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The Bryophytes of Knox County, Illinois

Kurtis J. Cecil

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The Bryophytes of Knox County, Illinois

(TITLE)

BY

Kurtis J. Cecil

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
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IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
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THE BRYOPHYTES OF KNOX COUNTY, ILLINOIS

By

Kurtis J. Cecil

B. S. in Environmental Biology, Eastern Illinois University

Abstract of a Thesis

Submitted in partial fulfillment of the requirements of the Degree of Master of Science in Botany at the Graduate School of Eastern Illinois University

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ABSTRACT

Field and herbarium studies conducted over an eleven month period found 84 taxa of bryophytes in Knox County. Included in this list are one hornwort (Class Anthocerotae), 15 liverworts (Class Hepaticae), and 68 mosses (Class Musci). Eighty-two species are new county records. Six previously unreported taxa produced during herbarium studies and one previous report were not relocated in the field. An annotated list provides collection data, location of voucher, and frequency of those species located in Knox County. A presettlement vegetation map is included to illustrate the location of collection sites.

ACKNOWLEDGEMENTS

I would like to express my deepest appreciation to Dr. Charles B. Arzeni who not only made this study possible and guided me throughout but also inspired me to study a world of tiny plants so often overlooked. I thank Bill McKnight, Curator of the Biological Sciences at the Indiana State Museum, for invaluable advice and assistance. The Knox College Biology Department was generous in allowing the use of their field station and herbarium. In addition I would also like to thank Dr. John Ebinger and Dr. Andrew Methven for their advice, critical review of the manuscript, and most of all for trying to pass on some of their knowledge to me.

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INTRODUCTION

Knox County is located in northwestern Illinois between the Mississippi and Illinois Rivers (Figure 1). The southern two-thirds of the county lie in the Galesburg Section of the Western Forest-Prairie Division (Schwegman, *et al.*, 1973). The Spoon River flows through this part of the county providing the most diverse terrain where erosion has caused abrupt changes in elevation from the uplands to floodplains along the river and its tributaries. The northern one-third of the county is in the Western Section of the Grand Prairie Division and features a level to gently rolling terrain.

Knox County covers an area of 1,888 km^2 (729 mi^2) (Windhorn, 1986) which lies entirely within the Galesburg Plain in the Till Plains Section of the Central Lowland Province (Willman and Frye, 1970). The most recent glacial advance to reach the area was the Illinoian, which covered the entire county. The highest point is 267 m (875 ft) at Pilot Knob in the northwestern part of the county, the lowest point is 163 m (534 ft) where the Spoon River leaves the county at London Mills for a total relief of 104 m (341 ft). An elevated ridge in the northwestern part of the county affords drainage toward the Mississippi River. Southeast of the ridge, the Spoon River drains an area of approximately 1,524 km^2 (588 mi^2) which flows toward the Illinois River. Strip pits from surface mining and three large man made lakes provide about 6,175 ha (2,500 acres) of impounded water.

The climate of Knox County is typical of the midwest, exhibiting extremes of heat and cold with an average yearly temperature of 10.1°C. Annual precipitation averages 92.3 centimeters (Windhorn, 1986). Climatic conditions, however, were atypical during this study. After two years of extreme drought 1990 yielded unusually high precipitation.

The soils in Knox County, which are primarily of two main associations, are high in organic matter and well suited for agricultural purposes (Windhorn, 1986). Tama-Ipava association soils formed in loess on uplands, formerly covered by tall-grass prairie, comprise the largest area. The Lawson-Sawmill-Huntsville association, formed in silty alluvium, which includes the level soils of the floodplains of the Spoon River and its major tributaries is frequently flooded.

Knox County has changed dramatically since presettlement times. When initially settled, approximately 57% of the county was prairie, 33% forest and 10% savannah (Fehrenbacher, *et al*, 1977). The ensuing clearing and drainage of land and channelizing of waterways has created a landscape which would be unrecognizable by the Potawatomi Indians that once inhabited the Spoon River region near present day Maquon (Charles C. Chapman & Co., 1878).

The scattered patches of forest in Knox County typically consist of dominant oak-hickory, dry-mesic forest on the uplands, with occasional mesic forest in ravines and north facing slopes where sugar maple is common. Cottonwood,

sycamore, silver maple and willow are abundant in the wet-mesic floodplain forests encountered in the bottomlands of the Spoon River and its tributaries. According to the Illinois Natural Areas Inventory (White, 1978) there are approximately 14.3 ha (35 acres) of Grade A & B natural areas remaining in five locations in the county. These lands are comprised of 13.8 ha (34 acres) Forest, 0.2 ha (0.5 acres) Prairie, and 0.3 ha (0.7 acres) Savanna. Grade A Natural Areas are described as relatively stable or undisturbed communities. Grade B Natural Areas are described as late successional or lightly disturbed communities. Galesburg, the county seat, is a major railroad hub and prairie remnants are still visible along the railroad easements and in some cemeteries. Knox College maintains a 308 ha (760 acres) biological station in the eastern part of the county which includes a diverse tall-grass prairie of approximately 16 ha (40 acres). This was restored on surface mined land (*pers. comm.*, Dr. Peter Schramm, Biology Dept., Knox College).

Land use practices are the principal reason for the altered landscape of Knox County. Much of the previously forested area has been cleared for farming. In 1978 only about 19% (12,063 ha) of the presettlement total of woodland remained in the county. Only the topography or remoteness of these areas has spared them (Windhorn, 1986). In 1978 approximately 167,629 ha (414,044 acres) were being farmed, mostly for grain crops (U.S. Dept. of Commerce, Bureau of Census, 1980). That area represents approximately 89% of the

county. About 117,187 ha (289,453 acres) of this farmland met the United States Department of Agriculture's criteria for prime farmland. Surface mining, which began around 1920, has also altered the natural landscape, disturbing approximately 8,609 ha (21,264 acres) (Windhorn, 1986). Presently mining activity has ceased except for a small area in the southeast part of the county.

LITERATURE REVIEW

McKnight (1987) listed five publications that included bryophytes from Knox County. No additional publications involving bryophytes were found in the literature. There are only two reported taxa of bryophytes from Knox County. Hague (1937) reported *Fimbriaria tenella* Nees (≡ *Asterella tenella* (L.) P. Beauv.) and noted the voucher location to be the E. J. Hill Herbarium, University of Illinois (ILL). In all probability, this report was based on a collection made by Virginius Chase in 1908 as it is the only specimen of *Fimbriaria tenella* from Knox County located during this study. Spessard's (1972) literature review noted that Hague had reported hepatics from several counties in Illinois, including Knox County. Spessard (1972) also included Knox County in the distribution of *Asterella tenella*. McCleary and Redfearn (1979) stated that Knox County was one of twelve counties in Illinois which had no reports of mosses, and Burnette (1981) reported that Knox County was overlooked bryologically. Chimney (1984) made the first

report of *Ricciocarpos natans* (L.) Corda from a strip mine impoundment in Knox County. No mention of a voucher was made, but identification was confirmed by Dr. R.E. Stotler, Department of Botany, Southern Illinois University. Water chemistry data included in this report (Chimney, 1984) noted that conductivity, total dissolved solids (TDS), and sulfate (SO_4) were at the highest levels reported for any locality supporting this organism.

The lack of previous attention to Knox County's bryophytes is in contrast with the neighboring counties of Peoria, to the west, and Fulton, to the south. According to McKnight (1987), Fulton County has been cited in 25 publications of Illinois bryophytes including landmark works by Brendel (1887), Hague (1930,1937), and Wolf and Hall (1878). Peoria County appears in the bryological literature in 14 publications and includes works by Brendel (1859, 1882a, 1882b, 1887), Hague (1930, 1937), Hague and Drexler (1938), and Wolf and Hall (1878).

MATERIALS AND METHODS

A field study of the bryoflora of Knox County was conducted from April, 1990 through March, 1991. This area was chosen for study because there had been no detailed bryofloristic survey and also because of the author's familiarity with the county. Voucher specimens were collected in the field and placed in bags with date, habitat and locality data. Upon identification the specimens were

placed in standard bryological packets made from 8.5 inch x 11 inch quality bond paper. Information recorded on the packet included specific epithet, sexual condition, collection site, habitat, collector's name, determiner's name, and collection number. Specimens collected in the field were corroborated by Dr. Charles B. Arzeni. Collecting areas were chosen after careful study of topographic maps, presettlement vegetation data, and a county plat book. Criteria for choosing these areas included drainage, differences in elevation, degree of forestation and ease of access.

Herbarium studies were also conducted during the course of this study. Some bryophyte material from Knox county was found at the Knox College Herbarium (KNOX), Galesburg. These collections were probably made by undergraduate students in an "embryophytes" class taught by Dr. George Ward (*pers. comm.*, Dr. Eugene Perry, Bio. Dept., Knox College). Herbaria at the University of Illinois (ILL) and Illinois Natural History Survey (ILLS) were also investigated. Herbarium specimens were examined and identifications annotated. Annotations of questionable misidentifications were corroborated by Dr. Charles B. Arzeni. Species determinations for mosses were made using keys from Crum (1983), Crum and Anderson (1981), and Welch (1957). The keys in Conard's (1979), Schuster's (1953), and Arzeni's (1950) publications were used for liverwort and hornwort determinations. Evans'(1987) treatment was helpful in

determining species of *Frullania*.

The accompanying annotated list includes substrate, collection site, date of collection, collection number, collector and location of voucher. Where more than one collection was made from the same site the data is connected with semicolons. Also included in this list is a rating of the frequency of occurence of species that were located in the field in Knox County. This frequency was based on empirical observations made during the study. Taxa considered abundant were those which were typically encountered at every collection site. Taxa described as frequent were those observed at a minimum of four sites. If observed at two or more sites the taxa was noted as occasional while if only encountered once it was considered rare. Unless otherwise noted collection numbers belong to the author and vouchers are located in the bryology herbarium at Eastern Illinois University, Room 107, Klehm Hall. Those vouchers found in the Knox College Herbarium are likewise noted. Nomenclature, except for a few species treated *sensu lato* (*s.l.*), follows Stotler and Crandall-Stotler (1977) for hornworts and liverworts, and Crum and Anderson (1981) and Crum (1983) for the mosses.

SUMMARY AND DISCUSSION

As a result of this study a total of 84 bryophytes (1 hornwort, 15 liverworts, 68 mosses) were found in Knox County. Of these taxa 82 are new county records though none

are new reports for Illinois. One previously reported hepatic, *Asterella tenella*, was not relocated during the field study. The voucher specimen believed to be the basis for this report, listed the location as "on brow of hill near Williamsfield in Victoria Township." Much of this township has been surface mined and it is quite probable this habitat no longer exists. The other previously reported hepatic, *Ricciocarpos natans*, was relocated in two places, neither from the same area as the earlier report. Of 82 new county records, six taxa (one liverwort and five mosses) found in collections at the Knox Herbarium were not relocated in the field.

Land use practices have made optimal bryophyte habitats, such as undisturbed woodlands and wetlands, rare in Knox County. An indication of this is the fact that many taxa are known from only a single location, even though most of these species are relatively common in the midwest. The only hornwort located, *Phaeoceros laevis* (L.) Prosk subs. *carolinianus*, (Michx.) Prosk. was found in one location, an old field, early successional situation, and is considered rare. Of the 13 liverworts located in the field all but 3 are considered rare. *Frullania eboracensis* Gott. is frequently observed and both *Lophocolea heterophylla* (Schrad.) Dum. and *Ricciocarpos natans* are occasionally encountered. Eleven species of mosses encountered in the field were considered abundant, 19 were frequent, 12 were occasional, and 21 occurred rarely.

There were some noteworthy finds in the field. Several pygmy ephemeral mosses including *Aphanorrhegma serratum* (J. Hook. & Wils. ex Drumm.) Sull., *Astomum muhlenbergianum* (SW.) Grout, *Ephemerum crassinervium* (Schwaegr) Hampe, *E. serratum* (Hedw.) Hampe, *E. spinulosum* Bruch & Schimp. ex Schimp., and *Phascum cuspidatum* Hedw. were found in the spring, late fall, and winter of 1990. In grain fields set aside for government conservation programs and excluded from cultivation, ephemeral mosses could be found in great quantity. It was also observed in two cornfields near Maquon that the soil in moist areas was covered with rosettes of *Riccia dictyospora* Howe and *Riccia sorocarpa* Bisch..

There are several interesting collecting localities remaining in Knox County that are worthy of mention. The spillway at Lake Storey was found to support lush growth of *Grimmia apocarpa* Hedw., mats of *Bryum pseudotriquetrum* (Hedw.) Gaertn., Meyer & Scherb. and *B. argenteum* Hedw., and a population of *Leskea obscura* Hedw.. Another notable location was New Truro Cemetery at the Knox College Biological Station (KCBS, four miles south of Victoria at T12N R4E S31). Although the surrounding area was disturbed by surface mining, the immediate vicinity of the cemetery was spared. This is the only location *Campylium hispidulum* (Brid.) Mitt., *Mnium affine* Bland. ex Funck var. *rugicum* (Laur.) BSG, *Plagiothecium cavifolium* (Brid.) Iwats., and *Thuidium delicatulum* (Hedw.) BSG were found. In general, this locality supported the most diverse community of

bryophytes including the common taxa as well as others which can be considered rare in the county. A steep shaded bank along the Spoon River provided an interesting habitat where *Marchantia polymorpha* L., *Reboulia hemisphaerica* (L.) Raddi, and *Ricciocarpos natans* were found in close association. The only location from which *Conocephalum conicum* (L.) Lindb. was found is a fragile habitat on the soil along the north side of the Seymour Union on the campus of Knox College. Although there was a profusion of this thalloid liverwort there, one visit from a zealous groundskeeper could mean the disappearance of *Conocephalum conicum* from Knox County.

This study should be considered a guide from which further study should be based and not all encompassing. The fact that one-third of the county was forested before settlement would suggest that there are remnant populations which went undiscovered during this survey.

ANNOTATED LIST OF BRYOPHYTES LOCATED DURING THIS FIELD STUDY

(New county records marked with *)

ANTHOCEROTAE - hornworts (1)

**Phaeoceros laevis* (L.) Prosk. subsp. *carolinianus* (Michx.) Prosk. -- On soil in old field, Varnold farm, west edge of Maquon, T9N R3E S4, 6 May 1990, *Cecil 87*. Rare.

HEPATICAE - liverworts (13)

**Conocephalum conicum* (L.) Lindb. -- On soil, north slope of coal spoil bank, KCBS, 1961, F. Hartman and R. Nelson *406* (KNOX). On shaded soil along north side of Seymour Union, Knox College campus in Galesburg, T11N R1E S15, 27 October 1990, *Cecil 183*. Rare.

Frullania bolanderi Aust. -- On *Acer* near Spoon River 1 mile southwest of Maquon, T9N R3E S9, 3 November 1990, *Cecil 188*. Rare.

Frullania eboracensis Gott. -- On log in woods near confluence of Spoon River and Snake Den Creek, T11N R4E S9, 1961, F. Hartman and R. Nelson *419 (KNOX)*. On *Acer* at south edge of prairie, KCBS, 6 October 1990, *Cecil 176*. Frequent.

Geocalyx graveolens (Schrad.) Nees -- On decorticated log in woods on north slope of wooded ridge 1/4 mile southwest of Maquon, T9N R3E S9, 5 June 1990, *Cecil 108b*. Rare.

Lophocolea heterophylla (Schrad.) Dum. -- On decorticated log in woods on north slope of wooded ridge 1/4 mile southwest of Maquon, T9N R3E S9, 5 June 1990, *Cecil 108a,109*. On stone in moist, shade ravine just west of New Truro Cemetery, KCBS, 5 October 1990, *Cecil 166*. On rotten log on west slope along Snake Den Creek, KCBS, 6 October 1990, *Cecil 182*. Occasional.

Lophocolea minor Nees -- On rotten log in hollow 1/2 mile west of terminis of main road at KCBS, misidentified as *Chyloscyphus pallescens*, 1961, F. Hartman and R. Nelson *421 (KNOX)*. On rotten log on west slope along Snake Den Creek, KCBS, 6 October 1990, *Cecil 182*. Rare.

Marchantia polymorpha L. -- On moist, shaded rock near stream, Lake Bracken, T10N R1E S14, 1973, E. Uhlemann *(KNOX)*. On soil of steep moist bank of Spoon River 1 mile southwest of Maquon, T9N R3E S9, 3 November 1990, *Cecil 187*. Rare.

Porella platyphylloidea (Schwein.) Lindb. -- In knothole at base of *Populus* along creek in wooded ravine 1/4 mile west of Maquon, T9N R3E S4, 20 April 1990, *Cecil 74*. Rare.

Ptilidium pulcherrimum (G. Web.) Hampe -- On decorticated log in woods on north slope of ridge 1/4 mile southwest of Maquon, T9N R3E S9, 5 June 1990, *Cecil 108c*. On decaying log at bottom of ravine 300 yds north of New Truro Cemetery, KCBS, 6 October 1990, *Cecil 178*. Rare.

Reboulia hemisphaerica (L.) Raddi -- On soil of steep, moist bank of Spoon River 1 mile southwest of Maquon, T9N R3E S9, 3 November 1990, *Cecil 186*. Rare.

Riccia dictyospora Howe -- On disturbed wet soil in waterway through cornfield, 1 mile south of Maquon, T9N R3E S10, 11 November 1990, *Cecil 189*. Rare.

Riccia sorocarpa Bisch. -- On disturbed moist soil in low area of cornfield on west edge of Maquon, T9N R3E S4, 20 November 1990, *Cecil 190*. Rare.

Ricciocarpos natans (L.) Corda -- From a stripmine impoundment in association with *Lemna minor*, T12N R3E S35, M. J. Chimney, 3 March 1983, no voucher. On mud on bank of Spoon River 1 mile southwest of Maquon, T9N R3E S9, 6 October 1990, *Cecil 144*. On sandy silt along bank of Spoon River at Wolf Covered Bridge on County Highway 17, 5 miles east of Gilson, T10N R3E S13, 6 October 1990, *Cecil 168*. Occasional.

MUSCI - mosses (63)

**Amblystegium humile* (P.-Beauv.) Crundw. *s.l.* On soil in old field, T9N R3E S4, 20 April 1990, *Cecil 73*. On rock near creek in wooded ravine just west of Maquon, T9N R3E S4, 20 April 1990, *Cecil 95, 99*. Occasional.

**Amblystegium riparium* (Hedw.) BSG -- On rock in stream 1 mile east of Galesburg, T11N R1E S3, misidentified as *Hygrohypnum closteri*, 1961, F. Hartman and R. Nelson, *435 (KNOX)*. On soil in springy seep near creek, B. Cecil farm 1 mile south of Maquon, T9N R3E S15, 21 April 1990, *Cecil 77*. Frequent.

**Amblystegium serpens* (Hedw) BSG -- On wet clay in spoil banks,KCBS, misidentified as *Homomallium adnatum*, 1961, F. Hartman and R. Nelson, *405 (KNOX)*. On rocks in stream, T15N R1E S3, misidentified as *Hygrohypnum closteri*, 1961, F. Hartman and R. Nelson, *435 (KNOX)*. On rotten log, KCBS, misidentified as *Brachythecium acutum*, 1961, F. Hartman and R. Nelson, *429 (KNOX)*. On soil in springy area, Varnold farm 3 miles west of Maquon, T9N R3E S8, 30 July 1990, *Cecil 111*. Occasional.

**Amblystegium varium* (Hedw.) Limpr. *s.l.* -- On soil in springy seep area near creek, B. Cecil farm 1 mile south of Maquon, T9N R3E S15, 21 April 1990, *Cecil 79*. Frequent.

**Anacamptodon splachnoides* (Froel. ex Brid.) Brid. -- In knothole on *Populus* along main road , KCBS, 20 November 1990, *Cecil 191*. Rare.

**Anomodon attenuatus* (Hedw.) Hüb. -- On soil in wooded creek bottom, KCBS, 1961, F. Hartman and R. Nelson, *413 (KNOX)*. Near Snake Den Creek, KCBS, 1972, C. Sebesta, misidentified as *Atrichum undulatum, (KNOX)*. On base of dead hardwood on wooded ridge 1/4 mile southwest of Maquon, T9N R3E S9, 1 September 1990, *Cecil 139*. On *Quercus* 200 yards north of New Truro Cemetery, KCBS, 6 October 1990, *Cecil 180*. Frequent.

**Anomodon minor* (Hedw.) Fürnr. -- On base of *Populus* in wooded ravine, Prall farm just west of Maquon, T9N R3E S4, 20 April 1990, *Cecil 83*. On brick in woods, T9N R3E S4, 20 April 1990, *Cecil 89*. On base of *Quercus* on wooded ridge 1/4

mile southwest of Maquon, T9N R3E S9, 1 September 1990, *Cecil 140*. Frequent.

**Anomodon rostratus* (Hedw.) Schimp. -- On base of *Populus deltoides* in wooded ravine, Prall farm just west of Maquon, T9N R3E S4, 20 April 1990, *Cecil 84*. On roots of *Carya* in wooded ravine, Faucon farm 1 mile west of Maquon, T9N R3E S8, 11 August 1990, *Cecil 117*. Frequent.

**Aphanorrhegma serratum* (J. Hook. & Wils. ex Drumm.) Sull. -- On soil in woods on ridge 1/4 mile south of Maquon, T9N R3E S9, *Cecil 123c*. On mud on bank of Spoon River 1 mile southwest of Maquon, T9N R3E S9, 4 October 1990, *Cecil 145*. Frequent.

**Astomum muhlenbergianum* (Sw.) Grout -- On soil at edge of field, Prall farm, T9N R3E S4, 20 April 1990, *Cecil 69*. On soil covering roots of fallen tree 250 yards east of New Truro Cemetery at KCBS, 5 October 1990, *Cecil 167*. Occasional.

**Atrichum angustatum* (Brid.) BSG -- moist soil in spoil banks, KCBS, 1961, F. Hartman and R. Nelson, *408, 409* (misidentified as *Atrichum undulatum*), *(KNOX)*. On moist soil near spring, Prall farm, T9N R3E S4, *Cecil 96*. On soil in woods near Lake Storey, Galesburg, T12N R1E S32, 29 July 1990, *Cecil 110*. On soil in mesic woods along south shore of Lake Storey, Galesburg, T12N R1E S32, 1 September 1990, *Cecil 138*. Abundant.

**Atrichum undulatum* (Hedw.) P. - Beauv. *s.l.* -- On clay bank of creek in ravine just west of New Truro cemetery at KCBS, 5 October 1990, *Cecil 165*. Occasional.

**Aulacomnium heterostichum* (Hedw.) BSG -- On moist soil in woods on north edge of New Truro Cemetery at KCBS, 6 October 1990, *Cecil 172*. Rare.

**Barbula unguiculata* Hedw. -- On edge of gravel road through prairie, KCBS, 2 September 1990, *Cecil 130*. On soil in mesic woods along south shore of Lake Storey, Galeburg, T12N R1E S32, 1 September 1990, *Cecil 137*. On soil in old Trenton Cemetery on Rt150, T12N R1E S25, 6 October 1990, *Cecil 174*. Frequent.

**Brachythecium acuminatum* (Hedw.) Aust. -- On log in woods near eastern terminis of main road, KCBS, misidentified as *Amblystegium serpens*, 1961, F. Hartman and R. Nelson, *420 (KCBS)*. On base of *Acer* in mesic woods near eastern terminis of main road, KCBS, 14 February 1991, *Cecil 201*. On *Populus* in spoil banks 1/4 mile northeast of main entrance, KCBS, 14 February 1991, *Cecil 202*. Frequent.

**Brachythecium oxycladon* (Brid.) Jaeg. & Sauerb. On soil in animal path in springy area, B. Cecil farm 1 mile south of

Maquon, T9N R3E S15, 20 April 1990, *Cecil 100a*. On soil in mesic woods on south shore of Lake Storey, Galesburg, T12N R1E S32, 1 September 1990, *Cecil 124*. Abundant.

**Brachythecium salebrosum* (Web. & Mohr) BSG -- On soil near spring, Prall farm, T9N R3E S4, 20 April 1990, *Cecil 93*. On sand near creek in wooded ravine just west of Maquon, T9N R3E S4, 20 April 1990, *Cecil 94*. On soil on hillside above Spoon River, T10N R3E S34, 11 August 1990, *Cecil 119*. On soil in trees at edge of prairie, KCBS, 2 September 1990, *Cecil 134*. Abundant.

**Bryhnia graminicolor* (Brid.) Grout -- On decorticated wood, Pruitt farm on west edge of Maquon, T9N R3E S4, 20 April 1990, *Cecil 102*. On soil in mesic woods along south shore of Lake Storey, Galesburg, T12N R3E S32, 1 September 1990, *Cecil 136*. Frequent.

Bryoandersonia illecebra (Hedw.) Robins -- On soil in woods on ridge 1/4 mile north of terminis of main road, KCBS, 21 February 1991, *Cecil 203*. Rare.

**Bryum argenteum* Hedw. -- On soil at edge of field, Prall farm, T9N R3E S4, 20 April 1990, *Cecil 70b*. On concrete of spillway at Lake Storey, Galesburg, T12N R1E S32, 6 October 1990, *171*. Abundant.

**Bryum caespiticium* Hedw. -- On soil of old anthill on ridge, KCBS, 1961, F. Hartman and R. Nelson, *430 (KNOX)*. On soil at base of *Acer* in Lake Storey Park, Galesburg, T12N R1E S32, 1 September 1990, *Cecil 128*. On edge of gravel road through prairie KCBS, 2 September 1990, *Cecil 129*. Frequent.

**Bryum pseudotriquetrum* (Hedw.) Gaertn., Meyer & Scherb. -- On concrete of spillway, forming mats, at Lake Storey, Galesburg, T12N R1E S32, 6 October 1990, *Cecil 170*. Rare.

**Campylium chrysophyllum* (Brid.) J. Lange -- On decaying log in mesic woods on north side of New Truro Cemetery at KCBS, 5 October 1990, *Cecil 164*. On soil in old Trenton Cemetery on RT150, T11N R3E S25, 6 October 1990, *Cecil 173; 181*. Occasional.

**Campylium hispidulum* (Brid.) Mitt. -- On soil in mesic woods on north edge of New Truro Cemetery at KCBS, 5 October 1990, *Cecil 162*. Rare.

**Ceratodon purpureus* Kindb. ex Macoun -- on coal spoil bank, KCBS, 1961, F. Hartman and R. Nelson, *427 (KNOX)*. On roof of old building near main entrance to KCBS, 21 February 1991, *Cecil 204*. Occasional.

**Desmatodon obtusifolius* (Schwaegr.) Schimp. -- On bare soil in old field 3/4 mile southeast of main entrance at

KCBS, misidentified as *Desmatodon convolutus*, 1961, F. Hartman and R. Nelson, *423 (KNOX)*. On tombstone in overgrown cemetery circa 1860, Varnold farm on west edge of Maquon, T9N R3E S4, 20 April 1990, *Cecil 75*. Rare.

**Dicranella heteromalla* (With.) Schimp. -- On clay and gravel on ridge in spoil banks, KCBS, 1961, F. Hartman and R. Nelson, *407 (KNOX)*. On soil near path on ridge in woods 1/4 mile east of eastern terminis of main road, KCBS, 14 February 1991, *Cecil 199*. Occasional.

**Dicranella varia* (Hedw.) Schimp. -- On soil in spoil banks, KCBS, F. Hartman and R. Nelson, *402 (KNOX)*. On soil on creek bank in wooded ravine just west of Maquon, T9N R3E S4, 20 April 1990, *Cecil 104*. Rare.

**Dicranum montanum* Hedw. -- On soil at base of *Quercus* in woods near Lake Storey, Galesburg, T12N R1E S32, 29 July 1990, *Cecil 122*. On soil at edge of woods, along ravine just west of Maquon, T9N R3E S4, 1 September 1990, *Cecil 135*. On decaying log 300 yards northeast of New Truro Cemetery, KCBS, 6 October 1990, *Cecil 177*. Frequent.

**Ditrichum pallidum* (Hedw.) Hampe -- On soil in woods 400 yards northeast of New Truro Cemetery at KCBS, 5 October 1990, *Cecil 149*. Occasional.

**Entodon cladorrhizans* (Hedw.) C.M. -- On log in woods 1/4 mile northeast of eastern terminis of main road, KCBS, 1961, F. Hartman and R. Nelson, *400 (KNOX)*. On log in ravine 1/4 mile east of eastern terminis of main road, KCBS, 14 February 1991, *Cecil 197*. Rare.

**Entodon seductrix* (Hedw.) C.M. -- On decorticated wood, Pruitt farm on west edge of Maquon, T9N R3E S4, 20 April 1990, *Cecil 103*. On log in wooded ravine, Faucon farm 1 mile west of Maquon, T9N R3E S8, 11 August 1990, *Cecil 115*. Abundant.

**Ephemerum crassinervium* (Schwaegr.) Hampe -- On soil at edge of field among *Phascum*, Prall farm, T9N R3E S4, 20 April 1990, *Cecil 71*. Occasional.

**Ephemerum serratum* (Hedw.) Hampe -- On soil in old cemetery on west side of HWY 8 in Herman, T9N R2E S18, 10 December 1990, *Cecil 193*. Rare.

**Ephemerum spinulosum* Bruch & Schimp. ex Schimp. -- On soil in woods on ridge 1/4 mile southwest of Maquon, T9N R3E S9, 5 June 1990, *Cecil 123a*. Rare.

**Eurhynchium hians* (Hedw.) Sande-Lac. -- On shale along creek in wooded ravine just west of Maquon, T9N R3E S4, 20 April 1990, *Cecil 91*, on rock *Cecil 99c*. On soil in mesic woods along south shore of Lake Storey, Galesburg, T12N

R1E S32, 1 September 1990, *Cecil 126*. Abundant.

**Eurhyncium pulchellum* (Hedw.) Jenn. -- On rock in creekbed in wooded ravine just west of Maquon, T9N R3E S4, 20 April 1990, *Cecil 98*. On soil, T9N R3E S4, 20 April 1990, *Cecil 107*. Frequent.

**Fissidens bryoides* Hedw. -- On moist stone on shaded north slope, KCBS, misidentified as *Fissidens osmundioides*, 1961, F. Hartman and R. Nelson, *412 (KNOX)*. On rocks in ravine just west of New Truro Cemetery at KCBS, 5 October 1990, *Cecil 150*. Rare.

**Fissidens taxifolius* Hedw. -- On moist soil along stream, KCBS, 1961, F. Hartman and R. Nelson, *415 (KNOX)*. On clay bank of creek in wooded ravine, Faucon farm, 1 mile west of Maquon, T9N R3E S8, 11 August 1990, T9N R3E S8, *Cecil 113*. On soil in mesic woods along south shore of Lake Storey, Galesburg, T12N R1E S32, *Cecil 125*. On soil in trees along road through prairie, KCBS, 2 September 1990, *Cecil 141*. On clay bank of creek in ravine just west of New Truro Cemetery at KCBS, 5 October 1990, *Cecil 160*. Frequent.

**Funaria hygrometrica* Hedw. -- On soil along Santa Fe railroad on east edge of Galesburg, 1968, G. Ward, *(KNOX)*. On moist soil at edge of prairie, KCBS, 2 September 1990, *Cecil 132*. On clay bank of creek in ravine just west of New Truro Cemetery at KCBS, 5 October 1990, *Cecil 163*. Frequent.

**Grimmia apocarpa* Hedw. -- On tombstone (1860) in New Truro Cemetery at KCBS, 5 October 1990, *Cecil 147*. On concrete of spillway at Lake Storey, Galesburg, T12N R1E S32, 6 October 1990, *Cecil 169*. On tombstone (1873) in cemetery on east side of HWY 8 in Herman, T9N R2E S18, 10 December 1990, *Cecil 192*. Occasional.

**Hygroamblystegium tenax* (Hedw.) Jenn. *s.l.* -- On iron pipe in springy area, Varnold farm 3 miles west of Maquon, T9N R3E S8, 30 July 1990, *Cecil 112*. Rare

**Leskea gracilescens* Hedw. -- On *Ulmus*, KCBS, On log (misidentified as *Leskea polycarpa*) , 1961, F. Hartman and R. Nelson, *403; 399 (KNOX)*. On base of *Gleditsia* in spoil banks, KCBS, 1962, M. Lawton, *1; 2* (misidentified as *Leskea arrnicola*); *3* (misidentified as *Amblystegium varium*), *(KNOX)*. On dead branch , KCBS, 1972, C. Sebesta, *(KNOX)*. On exposed roots of fallen tree, overgrown cemetery on Varnold farm, west edge of Maquon, T9N R3E S4, 20 April 1990, *Cecil 86a*. On log in wooded ravine just west of Maquon, T9N R3E S4, 20 April 1990, *Cecil 100b*. On base of dead tree on wooded ridge 1/4 mile southwest of Maquon, T9N R3E S9, 5 June 1990, *Cecil 121*. Abundant.

Leskea obscura Hedw. -- On concrete of spillway at Lake Storey, T12N R1E S32, 6 October 1990, *Cecil 175*. Rare.

Leskeella nervosa (Brid.) Loeske -- On bark of *Quercus alba* on north shore of Lake Storey, T12N R1E S33, 6 October 1990, *Cecil 179*. Rare.

Mnium affine Bland. ex Funck var. *rugicum* (Laur.) BSG -- On moist shaded soil on hillside just west of New Truro Cemetery at KCBS, 5 October 1990, *Cecil 146*. Rare.

Mnium cuspidatum Hedw. -- On moist soil in hollow, KCBS, 1961, F. Hartman and R. Nelson, *426 (KNOX)*. On soil near Snake Den Creek, KCBS, 1972, C. Sebesta, *(KNOX)*. On soil in old field, T9N R3E S4, 20 April 1990, *Cecil 72*. On soil along animal trail, T9N R3E S4, 20 April 1990, *Cecil 92*. On soil near spring, T9N R3E S4, 20 April 1990, *Cecil 93a*. On rock in creekbed, T9N R3E S4, 20 April 1990, *Cecil 99*. On soil in trees along road through prairie, KCBS, 2 September 1990, *Cecil 142*. Abundant.

Mnium medium BSG -- On soil along brook at bottom of north slope of wooded ridge 1/2 mile southwest of Maquon, T9N R3E S4, 18 December 1990, *Cecil 196*. Rare.

Orthotrichum pumilum Sw. -- On bark of *Juglans*, 1/4 mile south of eastern terminis of main road, KCBS, misidentified as *Orthotrichum sordidum*, 1961, F. Hartman and R. Nelson, *411 (KNOX)*. On *Ulmus* in old brickyard in East Galesburg, T11N R2E S17, 11 December 1990, *Cecil 195*. Occasional.

Orthotrichum pusillum Mitt. -- On exposed roots of fallen tree in old overgrown cemetery, Varnold farm on west edge of Maquon, T9N R3E S4, 20 April 1990, *Cecil 85,*. On *Malus*, Knox College campus, Galesburg, T11N R1E S15, 27 October 1990, *Cecil 184*. Occasional.

Orthotrichum strangulatum P. - Beauv. -- On limestone in creekbed in wooded ravine, Faucon farm 1 mile west of Maquon, T9N R3E S8, 11 August 1990, *Cecil 116*. Rare.

Phascum cuspidatum Hedw. -- On soil at edge of field, Prall farm, T9N R3E S4, 20 April 1990, *Cecil 70*. On soil in old field, Varnold farm, T9N R3E S4, 20 April 1990, *Cecil 88; 106b*. Frequent.

Physcomitrium pyriforme (Hedw.) Hampe -- On bare soil in old field, KCBS, 1961, F. Hartman and R. Nelson, *433 (KNOX)*. On soil in old field, Varnold farm on west edge of Maquon, T9N R3E S4, 20 April 1990, *Cecil 76; 101; 106a*. Abundant.

Plagiothecium cavifolium (Brid.) Iwats. -- On humus in mesic woods on north edge of New Truro Cemetery at KCBS, 5 October 1990, *Cecil 148*. Rare.

Platygyrium repens (Brid.) BSG -- On log in woods, KCBS, 1961, F. Hartman and R. Nelson, *394 (KNOX)*. On log near creek, B. Cecil farm, T9N R3E S15, 21 April 1990, *Cecil 80*. On log in shaded corner of field, Pruitt farm , T9N R3E S4, 20 April 1990, *Cecil 81*. On log in woods, Prall farm, T9N R3E S4, 20 April 1990, *Cecil 82*. Abundant.

Pleuridium subulatum (Hedw.) Rabenh. -- On limestone in creekbed in wooded ravine, Faucon farm 1 mile west of Maquon, T9N R3E S8, 11 August 1990, *Cecil 118*. On soil in woods on ridge 1/4 mile southwest of Maquon, T9N R3E S9, 5 June 1990, *Cecil 123b*. Frequent.

Pohlia wahlenbergii (Web. & Mohr) Andr. -- On soil of creek bank in wooded ravine just west of Maquon, T9N R3E S4, 20 April 1990, *Cecil 105*. On soil at edge of tallgrass prairie, KCBS, 2 September 1990, *Cecil 131*. Frequent.

Pylasiella selwynii (Kindb.) Crum, Steere & Anders. -- On bark of tree in woods near eastern terminis of main road, KCBS, 1961, F. Hartman and R. Nelson, *401 (KNOX)*. On log in ravine 1/4 mile east of eastern terminis of main road, KCBS, 14 February 1991, *Cecil 198*. Rare.

Rhynchostegium serrulatum (Hedw.) Jaeg. & Sauerb. -- On soil at base of tree in woods, KCBS, 1961, F. Hartman and R. Nelson, *396 (KNOX)*. On rock in hollow, KCBS, misidentified as *Campylium chrysophyllum*, 1961, F. Hartman and R. Nelson, *397 (KNOX)*. On soil in old field, west edge of Maquon, T9N R3E S4, 20 April 1990, *Cecil 90*. On shale near creek in wooded ravine just west of Maquon, T9N R3E S4, 20 April 1990, *Cecil 97*. On clay bank of creek in wooded ravine, Faucon farm 1 mile west of Maquon, T9N R3E S8, 11 August 1990, *Cecil 114*. Abundant.

Thuidium delicatulum (Hedw.) BSG -- On soil in woods along Snake Den Creek near confluence with Spoon River, T11N R4E S9, 1961, F. Hartman and R. Nelson, *418 (KNOX)*. On soil in mesic woods on north edge of New Truro Cemetery at KCBS, 5 October 1990, *Cecil 161*. Rare.

Thuidium recognitum (Hedw.) BSG -- On soil near path on ridge in woods 1/4 mile east of eastern terminis of main road, KCBS, 14 February 1991, *Cecil 200*. Rare.

Tortella humilis (Hedw.) Jenn. -- On shale in spoil banks, KCBS, misidentified as *Ditrichum pusillum*, 1961, F. Hartman and R. Nelson, *410 (KNOX)*. On soil in path on top of wooded ridge 1/4 mile southwest of Maquon, T9N R3E S9, 5 June 1990, *Cecil 120*. On soil at edge of prairie, KCBS, 2 September 1990, *133*. On bare soil on trail in woods along Spoon River 1 mile southwest of Maquon, T9N R3E S9, 4 October 1990, *143*. Frequent.

Weissia controversa Hedw. -- On soil of old anthill on ridge, KCBS, 1961. On moist soil in woods, KCBS, (misidentified as *Dicranoweisia crispula*), 1961, F. Hartman and R. Nelson, *425; 428 (KNOX)*. On disturbed soil at roadside near Lake Rice in East Galesburg, T11N R2E S7, 11 December 1990, *Cecil 194*. Frequent.

ANNOTATED LIST OF BRYOPHYTES NOT RELOCATED DURING THIS FIELD STUDY

HEPATICAE (2)

Aneura pinguis (L.) Dum. -- On wet soil near stagnant pond in coal spoil banks, KCBS, 1961, F. Hartman and R. Nelson, *404* (KNOX).

Asterella tenella (L.) P. - Beauv. -- On soil on brow of hill in opening in woods near Williamsfield, T11N, 1908, V. Chase, *I672* (ILL). This is the only previous report not relocated during the study.

MUSCI (5)

Bartramia pomiformis Hedw. -- On clay on moist slope near Lake Bracken, T10N R1E S14, 1973, E. Uhlemann, *(KNOX)*.

Climacium americanum Brid. -- On moist shade soil on north slope along Snake Den Creek, KCBS, 1961, F. Hartman and R. Nelson; *414 (KNOX)*; 1972, C. Sebesta, *(KNOX)*; 1973, E. Uhlemann, *(KNOX)*.

Entodon compressus C.M. -- On base of *Quercus* in woods near eastern terminis of main road, KCBS, F. Hartman and R. Nelson, *395 (KNOX)*.

Pohlia nutans (Hedw.) Lindb. -- On soil in prairie, 1 mile east of Galesburg, misidentified as *Bryum capillare*, 1961. F. Hartman and R. Nelson, *431 (KNOX)*.

Polytrichum ohioense Ren. & Card. -- On soil on ridge in woods 100 yards north of Kraft field, KCBS, 1961, F. Hartman and R. Nelson, *422 (KNOX)*.

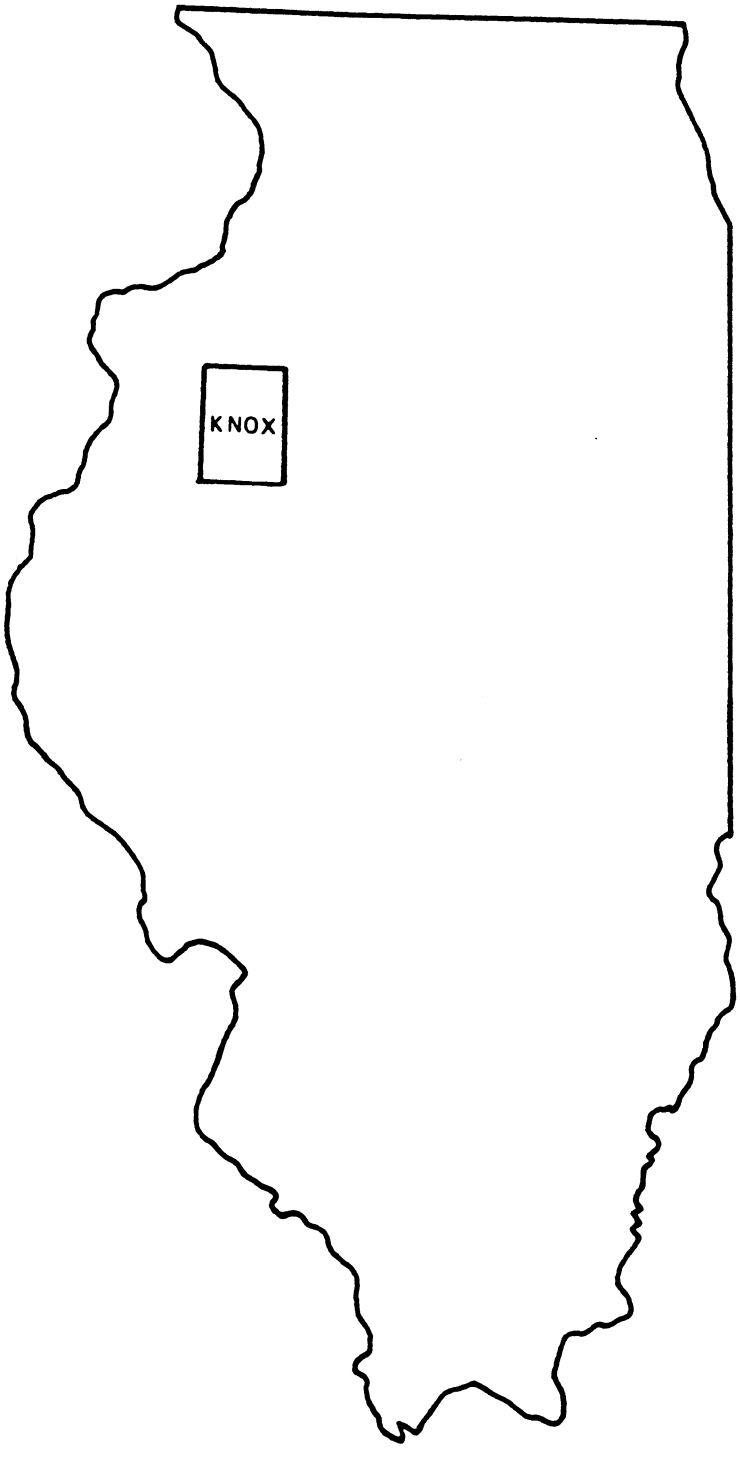

Figure 1. Map showing location of Knox County in Illinois.

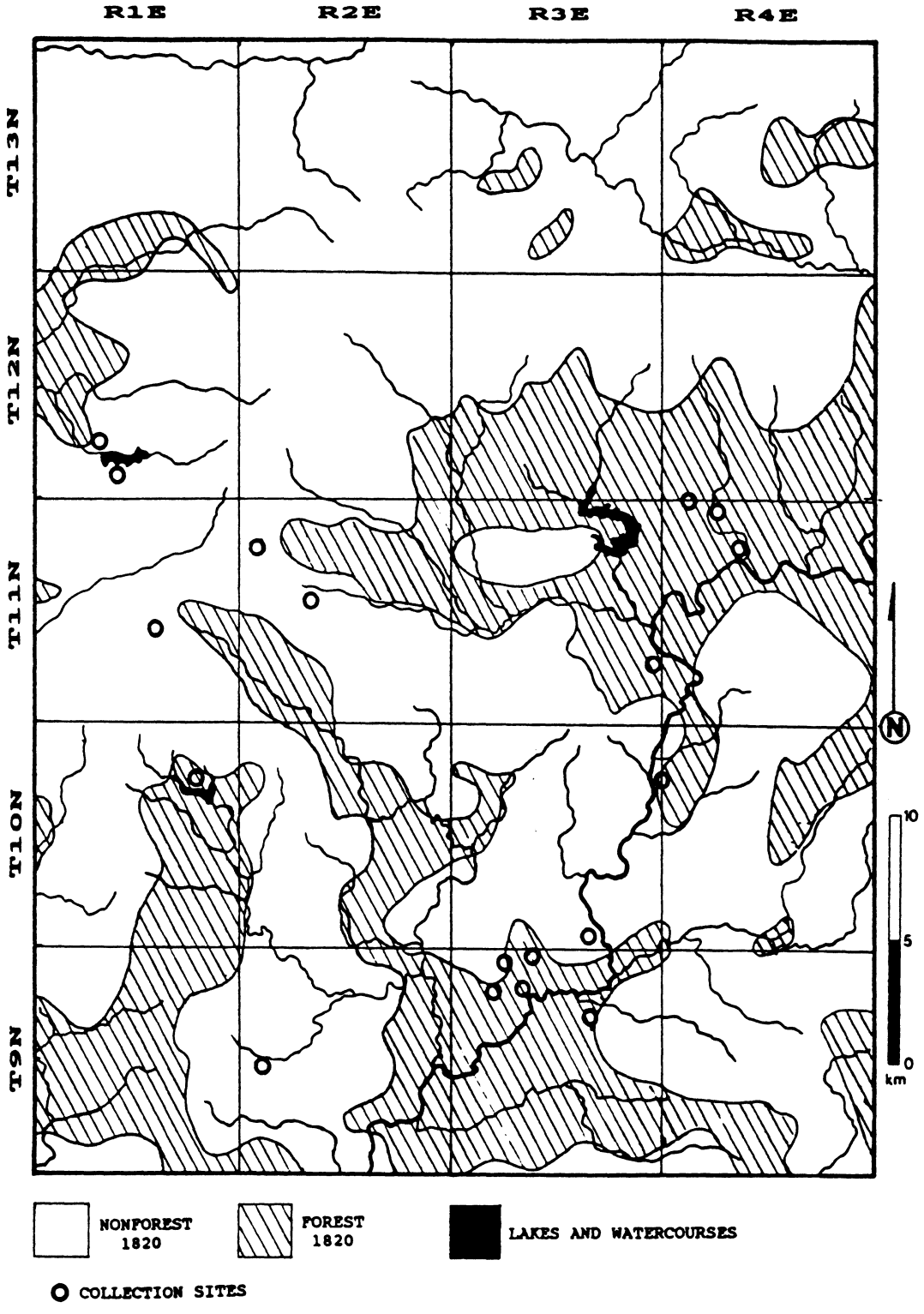

Figure 2. Presettlement vegetation map of Knox County, Illinois showing collection sites; based on map (Forest Cover in Illinois 1820-1980) prepared by L. Iverson and M. Joselyn (1989) of the Illinois Natural History Survey.

LITERATURE CITED

Arzeni, C.B. 1950. The Hepaticae of the Douglas Lake Region, Michigan. Edwards Bros. Inc., Ann Arbor, Michigan. 30 p.

Brendel, F. 1859. Additions and annotations to Mr. Lapham's catalogue of Illinois plants. Trans. Illinois State Agri. Soc. 3:583-587.

Brendel, F. 1882a. Flora Peoriana. Die vegetation im clima von mittel-Illinois. Termeszetrajzi Fuzetek 5:299-405.

Brendel, F. 1882b. Flora Peoriana. A catalogue of plants observed and collected in the vicinity of Peoria, Ill., 1852-1877, by Fred Brendel. The Pharmicist and Chemist 15:263-268, 291-299.

Brendel, F. 1887. Flora Peoriana. The vegetation in the climate of middle Illinois. J.W. Franks and Sons, Peoria, Illinois. 89p.

Burnette, D.C. 1981. Bryophytes of Rocky Branch Nature Preserve, Clark County, Illinois. M.S. thesis. Eastern Illinois University, Charleston. v + 107 p.

Chapman, Charles C. & Co. 1878. History of Knox County. Blakely, Brown & Marsh, Printers. Reproduced by Unigraphic, Inc., Evansville, Indiana. 670 p.

Chimney, M.J. 1984. First report of *Ricciocarpus natans* (L.) Corda (Marchantiales:Ricciaceae) from a strip mine impoundment. Trans.Illinois State Acad. Sci. 77:43-44.

Conard, H.S. 1979. How to know the mosses and liverworts. 2nd ed. Revised by P.L. Redfearn, Jr. Wm.C. Brown Co. Publ., Dubuque, Iowa. xi + 302 p.

Crum, H.A. 1983. Mosses of the Great Lakes forest. 3rd ed. University of Michigan Herbarium, Ann Arbor. 417 p.

Crum, H.A. and L.E. Anderson. 1981. Mosses of eastern North America. 2 vols. Columbia University Press, New York. 1328 p.

Evans, A.W. 1897. A revision of the North American species of *Frullania*, a genus of Hepaticae. Trans.Conn.Acad. Sci. vol.X. 39 p. + 15 pls.

Fehrenbacher, J.B., I.J. Jansen, B.W. Ray, J.D. Alexander, and T.S. Harris. 1977. Soil associations of Knox County, Illinois. Univ. of Ill., Coll. of Agric., Spec. Publ. 46, 27 p.

Hague, S.M. 1930. IIlinois mosses. Trans. Illinois State Acad. Sci. 22:220-249.

Hague, S.M. 1937. Illinois liverworts. Trans. Illinois State Acad. Sci. 30:118-124.

Hague, S.M. and R.V. Drexler. 1938. Recent collections of Illinois liverworts. Trans. Illinois State Acad. Sci. 31:113-114.

Iverson, L.R. 1989. Forest resources of Illinois: an atlas and analysis of spatial and temporal trends. Illinois Natural History Survey Special Publication 11. 181p.

McCleary, J.A., and P.L. Redfearn, Jr. 1979. Checklist of the mosses Illinois. Trans. Illinois State Acad. Sci. 72(2):28-51.

McKnight, B.N. 1987. The bryophytes of Illinois: an annotated and indexed bibliography and checklist. Illinois Natural History Biological Notes No. 127. 41p.

Schuster, R.M. 1953. Boreal Hepaticae, a manual of the liverworts of Minnesota and adjacent regions. American Midland Naturalist 49:257-684.

Schwegman, J.E., G.B. Fell, M. Hutchison, G. Paulson, W.M. Shephard, and J. White. 1973. Comprehensive plan for the Illinois Nature Preserves System, Part 2--The Natural Divisions of Illinois. Illinois Nature Preserves Commission, Rockford. 32p. + map.

Spessard, L.L. 1972. The bryophytes of Shelby County. M.S. thesis. Eastern Illinois University, Charleston. viii + 430 p.

Stotler, R., and B. Crandall-Stotler. 1977. A checklist of the liverworts and hornworts of North America. Bryologist 80:405-428.

United States Department of Commerce, Bureau of the Census. 1980. 1978 Census of agriculture, preliminary report--Knox County, Illinois. 4 p.

Welch, W.H. 1957. Mosses of Indiana: an illustrated manual. The Bookwalter Co. 478 p.

White, J., 1978. Illinois Natural Areas Inventory Technical Report: volume 1, survey methods and results. Illinois Natural Areas Inventory. 426 p.

Willman, H.B., and John C. Frye. 1970. Pleistocene stratigraphy of Illinois. Ill. Geol. Surv. Bull. 94, 204 p.

Windhorn, R.D. 1986. Soil Survey of Knox County, Illinois. Ill. Agri. Exp. Sta. Soils Report No. 127. 161 p. + 105 maps.

Wolf, J., and E. Hall. 1878. A list of the mosses, liverworts and lichens of Illinois. Bulletin of the Illinois State Laboratory of Natural History 1:18-35.