FL = wet-mesic floodplain forest, and SU = successional field. The relative abundance (based on observations and collections) is indicated in the following list as common, occasional, or rare. The designations refer to the species abundance in suitable habitat. The following abbreviations are used to represent abundance: com. = common, occ. = occasional, and rar. = rare.

- OPHIOGLOSSACEAE
Botrychium dissectum Spreng. var. *obliquum* (Muhl.) Clute. FL, occ.
- ASPLENIACEAE
Onoclea sensibilis L. FL, occ.
- Polystichum acrostichoides* (Michx.) Schott. FL, rar.
- SALVINIACEAE
Azolla mexicana Presl. PO, com.
- TYPHACEAE
Typha latifolia L. MA, occ.
- SPARGANIACEAE
Sparganium eurycarpum Engelm. MA, com.
- POTAMOGETONACEAE
Potamogeton pusillus L. PO, com.
- ALISMACEAE
Sagittaria latifolia Willd. MA, com.
Alisma plantago-aquatica L. var. *parviflorum* (Pursh) Torr. SH, com.
- HYDROCHARITACEAE
Limnobium spongia (Bosc.) Steud. PO, com.
- POACEAE
Bromus japonicus Thunb. SU, occ.
Bromus pubescens Muhl. FL, occ.
Bromus tectorum L. SU, occ.
Festuca pratensis Huds. SU, com.
Festuca obtusa Biehler. FL, occ.
Poa annua L. SU, occ.
Poa pratensis L. SU, occ.
Poa angustifolia L. FL, rar.
- Dactylis glomerata* L. SU, com.
Agrostis alba L. SU, occ.
Cinna arundinacea L. FL, occ.
Phleum pratense L. SU, occ.
Elymus virginicus L. SU, com.
Elymus riparius Wiegand. FL, occ.
Elymus villosus Muhl. FL, occ.
Hordeum pusillum Nutt. SU, occ.
Glyceria striata (Lam.) Hitchcok. FL, com.
Digitaria sanguinalis (L.) Scop. SU, occ.
Paspalum laeve Michx. SU, occ.
Paspalum pubiflorum Rupr. var. *glabrum* Vasey. SU, occ.
Panicum dichotomiflorum Michx. SU, occ.
Dichanthelium acuminatum (Sw.) Gould & Clark. var. *fasciculatum* (Torr.) Freckm. MA, occ.
Dichanthelium laxiflorum (Lam.) Gould. FL, occ.
Dichanthelium clandestinum (L.) Gould. FL, occ.
Echinochloa crus-galli (L.) Beauv. SU, com.
Echinochloa crus-galli (L.) Beauv. var. *frumentacea* (Roxb.) W. Wight. SU, rar.

- Setaria glauca* (L.) Beauv. SU, occ.
Setaria faberi Herrm. SU, com.
Setaria viridis (L.) Beauv. SU, com.
Eragrostis hypnoides (Lam.) BSP. MA, rar.
Eragrostis cilianensis (All.) Mosher. SU, occ.
Arundinaria gigantea (Walt.) Chapm. FL, occ.
Leersia lenticularis Michx. FL, com.
Leersia oryzoides (L.) Swartz. MA, occ.
Leersia virginica Willd. FL, occ.
Chasmanthium latifolium (Michx.) Yates. FL, occ.
- CYPERACEAE
- Cyperus aristatus* Rottb. FL, rar.
Cyperus esculentus L. SU, com.
Cyperus strigosus L. SU, com.
Eleocharis smallii Britt. MA, occ.
Eleocharis macrostachya Britt. MA, com.
Eleocharis obtusa (Willd.) Schult. var. *obtusa* FL, com.
Eleocharis obtusa (Willd.) Schult. var. *detonsa* (Gray) Drap. & Mohlenbr. MA, occ.
Scirpus tabernaemontanii K. C. Gmel. MA, com.
Scirpus atrovirens Willd. MA, com.
Scirpus cyperinus (L.) Kunth. MA, rar.
Carex convoluta Mack. FL, com.
Carex socialis Mohlenbr. & Schwegm. FL, occ.
Carex vulpinoidea Michx. MA, com.
Carex conjuncta Boott. FL, rar.
Carex crus-corvi Shuttlew. MA, com.
Carex muskingumensis Schwein. TR, com.
Carex scoparia Willd. MA, com.
Carex tribuloides Wahlenb. FL, occ.
Carex projecta Mack. FL, com.
Carex crinita Lam. SH, rar.
Carex shortiana Dewey. MA, occ.
Carex granularis Willd. FL, rar.
Carex frankii Kunth. MA, occ.
Carex squarrosa L. Sedge. SU, occ.
Carex typhina Michx. MA, occ.
Carex hyalinolepis Steud. MA, com.
Carex lurida Wahlenb. MA, occ.
Carex grayii Carey. FL, com.
Carex louisianica Bailey. SH, rar.
Carex lupulina Willd. FL, com.
- ARACEAE
- Peltandra virginica* (L.) Schott. TR, com.
Arisaema dracontium (L.) Schott. FL, rar.
- LEMNACEAE
- Spirodela polyrhiza* (L.) Schleiden. PO, com.
Lemna minor L. PO, com.
Lemna obscura (Austin) Daubs. PO, com.
- Wolffiella gladiata* (Hegelm.) Hegelm. PO, com.
Wolffia braziliensis Weddell. PO, com.
Wolffia columbiana Karst. PO, com.
- COMMELINACEAE
- Tradescantia subaspera* Ker. FL, occ.
- JUNCACEAE
- Juncus effusus* L. var. *solutus* Fern. & Wieg. MA, rar.
Juncus acuminatus Michx. MA, com.
Juncus tenuis Willd. SU, com.
Juncus interior Wieg. SU, com.
- LILIACEAE
- Allium canadense* L. FL, occ.
Trillium recurvatum Beck. FL, com.
Erythronium albidum Nutt. FL, occ.
Polygonatum commutatum (Schult.) A. Dietr. SU, occ.
- SMILACACEAE
- Smilax bona-nox* L. FL, rar.
Smilax rotundifolia L. FL, com.
Smilax hispida Muhl. FL, occ.
- DIOSCOREACEAE
- Dioscorea villosa* L. FL, occ.
Dioscorea quaternata Walt. J. F. Gmel. FL, rar.
- IRIDACEAE
- Iris shrevei* Small. TR, com.
Sisyrinchium anagustifolium Mill. FL, occ.
- SAURURACEAE
- Saururus cernuus* L. TR, com.
- SALICACEAE
- Salix nigra* Marsh. SH, com.
Salix rigida Muhl. SH, com.
Populus heterophylla L. TR, com.
- JUGLANDACEAE
- Juglans nigra* L. FL, rar.
Carya illinoensis (Wang.) K. Koch. FL, occ.
Carya cordiformis (Wang.) K. Koch. FL, occ.
Carya ovata (Mill.) K. Koch. FL, occ.
Carya laciniosa (Michx.) Loud. FL, occ.
Carpinus caroliniana Walt. FL, rar.
- FAGACEAE
- Quercus imbricaria* Michx. SU, occ.
Quercus palustris Muenchh. FL, com.
Quercus michauxii Nutt. FL, com.
Quercus macrocarpa Michx. FL, com.
Quercus lyrata Walt. FL, rar.
- ULMACEAE
- Ulmus rubra* Muhl. FL, occ.

- Ulmus americana* L. FL, occ.
Ulmus alata Michx. FL, occ.
Celtis occidentalis L. FL, com.
Celtis laevigata Willd. FL, com.
 MORACEAE
Morus rubra L. FL, occ.
 URTICACEAE
Boehmeria cylindrica (L.) Sw. FL, com.
Pilea pumila (L.) Gray. FL, com.
 ARISTOLOCHIACEAE
Asarum canadense L. var. *reflexum* (Bickn.)
 Robins. FL, com.
 POLYGONACEAE
Rumex crispus L. SU, occ.
Rumex altissimus Wood. MA, occ.
Rumex verticillatus L. TR, com.
Polygonum virginianum L. FL, occ.
Polygonum punctatum Ell. SH, com.
Polygonum setaceum Baldw var. *interjectum*
 Fern. FL, occ.
Polygonum hydropiperoides Michx. PO, com.
Polygonum amphibium L. PO, com.
Polygonum lapathifolium L. SH, com.
Polygonum pensylvanicum L. var. *durum*
 Standford. SH, rar.
Polygonum pensylvanicum L. var. *laevigatum*
 Fern. SH, occ.
 CHENOPODIACEAE
Chenopodium album L. SU, occ.
 AMARANTHACEAE
Amaranthus rudis Sauer. MA, rar.
 PHYTOLACCACEAE
Phytolacca americana L. SU, occ.
 PORTULACACEAE
Portulaca oleracea L. SU, rar.
Claytonia virginica L. FL, com.
 CARYOPHYLLACEAE
Cerastium vulgatum L. SU, occ.
Dianthus armeria L. SU, occ.
 CERATOPHYLLACEAE
Ceratophyllum demersum L. PO, com.
 NYMPHAEACEAE
Nuphar luteum (L.) Sibth. & Smith ssp.
macrophyllum (Dur.) Beal. PO, com.
 NELUMBONACEAE
Nelumbo lutea (Willd.) Pers. MA, rar.
 RANUNCULACEAE
Ranunculus laxicaulis (Torr. & Gray) Darby.
 MA, com.
Ranunculus sceleratus L. MA, com.
Ranunculus abortivus L. SU, occ.
Ranunculus flabellaris Raf. TR, rar.
Ranunculus carolinianus DC. FL, com.
Delphinium tricorne Michx. FL, com.
Clematis pitcheri Torr. & Gray. FL, rar.
 BERBERIDACEAE
Podophyllum peltatum L. FL, occ.
 MENISPERMACEAE
Menispermum canadense L. FL, com.
 MAGNOLIACEAE
Liriodendron tulipifera L. SU, rar.
 ANNONACEAE
Asimina triloba (L.) Dunal. FL, com.
 LAURACEAE
Sassafras albidum (Nutt.) Ness. SU,
 occ.
Lindera benzoin (L.) Blume. FL, occ.
 PAPAVERACEAE
Sanguinaria canadensis L. FL, com.
Corydalis flavula (Raf.) DC. FL, com.
 BRASSICACEAE
Dentaria laciniata Muhl. FL, occ.
Capsella bursa-pastoris (L.) Medic.
 SU, rar.
Cardamine bulbosa (Schreb.) BSP. FL,
 com.
Cardamine pensylvanica Muhl. MA,
 com.
Thlaspi arvense L. SU, occ.
Alliaria petiolata (Bieb.) Cavara &
 Grande. SU, rar.
Rorippa islandica (Oeder) Borbas. MA,
 occ.
 SAXIFRAGACEAE
Penthorum sedoides L. MA, com.
 HAMMAMELIDACEAE
Liquidambar styraciflua L. FL, occ.
 PLATANACEAE
Platanus occidentalis L. FL, rar.
 ROSACEAE
Prunus serotina Ehrh. FL, rar.
Crataegus cf. *viridis* L. FL, rar.
Crataegus mollis (Torr. & Gray)
 Scheele. FL, rar.
Rubus occidentalis L. SU, occ.
Rubus allegheniensis Porter. SU, com.
Rosa setigera Michx. var. *tomentosa*
 Torr. & Gray. SU, com.
Rosa multiflora Thunb. SU, occ.
Potentilla norvegica L. SU, rar.
Geum canadense Jacq. FL, occ.
 CAESALPINIACEAE
Cassia fasciculata Michx. SU, occ.
Cercis canadensis L. SU, occ.
Gleditsia triacanthos L. FL, com.
Gleditsia aquatica Marsh. TR, com.
 FABACEAE
Vicia villosa Roth. SU, occ.

- Lathyrus latifolius* L. SU, rar.
Trifolium campestre Schreb. SU, occ.
Trifolium pratense L. SU, com.
Trifolium repens L. SU, com.
Trifolium hybridum L. SU, occ.
Medicago lupulina L. SU, com.
Kummerowia striata (Thunb.) Schindl. SU, occ.
Desmodium canescens (L.) DC. SU, occ.
Desmodium pauciflorum (Nutt.) DC. FL, rar.
OXALIDACEAE
Oxalis stricta L. FL, occ.
GERANIACEAE
Geranium carolinianum L. FL, rar.
EUPHORBIACEAE
Chamaesyce supina (Raf.) Moldenke. SU, occ.
Chamaesyce maculata (L.) Small. SU, occ.
CALLITRICHACEAE
Callitriche heterophylla Pursh. MA, com.
Callitriche terrestris Raf. MA, occ.
ANACARDIACEAE
Toxicodendron radicans (L.) Kuntze. FL, com.
Rhus copallina L. MA, rar.
Rhus glabra L. SU, occ.
AQUIFOLIACEAE
Ilex decidua Walt. SH, com.
CELASTRACEAE
Euonymus atropurpurea Jacq. FL, occ.
ACERACEAE
Acer negundo L. FL, com.
Acer saccharum Marsh. FL, occ.
Acer saccharinum L. FL, com.
Acer rubrum L. TR, com.
BALSAMINACEAE
Impatiens capensis Meerb. FL, com.
VITACEAE
Parthenocissus quinquefolia (L.) Planch. FL, com.
Ampelopsis cordata Michx. FL, com.
Vitis cinerea Engelm. FL, com.
Vitis vulpina L. FL, com.
MALVACEAE
Hibiscus lasiocarpus Cav. MA, com.
Sida spinosa L. SU, rar.
HYPERICACEAE
Triadenum walteri (Gmel.) Gf. Marsh. PO, com.
VIOLACEAE
Viola obliqua Hill. FL, com.
Viola sororia Willd. FL, com.
Viola pubescens Ait. var. *eriocarpa* (Schwein.) Russell. FL, com.
Viola striata Ait. FL, occ.
Viola rafinesquii Greene. SU, occ.
LYTHRACEAE
Decodon verticillatus (L.) Ell. TR, occ.
Lythrum alatum Pursh. MA, rar.
Ammannia auriculata Willd. MA, rar.
ONAGRACEAE
Ludwigia palustris (L.) Ell. var. *americana* (DC.) Fern. & Griseb. MA, rar.
Ludwigia polycarpa Short. & Peter. MA, rar.
Ludwigia peploides (HBK.) Raven ssp. *glabrescens* (Ktze.) Raven. MA, com.
Oenothera biennis L. SU, rar.
APIACEAE
Sanicula gregaria Bickn. FL, occ.
Torilis japonica (Houtt.) DC. SU, occ.
Daucus carota L. SU, occ.
Cryptotaenia canadensis (L.) DC. FL, com.
Sium suave Walt. MA, com.
Erigeron bulbosus (Michx.) Nutt. FL, rar.
Chaerophyllum procumbens (L.) Crantz. FL, occ.
Chaerophyllum tainturieri Hook. SU, com.
Cicuta maculata L. FL, occ.
CORNACEAE
Cornus stolonifera Michx. FL, com.
Cornus drummondii C. A. Mey. SU, occ.
PRIMULACEAE
Anagallis arvensis L. SU, occ.
Lysimachia ciliata L. FL, com.
EBENACEAE
Diospyros virginiana L. var. *pubescens* (Pursh) Dippel. MA, occ.
OLEACEAE
Fraxinus pennsylvanica Marsh. var. *subintegerrima* (Vahl) Fern. FL, com.
Fraxinus americana L. FL, com.
Fraxinus profunda (Bush) Bush. TR, com.
APOCYNACEAE
Amsonia tabernaemontana Walt. FL, occ.
Apocynum cannabinum L. var. *pubescens* (Mitchell) A. DC. SU, occ.
ASCLEPIADACEAE
Asclepias syriaca L. SU, occ.

Asclepias incarnata L. MA, occ.

Cynanchum laeve (Michx.) Pers. MA, occ.

CONVOLVULACEAE

Calystegia sepium (L.) R. Br. ssp.

americana (Sims) Brummitt. SU, occ.

Ipomoea lacunosa L. SU, occ.

GUSCUTACEAE

Cuscuta polygonorum Engelm. TR, com.

Cuscuta gronovii Willd. FL, com.

POLEMONIACEAE

Phlox divaricata L. ssp. *laphamii* (Wood)

Wherry. FL, com.

HYDROPHYLLACEAE

Phacelia purshii Buckley. FL, com.

VERBENACEAE

Phyla lanceolata (Michx.) Greene. SU, occ.

Verbena urticifolia L. SU, occ.

LAMIACEAE

Mentha arvensis L. var. *villosa* (Benth.) S. R.

Stewart. MA, com.

Lycopus americanus Muhl. MA, com.

Lycopus rubellus Moench. MA, com.

Teucrium canadense L. var. *virginicum* (L.)

Eat. FL, occ.

Scutellaria lateriflora L. TR, occ.

Blephilia hirsuta (Pursh) Benth. FL, rar.

Lamium amplexicaule L. SU, occ.

Stachys palustris L. var. *homotricha* Fern.

MA, com.

Stachys tenuifolia Willd. var. *hispida*

(Pursh) Fern. MA, com.

Prunella vulgaris L. var. *elongata* Benth.

SU, occ.

SOLANACEAE

Solanum carolinense L. SU, occ.

Solanum ptycanthum Dunal. FL, occ.

SCROPHULARIACEAE

Gratiola neglecta Torr. MA, com.

Penstemon alluviorum Pennell. SH, rar.

Penstemon digitalis Nutt. FL, com.

Mimulus alatus Ait. SH, occ.

BIGNONIACEAE

Campsis radicans (L.) Seem. SU, com.

ACANTHACEAE

Ruellia strepens L. FL, occ.

PLANTAGINACEAE

Plantago lanceolata L. SU, com.

Plantago rugelii Dcne. SU, com.

RUBIACEAE

Cephalanthus occidentalis L. SH, com.

Galium aparine L. FL, com.

Galium tinctorium L. MA, com.

Diodia teres Walt. MA, rar.

CAPRIFOLIACEAE

Sambucus canadensis L. SU, occ.

Lonicera japonica Thunb. SU, occ.

Viburnum rufidulum Raf. FL, rar.

CAPANULACEAE

Triodanis perfoliata (L.) Nieuwl. SU, occ.

Campanula americana L. FL, com.

Lobelia cardinalis L. FL, occ.

Lobelia siphilitica L. FL, occ.

ASTERACEAE

Senecio glabellus Poir. TR, com.

Solidago juncea Ait. SU, rar.

Solidago gigantea Ait. MA, com.

Solidago canadensis L. SU, occ.

Solidago radula Nutt. SU, rar.

Aster prenanthoides Muhl. FL, rar

Aster pilosus Willd. SU, occ.

Aster vimineus Lam. FL, com.

Aster lateriflorus (L.) Britt. FL, occ.

Aster simplex Willd. FL, com.

Erigeron philadelphicus L. MA, occ.

Erigeron annuus (L.) Pers. SU, com.

Erigeron strigosus Muhl. SU, com.

Conyza canadensis (L.) Cronq. SU, occ.

Verbesina alternifolia (L.) Britt. FL, occ.

Bidens cernua L. TR, occ.

Bidens aristosa (Michx.) Britt. var.

retrorsa (Sherff) Wunderlin. SU, com.

Bidens connata Muhl. MA, com.

Bidens tripartita L. FL, occ.

Bidens frondosa L. SU, occ.

Bidens discoides (Torr. & Gray) Britt. MA, occ.

Helianthus tuberosus L. var. *subcanescens* Gray. FL, occ.

Eclipta prostrata (L.) L. FL, occ.

Achillea millefolium L. SU, occ.

Boltonia asteroides (L.) L'Her. MA, com.

Eupatorium coelestinum L. MA, com.

Eupatorium serotinum Michx. FL, occ.

Eupatorium rugosum Houtt. FL, occ.

Cirsium discolor (Muhl.) SU, occ.

Vernonia missurica Raf. MA, occ.

Vernonia gigantea (Walt.) Treil. FL, occ.

Erechtites hieracifolia (L.) Raf. MA, com.

Ambrosia bidentata Michx. SU, rar.

Ambrosia trifida L. MA, com.

Ambrosia artemisiifolia L. SU, com.

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| <i>Xanthium strumarium</i> L. var. <i>glabratum</i> (DC.) Cronq. SU, occ. | <i>Lactuca canadensis</i> L. SU, com. |
| <i>Pyrrhappus carolinianus</i> (Walt.) DC. SU, rar. | <i>Lactuca floridana</i> (L.) C. A. Mey. FL, occ. |

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Fig. 1. Map of the Lovets Pond area showing study site boundary and natural communities in 1986.

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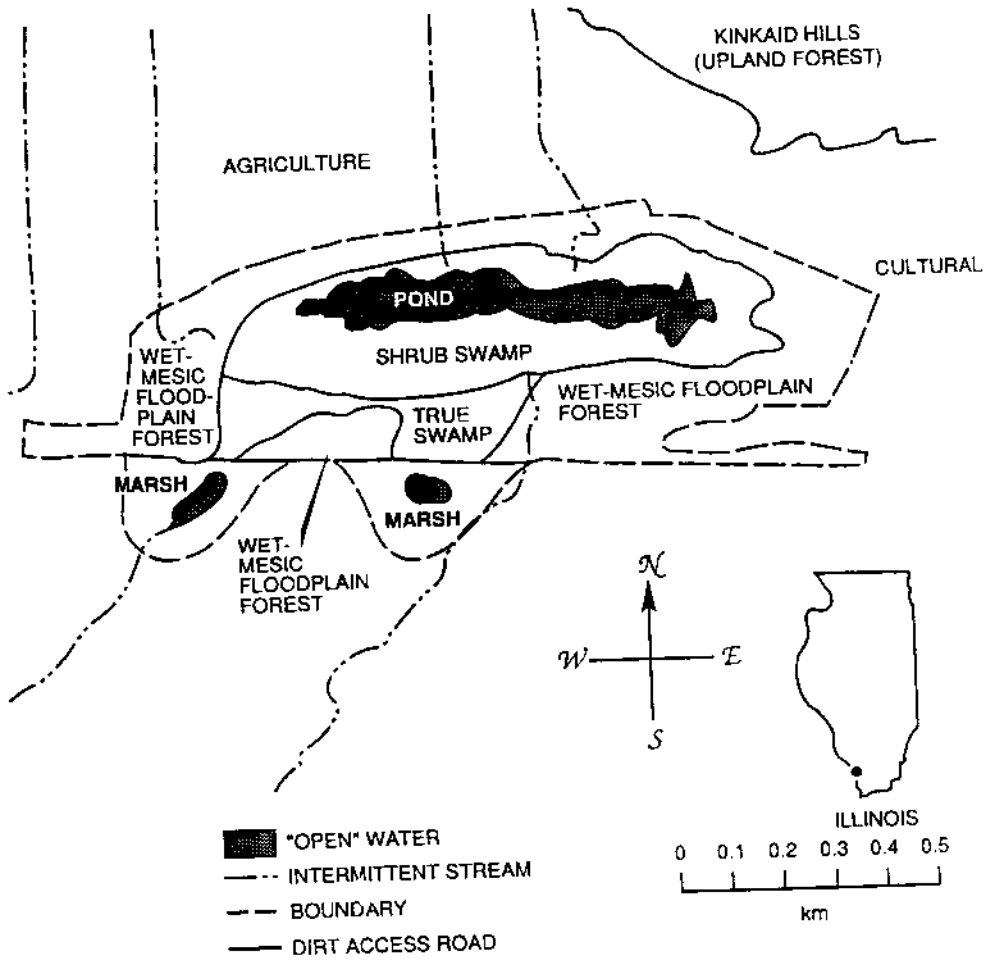


Fig. 2. Map showing the aquatic features of the Lovets Pond region just prior to settlement (circa 1807) based on field notes taken for the Public Land Survey, 1804-1850.

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