

DISTRIBUTION OF THE COMMON VASCULAR HYDROPHYTES IN ILLINOIS

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ABSTRACT.-- The investigation of numerous aquatic habitats has extended the ranges of many hydrophytes in Illinois. Notes concerning the geographic distribution and county distribution maps of these species are included.

Aquatic plants have not been commonly collected in Illinois until fairly recently. Therefore, for many taxa, the counties for which the species have been reported by Jones and Fuller (1955), Winterringer and Evers (1960) and more recently by Mohlenbrock (1967a,1970) represent an incomplete picture of their distribution in the state. Because of this, the authors investigated aquatic habitats for the past four years in an attempt to update and to extend the distributional ranges of vascular hydrophytes in Illinois.

Besides the authors' collections, numerous specimens from most of the herbaria in the state were examined. The most extensive collection is at the Illinois State Museum (ISM). Most of these specimens had been collected during the summers of 1964 and 1965 by Conservation Biologists of the Division of Fisheries, Department of Conservation. A total of 1175 collections had been made by these Conservation Biologists who were involved in a project to collect and identify the submerged and floating aquatic plants of the state of Illinois. The most extensive collections were made by K. Russell, A. W. Fritz, R. Fisher, and J. Allen. A description of the project and its accomplishments are discussed by Lopinot (1965) and Winterringer (1966).

The present literature concerning the distribution of aquatic vascular plants in Illinois is fairly extensive. Recently, Winterringer and Lopinot (1966) completed a flora of the vascular hydrophytes of Illinois but gave only the general distribution of each species in the state. Also, a few families of hydrophytes have been studied in detail. Mohlenbrock and Richardson (1967) revised the Alismales of Illinois, while the Lemnaceae were studied by Weik and Mohlenbrock (1968) and the Haloragaceae and Hippuridaceae were revised by Meyer and Mohlenbrock (1966).

Most of the remaining literature on the aquatic vascular plants are regional studies or reports concerned with new county records. The

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majority of these reports are concerned with the plants of southern Illinois. A detailed discussion of the varied aquatic habitats in southern Illinois is given by Mohlenbrock (1959), and Mohlenbrock, Dillard, and Abney (1961), while Fore, Stookey and Parsons (1965) recorded the distribution of aquatic and shoreline species. Other reports from this area are mostly incidental reports in checklists and notes concerned with county records and range extensions. These reports include a checklist of the Pine Hills Field Station by Ashby and Kelting (1963) and Mohlenbrock and Voight (1965); a study of the Devils Kitchen Area by Mohlenbrock (1962) and Stookey, Fore, and Mohlenbrock (1964); a discussion of the plant communities at Horseshoe Lake by Koelling (1968); a checklist of the plants of Lake Murphysboro State Park by Mohlenbrock (1967b) and a listing of new county records for Washington County by Windler (1966). Range extensions of aquatic species into southern Illinois are listed by Schwegman and Mohlenbrock (1966, 1968). A few aquatic species are also listed by Hopkins (1969) for some fresh-water springs in southern Illinois while Anderson and White (1970) found a few aquatic species in a cypress swamp in Johnson County.

For the remainder of the state, the reports are very meager with only a few species listed in county checklists. For eastern Illinois there are reports by Ebinger (1967) and by Parker, Rayhill, and Ebinger (1969) for Coles County while Wunderlin (1966) lists a few aquatic species from the Mississippi Palisades State Park in western Illinois. Recently, Dolbeare (1974) included a few aquatics in a study of plants collected in western Illinois and Dobbs (1963) included a few in his flora of Henry County. Also, Myers (1972) published a catalog of the Illinois flora and included a few aquatic records for McDonough County. In northeastern Illinois Swink (1969) recorded a few new aquatic records while Dobeare (1967) listed a number of aquatics from Grays Lake in Lake County.

In addition to the above material, the aquatics of strip mines in Illinois have been studied by Bell (1956) and Lewis and Peters (1955). Other contributions include the report of two new species of naiads to the flora of Illinois (Fore and Mohlenbrock, 1966), and the addition of Naias marina L. and Ruppia maritima L. to the Illinois flora by Winterringer (1966).

The annotated checklist which follows contains new county records for many vascular hydrophytes of Illinois. This list is restricted mainly to free-floating, submersed, and floating-leaved hydrophytes. Only a few emergent species are included, and no attempt was made to list the numerous shoreline species. Each species listed is followed by a brief note concerning its habit and distribution in Illinois. Included for most of the species is a county map showing their distribution in Illinois. On these maps a circle represents a county in which the species has been reported previously while a square indicates a new county record. For a few of the rare species, and some for which only a few new records are being reported, no map is included. For these species the county and collecting data of the specimens are listed. The herbaria included in this study are the

Illinois State Museum (ISM), Eastern Illinois University (EIU), the University of Illinois (ILL), the Illinois State Natural History Survey (ILLS), and Western Illinois University (WIU). The nomenclature conforms to Jones (1963).

Marsileaceae

Marsilea quadrifolia L. An emergent, aquatic fern that is rarely found in older ponds and lakes in the southern two-thirds of the state. It is native to Europe and when introduced rapidly becomes established and commonly persists (Ebinger, 1967). It is now well established in ponds at Kickapoo State Park in Vermilion County where it was introduced by the State Natural History Survey in 1939 (Jones and Fuller, 1955).

County records.-- MADISON: Onized Club waters, 2 mi NW of Godfrey, Lockart (14 July 1965) (ISM).

Salviniaceae

Azolla mexicana Presl. This floating fern is relatively common in the western part of the state. No specimens are known from east-central Illinois.

County records.-- JOHNSON: Watson Pond, White 1991 (SIU). MASSAC: Mermet Lake, Ebinger 14843 (EIU).

Acanthaceae

Dianthera americana L. A common emergent that grows in shallow water and on muddy shores of rivers and lakes. It is probably statewide in distribution (Map 1).

Cabombaceae

Brasenia schreberi Gmel. This floating-leaved species is rarely encountered except in scattered localities that are mostly in southern and northeastern Illinois. Very few collections are known from the central part of the state (Map 2).

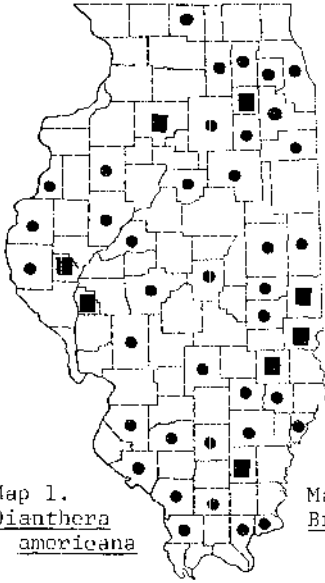
Cabomba caroliniana A. Gray An extremely rare submersed aquatic that is found in ponds and slow-moving streams. Except for its occurrence in Vermilion County it is known from only extreme southern Illinois.

County records.-- JACKSON: Turkey Bayou, NE of Howardton, Evers 104901 (ILLS). SALINE: Marten's Pond, 3 mi NW of Galatia, Allen (17 June 1964) (ISM). VERMILION: Boy Scout Pond, 1 mi SE of Oakwood, Fritz (9 Sept. 1965) (ISM).

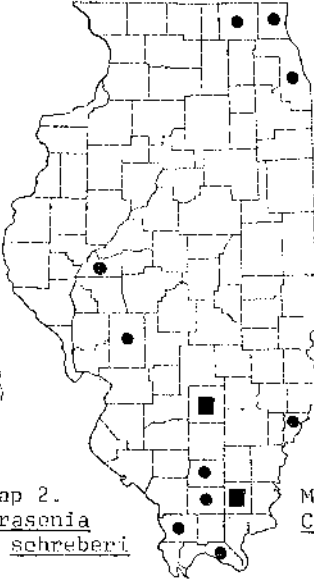
Callitrichaceae

Callitriche heterophylla Pursh This aquatic with submersed and floating leaves is sometimes encountered in ponds. More commonly, we have found it in ephemeral pools and ditches in early spring. It is found scattered throughout the state (Map 3).

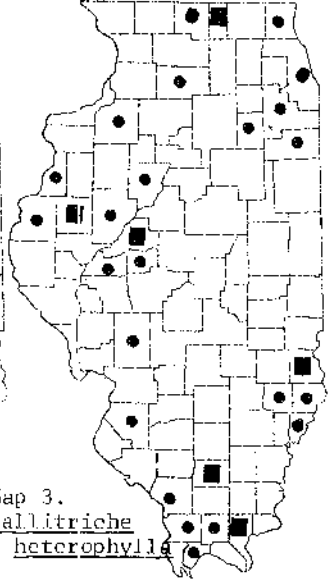
Callitriche palustris L. This taxon is found in scattered localities throughout the state, being more rarely encountered than the preceding species (Map 4). Its ellipsoid, sharply keeled fruits separate it from C. heterophylla which has nearly round fruits that lack keels.



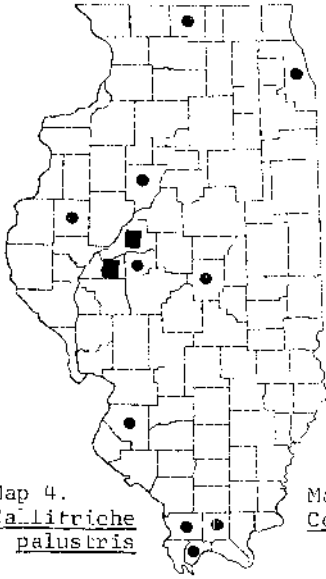
Map 1.
Dianthera
americana



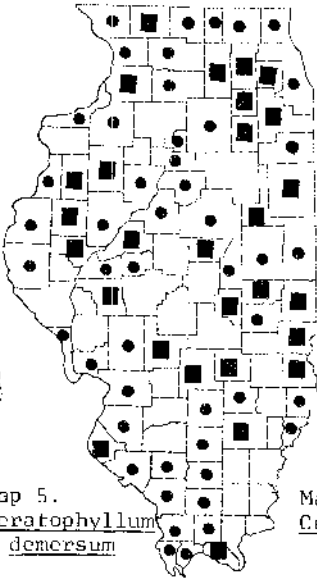
Map 2.
Brasenia
schreberi



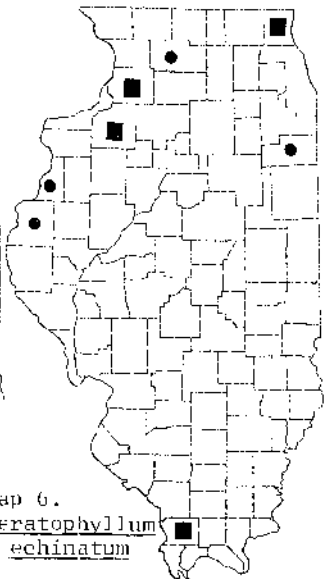
Map 3.
Callitriche
heterophylla



Map 4.
Callitriche
palustris



Map 5.
Ceratophyllum
demersum



Map 6.
Ceratophyllum
echinatum

Ceratophyllaceae

Ceratophyllum demersum L. A fairly common submersed aquatic that is statewide in distribution (Map 5).

Ceratophyllum echinatum A. Gray A relatively rare submersed aquatic that is locally abundant, mostly in the northern part of the state (Map 5). We have found this taxon growing together with C. demersum. When this occurs it is not very abundant and easily overlooked. Fruiting material is necessary for accurate separation of these taxa. The achenes of C. echinatum commonly have 10 or more spines while the achenes of C. demersum have only 3 spines.

Haloragaceae

Myriophyllum pinnatum (Walt.) BSP. This aquatic, which occurs most commonly on mud flats, is found in scattered localities in western and southern Illinois. Vermilion and Richland Counties are the only reports of this species in eastern Illinois.

County records.-- JACKSON: Ditch NE of Gorham, Evers 65707 (ILLS). RICHLAND: Pond, 1 mi E of Calhoun, Ebinger 10775 (EIO).

Myriophyllum spicatum L. A submersed aquatic that is occasionally encountered in older lakes and farm ponds. It is mostly restricted to the northern half of the state (Map 7). This taxon is referred to M. exalbescens Fern. by Winterringer and Lopinot (1966) and Meyer and Mohlenbrock (1966).

Lentibulariaceae

Utricularia gibba L. This submersed aquatic is sometimes found on muddy shores, and usually in semi-stagnant habitats. It is probably restricted to the south, southwest, and northeast parts of the state. No specimens are known from east-central Illinois (Map 8).

Utricularia minor L. An extremely rare, submersed aquatic that has been reported from only two counties in the northeastern corner of Illinois.

County records.-- CLAY: Farm pond, 7 mi NW of Orchardville, Fisher (30 Aug. 1965) (ISM). SALINE: Marten's Pond, 3 mi NW of Galatia, Allen (17 June 1964) (ISM).

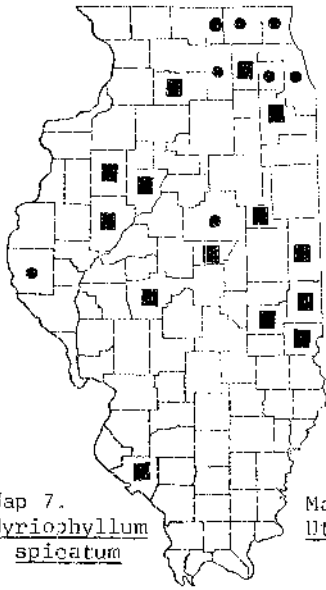
Utricularia vulgaris L. This bladderwort has a sporadic occurrence in the state, being most common in the northern and western parts of Illinois. No specimens are known from east-central Illinois (Map 9).

Lythraceae

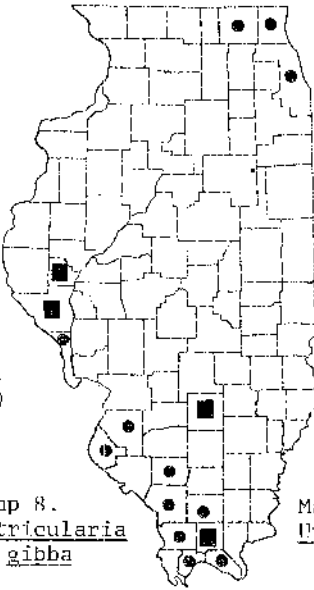
Peplis diandra Nutt. This usually submersed aquatic is rarely encountered. It is found in scattered localities that are mostly in southern and western Illinois. No collections are known from east-central Illinois (Map 10).

Nelumbonaceae

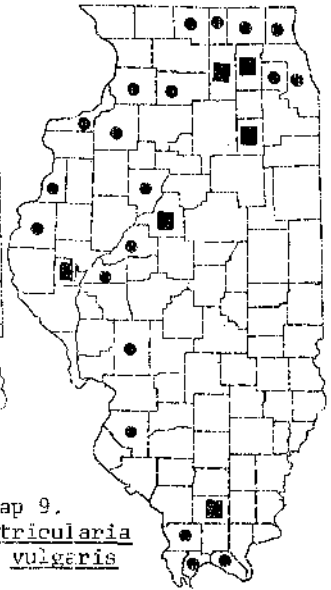
Nelumbo lutea (Willd.) Pers. This extremely beautiful emergent is found in shallow waters of usually older aquatic habitats. It is more common in western and southern Illinois, being reported as abundant along the Mississippi and Illinois Rivers by Winterringer and Lopinot (1966). It is undoubtedly statewide in distribution, probably the result of cultivation (Map 11).



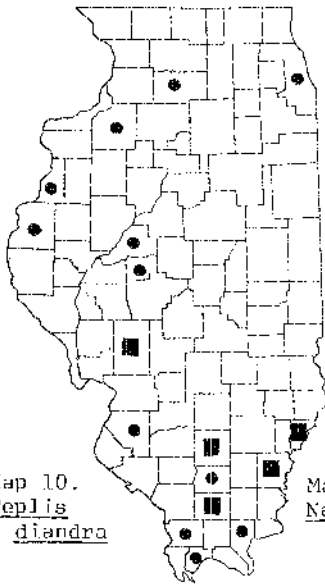
Map 7.
Myriophyllum
spicatum



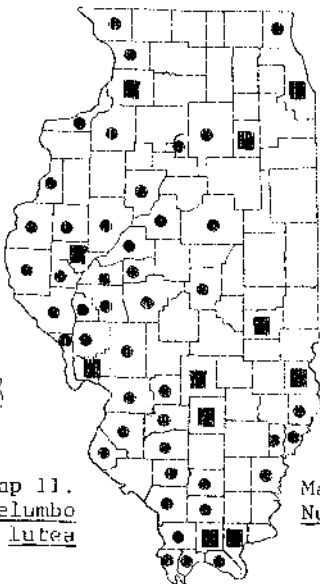
Map 8.
Utricularia
gibba



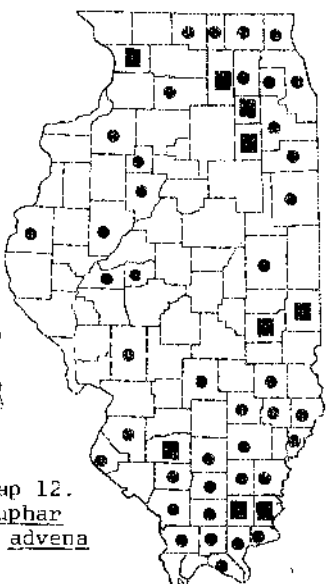
Map 9.
Utricularia
vulgaris



Map 10.
Peplis
diandra



Map 11.
Nelumbo
lutea



Map 12.
Nuphar
advena

Nymphaeaceae

Nuphar advena Ait. This emergent species is statewide in distribution, probably occurring in every county. It is usually restricted to sheltered lake shores and to slow-moving streams (Map 12).

Nuphar variegatum Engelm. This rare emergent is restricted to the extreme northeast corner of the state where it is now known from three counties.

County records.-- MCHENRY: McCullom Lake, 1 mi E of Greenwood, Dolbeare 1198 (EIU).

Onagraceae

Jussiaea repens L. A pantropical, emergent aquatic that is found on muddy banks and shorelines in the southern half of the state (Map 13). It is rare in the rest of Illinois, being extremely uncommon north of the terminal moraine of the Wisconsin glacier.

Ludwigia palustris (L.) Ell. Similar to the preceding species in habitat, but being a smaller plant it is not as obvious. It is very common on moist, muddy shores and is statewide in distribution, probably occurring in every county (Map 14).

Polygonaceae

Polygonum coccineum Muhl. A common emergent that is usually found in shallow water or on wet ground. It is statewide in distribution and probably occurs in every county (Map 15).

Primulaceae

Hottonia inflata Ell. A very rare and unusual aquatic that is sometimes encountered in swamps in extreme southern Illinois.

County records: JOHNSON: Cypress swamp SW of Forman, Evers 98772 (ILLS). POPE: Round Lake, New Liberty, Schwegman (9 May 1970) (ILLS).

Ranunculaceae

Ranunculus flabellaris Raf. A submersed aquatic that is sometimes encountered in ponds and slow-moving streams throughout most of the state. It is more common in northern Illinois (Map 16).

Ranunculus longirostris Godr. This aquatic buttercup is commonly submersed, but sometimes is found on muddy shores. Though not commonly encountered, it is nearly statewide in distribution. It is common in the northern half of the state (Map 17).

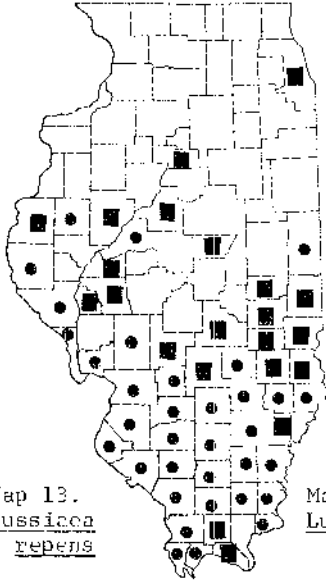
Ranunculus trichophyllus Chaix Similar to the preceding species but with softer, petioled leaves. It is not very common, and is mostly restricted to the northern half of the state (Map 18).

Scrophulariaceae

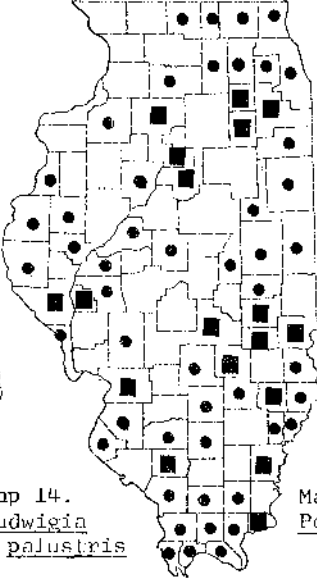
Bacopa rotundifolia (Michx.) Wettst. This species is mostly restricted to muddy shores and very shallow water. It is occasionally found in the southern and western parts of the state and has rarely been reported from north of the terminal moraine of the Wisconsin glacier (Map 19).

Veronica catenata Pennell This emergent species is occasionally encountered in the northern half of the state. The only southern collection is from St. Clair County.

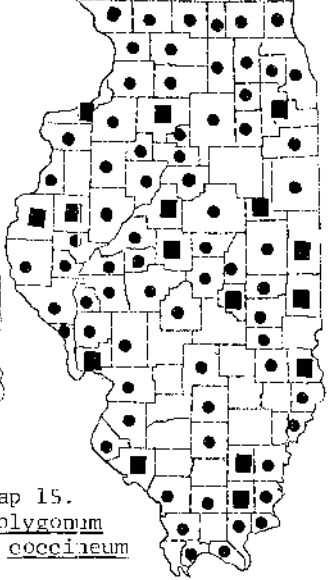
County records.-- VERMILION: Strip mine pond at Kickapoo State Park, Ebinger 11676 (EIU).



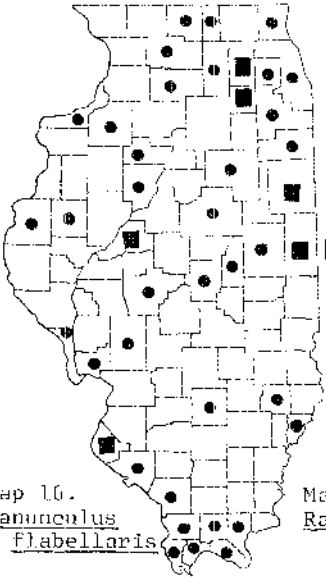
Map 13.
Jussieca
repens



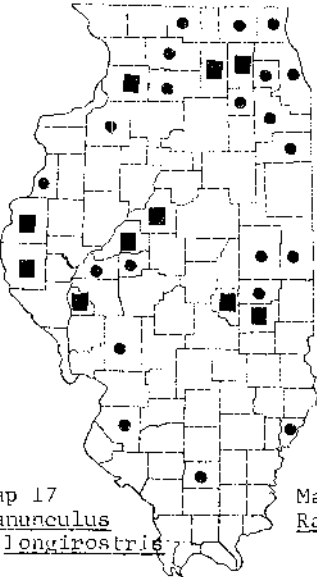
Map 14.
Ludwigia
palustris



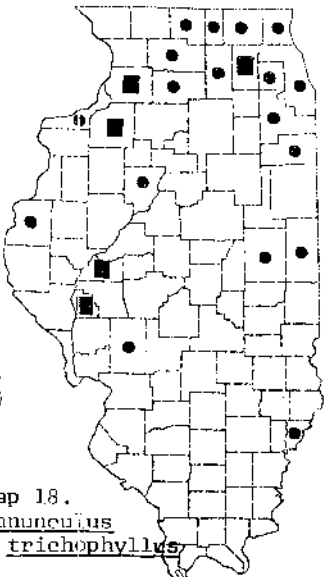
Map 15.
Polygonum
coccineum



Map 16.
Ranunculus
flabellaris



Map 17.
Ranunculus
longirostris



Map 18.
Ranunculus
trichophyllus

Hydrocharitaceae

Elodea canadensis Michx. This submersed aquatic is occasionally encountered in older lakes and farm ponds. It occurs very sporadically in southern Illinois, becoming more common farther north (Map 20). This species is similar to E. occidentalis and is sometimes confused with it. Usually the leaves of E. canadensis are wider (1.5-5 mm wide) than those of E. occidentalis (0.5-1.5 mm wide), but for accurate separation flowering material is necessary.

Elodea densa Planch. This submersed aquatic is adventive in Illinois, probably being introduced as a result of aquarium disposals (Mohlenbrock, 1970). It is now known from 4 counties, all in southern Illinois.

County records.-- EDWARDS: Jarvis Oil Co. Lake #2, SE edge of Albion, Fisher (10 July 1964) (ISM). JEFFERSON: Lakeview Estates Lake, 1 mi. W of Mt Vernon, Fisher (17 June 1965) (ISM).

Elodea occidentalis (Pursh) St. John This species is more common than E. canadensis. It is fairly rare in southern Illinois, but becomes more common farther north (Map 21). This taxon is referred to E. nuttallii (Planch.) St. John by Winterringer and Lopinot (1966) and Mohlenbrock (1970).

Vallisneria americana Michx. An occasionally encountered submersed aquatic that is restricted to the northern half of the state.
County records.-- JO DAVIESS: Perchang's Lake, 1.5 NW of Blanding, Rock (24 Aug. 1965) (ISM). ROCK ISLAND: Gager (10 Aug. 1966) (WIU).

Lemnaceae

Lemna minor L. This extremely common floating species is statewide in distribution. It probably occurs in every county (Map 22).

Spirodela oligorhiza (Kurtz) Hegelm. This extremely rare floating species has been reported from only Union and Alexander Counties. The smaller fronds with usually 3 nerves and 1-5 rootlets make it easy to separate from the next species.

County records.-- LAWRENCE: Pond, 3 mi NE of Lawrenceville.
Ebinger 10733 (EIU).

Spirodela polyrhiza (L.) Schleid. This fairly common floating species is statewide in distribution. It probably occurs in every county (Map 23).

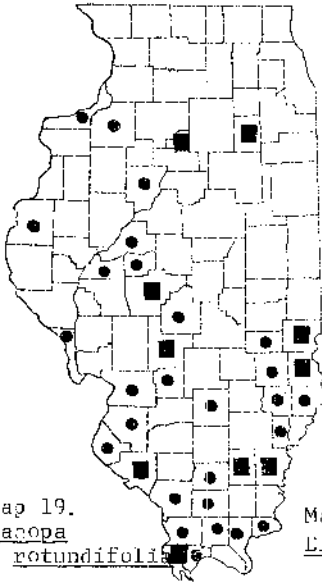
Wolffia columbiana Karst. This extremely small floating aquatic is statewide in distribution. It probably occurs in every county, but may be overlooked because of its size (Map 24).

Wolffia punctata Griseb. This tiny floating species has been found in scattered localities throughout the state. It is probably most common in west-central Illinois.

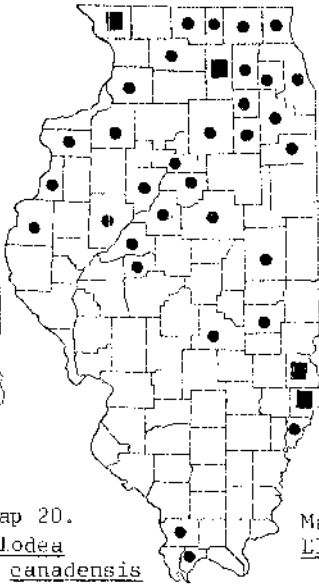
County records.-- RICHLAND: Small lake, 1 mi N of Olney, Ebinger 11913 (EIU). WOODFORD: 7 mi S of Lacon, Hartman 1420 (WIU).

Naiadaceae

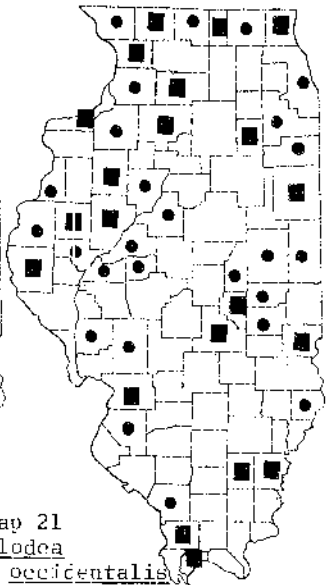
Najas flexilis (Willd.) R. & S. This submersed aquatic is sometimes found in older farm ponds and lakes. It is widely scattered throughout the state, but is more common in northern and western Illinois (Map 25). Dobbs (1963) mentions that this species probably occurs in Henry County, but the specimen was in such poor condition that he could not verify it.



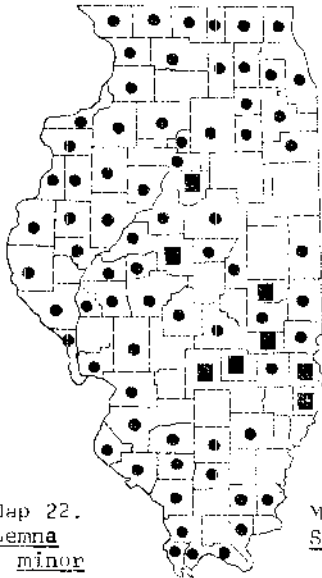
Map 19.
Sagopa
rotundifolia



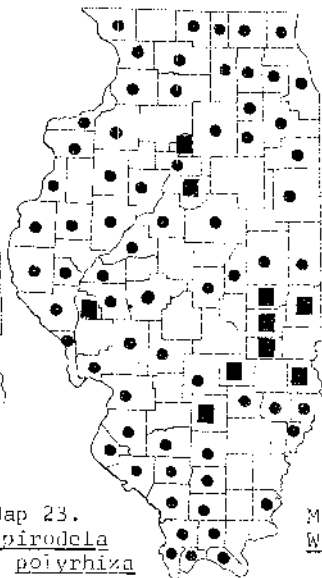
Map 20.
Elodea
canadensis



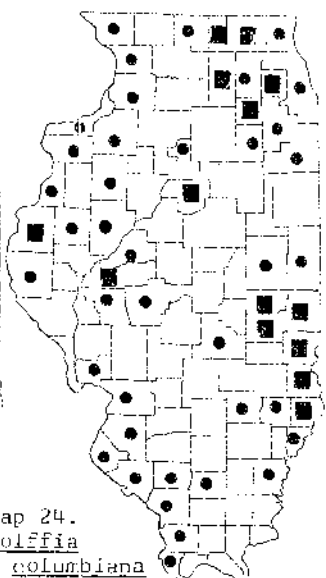
Map 21
Elodea
occidentalis



Map 22.
Lemna
minor



Map 23.
Spirodela
polyrhiza



Map 24.
Wolffia
columbiana

Naias gracillima (A. Br.) Magnus This delicate and slender naiad is rarely encountered. Except for its occurrence in Ford County it appears to be restricted to the southern one-third of Illinois (Map 26).

Naias minor All. This fairly common submersed species which has become naturalized from Europe was not listed by Jones (1963), being first reported for Illinois in 1966 (Fore and Mohlenbrock, 1966; Winteringer, 1966). It is now commonly encountered in older lakes and farm ponds in the southern two-thirds of Illinois (Map 27).

Naias guadalupensis (Spreng.) Magnus This submersed species was reported as rare by Jones (1963) while Mohlenbrock (1970) reported it as "occasional in the southern counties; rare or absent elsewhere." We have found this species to be one of the most common aquatics in the southern two-thirds of the state (Map 28). Naias guadalupensis is similar to N. flexilis and is commonly confused with it. Careful examination of the achenes is necessary to separate these taxa. In N. flexilis the areolae are very small and in 30 to 50 rows on the achene while in N. guadalupensis the areolae are much larger and in only 16 to 24 rows.

Pontederiaceae

Heteranthera dubia (Jacq.) MacM. A submersed aquatic that is occasionally encountered in the northern two-thirds of the state (Map 29). Mohlenbrock (1970) places this taxon in the genus Zosterella.

Heteranthera limosa (Sw.) Willd. This extremely rare aquatic was recently reported from Hardin County (Fore, Stookey, and Parsons, 1965). The present record represents the farthest north that this tropical American species has been reported in Illinois.

County records.-- ADAMS: Fairground pond, Mendon, Henry 1588 (WIU). MASON: Sand pond, west of Saidora, Rexroat 5198 (ISM). UNION: Pond, Union Co. Game Refuge, Ebinger 13141 (EIU).

Potamogetonaceae

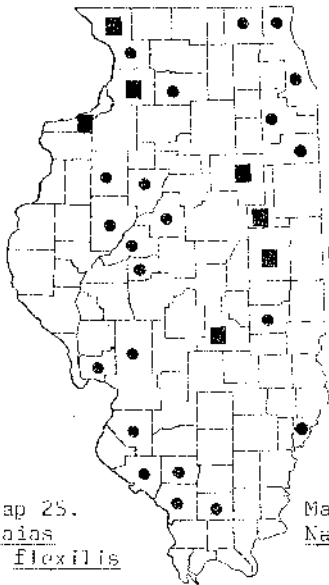
Potamogeton americanus C. & S. This pondweed is commonly encountered in older lakes and ponds throughout Illinois. It probably occurs in every county (Map 30). This taxon is referred to P. nodosus Poir. by Winteringer and Lopinot (1966) and Mohlenbrock (1970).

Potamogeton crispus L. This naturalized, European species has become well established in Illinois. According to Mohlenbrock (1970) it is restricted to the northern half of the state. It now appears to be statewide in distribution, but is more common in northern Illinois (Map 31). We have rarely found fruiting material of this taxon.

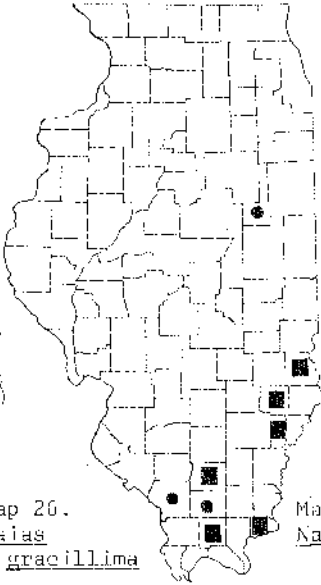
Potamogeton diversifolius Raf. This pondweed is relatively common in southern and western Illinois. Except for its occurrence in the extreme northern counties of Illinois it is not commonly found north of the terminal moraine of the Wisconsin glacier (Map 32).

Potamogeton foliosus Raf. This submersed pondweed is a pioneer aquatic species that is extremely common throughout the state. It undoubtedly occurs in every county and is probably the most frequently encountered submersed aquatic in Illinois (Map 33).

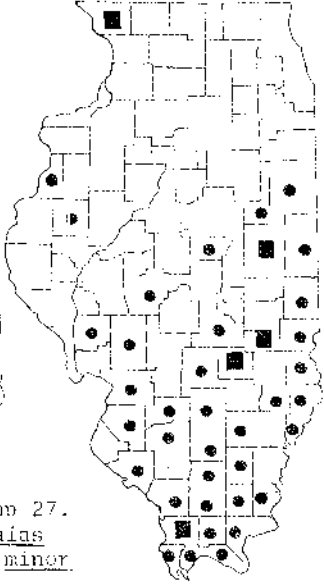
Potamogeton friesii Rupr. A very rare submersed pondweed that has been reported from only the northeast corner of Illinois. The present



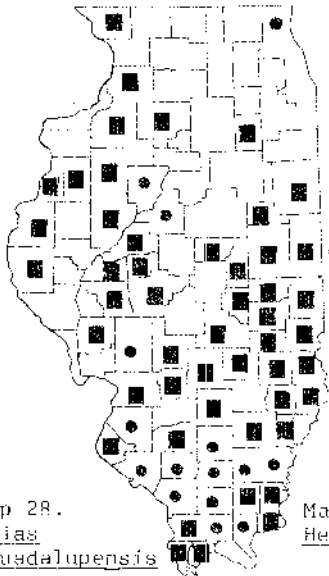
Map 25.
Naias
flexilis



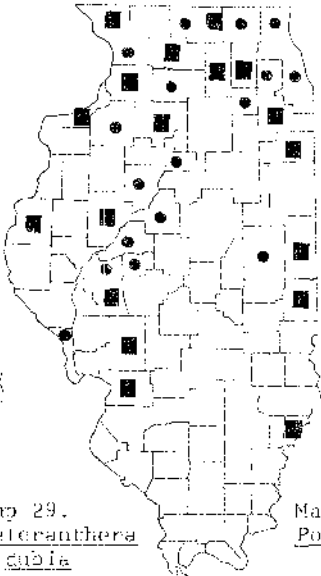
Map 26.
Naias
gracillima



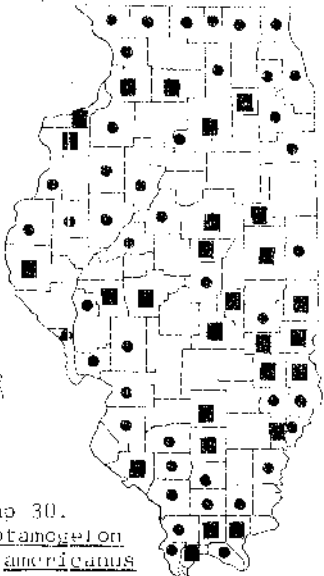
Map 27.
Naias
minor



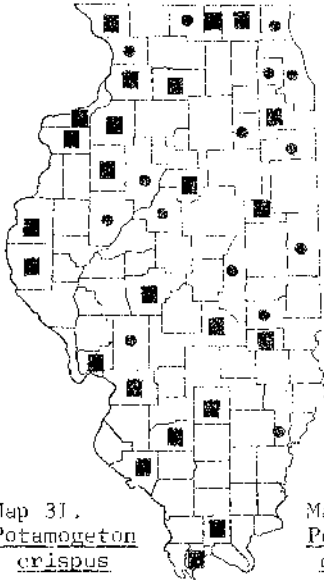
Map 28.
Naias
guadalupensis



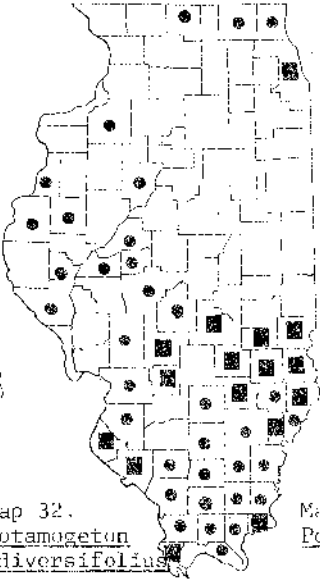
Map 29.
Heteranthera
cubia



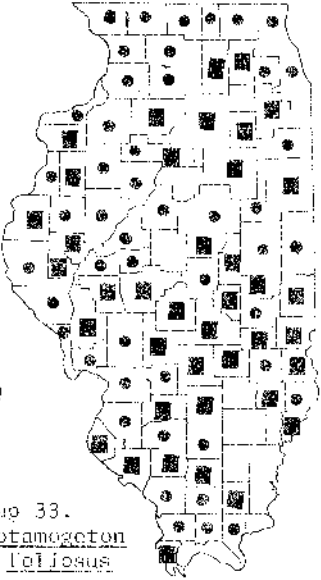
Map 30.
Potamogeton
americanus



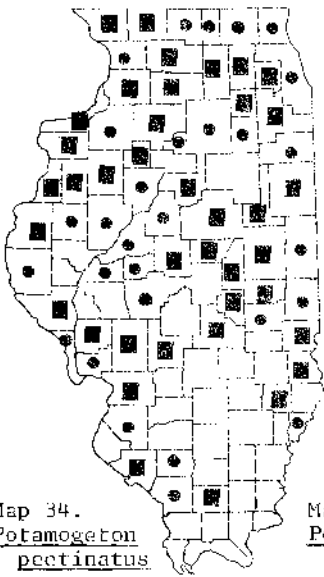
Map 31.
Potamogeton
crispus



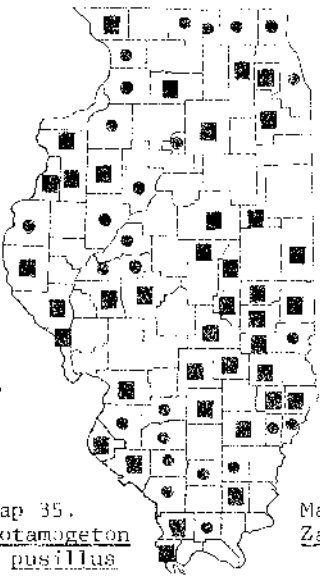
Map 32.
Potamogeton
diversifolius



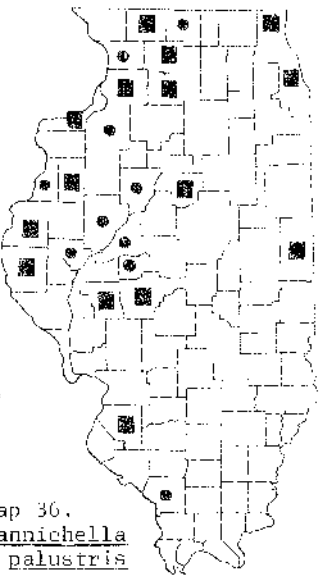
Map 33.
Potamogeton
foliosus



Map 34.
Potamogeton
pectinatus



Map 35.
Potamogeton
pusillus



Map 36.
Zannichella
palustris

report from Shelby County represents a disjunct and probably temporary range extension as the species was not found when the site was visited the next year.

County records:-- SHELBY: Pond, 5 mi E of Strasburg, Ebinger 10704 (EIU). MCHENRY: Lake at Bear Valley Hunting Club, Dolbeare 1381 (EIU).

Potamogeton illinoensis Morong. This pondweed is occasionally encountered in the northern half of Illinois. It is extremely rare in southern Illinois, being recorded from only three counties.

County records.-- JO DAVIES: Slough, SE of Menominee Station, Evers & Crane 105976 (ILS). LAWRENCE: Lake at Lawrenceville Sportsman's Club, Lepinet (25 Aug. 1965) (ISM). ST. CLAIR: Lake at Grand Marais St. Park, Neill 9500 (ILS).

Potamogeton pectinatus L. This submersed pondweed is statewide in distribution. It is fairly common in the northern two-thirds of the state, becoming rare in southern Illinois (Map 34).

Potamogeton pusillus L. This submersed pondweed is fairly commonly encountered throughout the state and probably occurs in every county (Map 35). It is similar to P. foliosus in habit, and fruiting material is necessary for consistent separation.

Potamogeton strictifolius Benn. An extremely rare submersed pondweed that is now known from a second county in the northeast corner of Illinois. County records.-- LAKE: Grays Lake. Dolbeare 1042 (ISM).

Zamichellia palustris L. A submersed aquatic that is found in scattered localities throughout the state. Most of the specimens seen are from western and northwestern Illinois (Map 36).

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