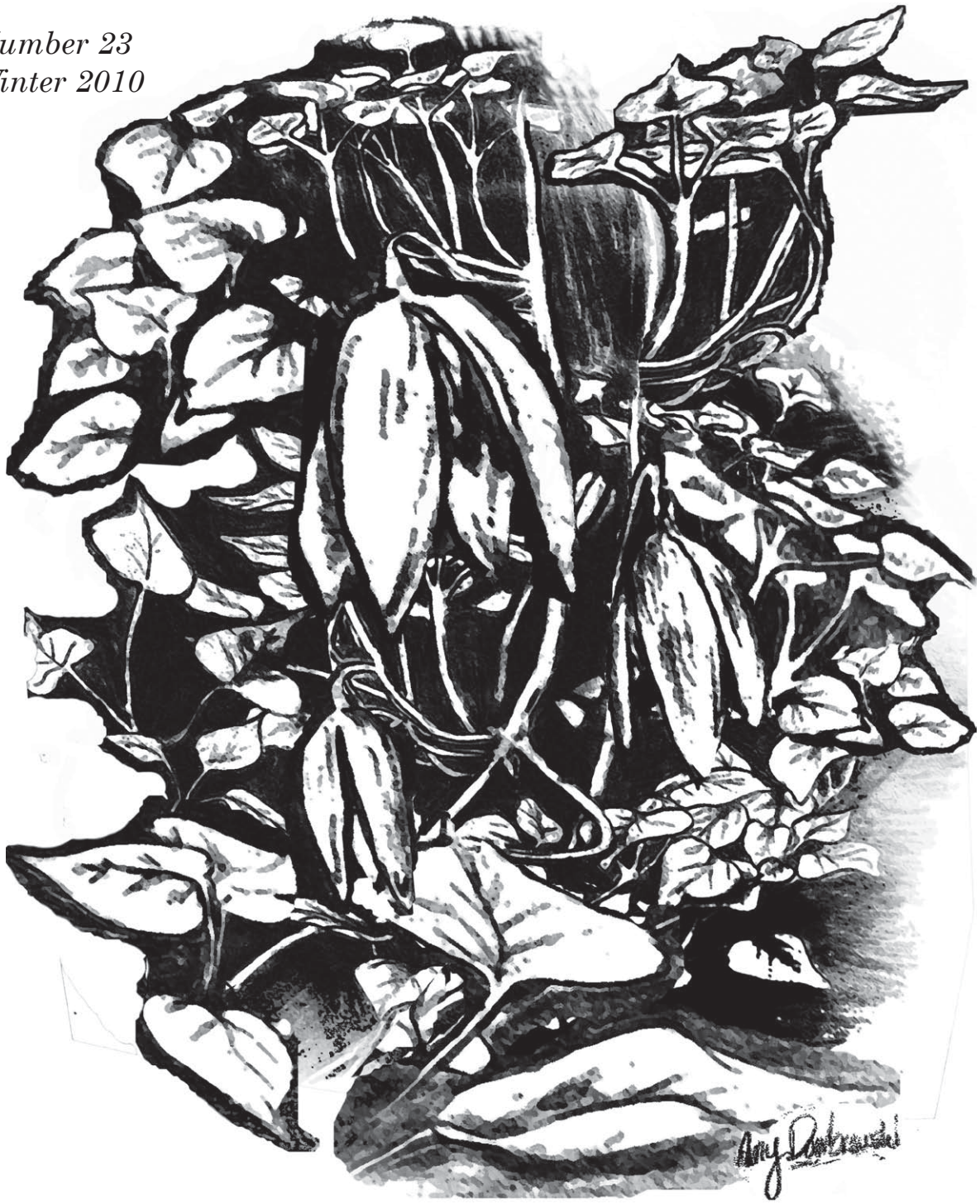
ERIGENIA

Number 23
Winter 2010



Journal of the
Illinois Native Plant Society

ERIGENIA

Number 23, Winter 2010

The Illinois Native Plant Society Journal

The Illinois Native Plant Society is dedicated to the preservation, conservation, and study of the native plants and vegetation of Illinois.

MEMBERSHIP

Yearly membership includes a subscription to *Erigenia* and the quarterly newsletter, *Harbinger*. For more information, visit our website at www.ill-inps@org or write to:

Illinois Native Plant Society
P.O. Box 3341
Springfield, Illinois 62708
e-mail: ilnps@aol.com

ERIGENIA is named for *Erigenia bulbosa* (Michx.) Nutt. (harbinger of spring), one of our earliest blooming woodland plants. The first issue was published in August, 1982.

(ISSN 8755-2000)

COVER ILLUSTRATION: Drawing of *Clematis verticillaris* (Schwegman perspective) by Amy Dombrowski.

Greetings.

Thanks, to all of you, for helping recruit quality articles for this issue of Erigenia. We are getting back on track and starting a new cycle of articles. Please pass on my request to your friends and colleagues to publish in our journal. We have received numerous comments on the high quality of our small publication based on a volunteer organization. Thank you all.

Tracy Evans, Editor

ERIGENIA
NUMBER 23, WINTER 2010

TABLE OF CONTENTS

About Our Authors

Samantha Adams Childerson is a graduate student at Eastern Illinois University. Her interests include restoration and management of prairies and conservation of rare plant species.

Linda Wilson Curtis has a B.S. from University of Wisconsin-Stevens Point and a M.S. in Botany from University of Wisconsin-Milwaukee. She is author of Aquatic Plants of Northeastern Illinois, and Woodland Carex of the Upper Midwest as well as magazine articles on sedges and entomology.

Amy Dobrowski has a B.S. from Lewis University and is currently pursuing a M.S. in Natural Resources and Environmental Science at the University of Illinois Champaign-Urbana. She is an employee with the U.S. Forest Service at Midewin National Tallgrass Prairie in Wilmington.

John E. Ebinger is emeritus professor of botany at Eastern Illinois University. His research focuses on the structure and composition of forest, glade and sand prairie communities in Illinois as well as the tropical genus *Acacia*.

Bob Edgin is a field representative for the Illinois Nature Preserves Commission. His research focuses on the structure and composition of forest and prairie communities and population dynamics of endangered plant species within Illinois nature preserves.

Paul Marcum is an academic professional/wetland plant ecologist with the Illinois Natural History Survey, University of Illinois' Institute of Natural Resource Sustainability. His research focuses on the flora and plant community quality and composition within our remaining high quality natural areas.

Michael Murphy is a botanist at the Illinois Natural History Survey, and his research focuses on botanical surveys and floristic taxonomy.

Matthew Richardson is a Post Doctoral Research Associate in the Department of Crop Sciences at the University of Illinois Urbana-Champaign and conducts research on the mechanisms that influence patterns of biodiversity.

Loy R. Phillippe is a collection manager for the vascular plants and fungi at the Illinois Natural History Survey. His primary duties include herbarium computerization, specimen collection and preparation and the daily operations of the herbarium. Loy earned a B.S. and M. S. in botany from Eastern Illinois University and a Ph.D. in plant taxonomy from the University of Tennessee.

John E. Schwegman is a nature conservationist. He is retired from the Illinois Department of Natural Resources where his career included both natural area preservation and native plant conservation.

Emily Stork is a regional ecologist for the Illinois Natural Areas Inventory Update. She is responsible for identifying, mapping, and describing the remaining areas of high natural quality within her region in south-central Illinois.

Gordon C. Tucker is a professor in Biological Sciences at Eastern Illinois University. He teaches courses in plant taxonomy, dendrology, wetland plants, and ethnobotany. His research interests include sedges of North America, China, and South America.

Erigenia, Number 23, Winter 2010, pp 3–23

Vascular Plant Species Extirpated or not Vouchered as Occurring in Illinois

John E. Ebinger[1], Loy R. Phillippe[1], Michael J. C. Murphy[1], Gordon C. Tucker[2], and Paul Marcum[1]

Abstract: We searched for records of 310 native Illinois vascular plant taxa that we considered very uncommon, rare, or possibly extirpated from the state. Most of the state herbaria and some of the major herbaria from surrounding states were searched. We searched the literature, records in the Illinois Natural Heritage Database, and contacted many local botanists and biologists. Also, authors of the "Flora of North America" were contacted concerning recent records. Of the 117 taxa discussed in this article, 87 are possibly extirpated from Illinois, while for 30 a voucher specimen was either absent or misidentified, or for other reasons not useable. Of the 87 species that are probably extirpated, most have not been seen in the state for more than 50 years, and some have not been seen since the mid 1800's. The species that lack a voucher specimen for Illinois are mostly based on misidentification, the perpetuation of earlier mistakes, listed species for which there is insufficient or misinterpreted data, the voucher was a cultivated plant, or the names used are now considered synonyms of common species. Presumably most of these 30 taxa were never part of the Illinois flora.

Introduction

About 11% of the native vascular plant species found in Illinois are officially listed as state threatened or state endangered. In the latest list, 263 species are considered endangered while 76 taxa are considered threatened (Illinois Endangered Species Protection Board 2005). Populations of many of these species have been observed and their presence reported over the years, particularly populations that are known from state lands, especially dedicated natural preserves. Other species were placed on the list based on historical herbarium records, but living populations were difficult to locate or the species were not known to presently occur in Illinois. Other species were listed based on specimens that we now know represent misidentification, while other species were listed based on the presence of an adventive individual or population (Herkert 1991, 1994, Illinois Endangered Species Protection Board 1989, 1990, 1994, 1999, 2005). Usually species of this last group soon disappear from the flora, or occasionally become aggressive exotics.

In the fall of 2008 the Illinois Endangered Species Protection Board conducted a five-year review of endangered and threatened species. The review includes observation reports, research reports, database queries, and reports by the botanists, biologists, and zoologists mostly from the Illinois Department of Natural Resource (IDNR) and the Illinois Natural History Survey. These data were entered into the Illinois Natural Heritage Database that is maintained by the IDNR, and is used to track sensitive natural resources including endangered and threatened species, Illinois Natural Areas Inventory sites, and Illinois Nature Preserves Commission lands (Kieninger 2009). We used this database to help determine the status of species reported in this article. Nearly all species, however, have few recent herbarium or site records and the quality of the data obtained was usually not sufficient to relocated populations. The early work by Bowles et al. (1991) has been extremely helpful in making many of the decisions made in this report.

Methods

We studied 310 vascular plant taxa native to Illinois for which we tried to determine their present status in the state. For these species we accumulated data and did field work to determine the presence of extant

[1] 1816 South Oak Street, Illinois Natural History Survey, Champaign, Illinois 61820; corresponding author (jeebinger@eiu.edu).
[2] Department of Biological Sciences, Eastern Illinois University, 600 Lincoln Ave., Charleston, IL 61920.

Illinois populations. The present report contains 117 species that we determined extirpated from Illinois, or species for which we have been unable to locate herbarium vouchers. We determined the remaining species are extant in Illinois, and many of these species will be discussed in future publications.

We started by searching many of the herbaria in Illinois and surrounding states for the 310 vascular plant species. In addition, we searched the literature, the records for the species in the Illinois Natural Heritage Database, and contacted many local botanists and biologists. The files compiled by the Illinois Natural Areas Inventory during 1975–1978, and maintained since then by the Illinois Department of Conservation (now IDNR), Natural Heritage Division were examined. Also, many of the authors for the ''Flora of North America'' were contacted concerning recent records. We searched these sources for these 310 vascular plant species and used this information to direct field searches.

Abbreviations for herbaria cited are: CM (Carnegie Museum), DEK (Northern Illinois University), EIU (Eastern Illinois University), F (Field Museum of Natural History, FS (Forest Service Herbarium at Vienna), GH (Gray Herbarium of Harvard University), KNOX (Knox College, contains many of Meads' collections), ILL (University of Illinois Urbana/Champaign), ILLS (Illinois Natural History Survey), ISM (Illinois State Museum), ISU (Illinois State University, MO (Missouri Botanical Garden), MOR (The Morton Arboretum), MWI (Western Illinois University), ND (University of Notre Dame), NLI (Natural Land Institute), NY (New York Botanical Garden), RCK (Rockford College), SIU (Southern Illinois University), US (United States National Herbarium), and WIS (University of Wisconsin).

For the most part, nomenclature used follows Mohlenbrock (2002a). Common synonyms are also listed as is the nomenclature used in the ''Flora of North America.'' The Illinois distribution of most species is based on the maps in Mohlenbrock and Ladd (1978), Jones and Fuller (1955), and Swink and Wilhelm (1994). Endangered and threatened species distribution records, for the most part, follow Herkert and Ebinger (2002).

RESULTS

Of the 117 taxa discussed in this article, 87 taxa are probably extirpated from Illinois while the others are not vouchered for the state the voucher is misidentified, or are synonyms. Of the 87 species that are probably extirpated, most have not been seen in the state for more than 50 years, and some have not been seen since the mid 1800s. The species that lack a voucher specimen from Illinois are mostly based on misidentification, the perpetuation of earlier mistakes, listed species for which there is insufficient or misinterpreted data, or the names are now considered synonyms of more common species. Presumably these 30 taxa were never a part of the native Illinois flora.

For each species discussed below we list recent synonyms and other nomenclatural problems, the counties and herbaria where specimens have been located, the species status (extirpated, or voucher problems), the species general distribution in North America, the author or collector that reported the species for the state, and other data concerning each taxon, particularly information on herbarium specimens found. The decisions concerning the status of all species listed here are based on conclusions we made after reviewing all available material and interviewing knowledgeable botanists. Anyone with additional information on the species included in this report should contact the senior author so that we can correct our mistakes.

ACKNOWLEDGMENTS

The authors thank the Illinois Department of Natural Resources, the Illinois Nature Preserves Commission, the Illinois Endangered Species Protection Board, and the Illinois Department of Transportation for the use of their data bases and for financial support to complete this project. Many amateur and professional plant taxonomists and other interested individuals are also thanked for their interest and help. The members of the Endangered Species Advisory Committee of the Endangered Species Protection Board were very helpful in obtaining the information needed to complete this manuscript. We also thank the curators of the many herbaria for allowing us to use their facility and for their help in locating and sending requested specimens. Special thanks go to Dr. Robert H. Mohlenbrock for his help with many of the difficult species.

LITERATURE CITED

Allen, C. M. and D. W. Hall. 2003. *Paspalum*. In Flora of North America 25:566–599.

Allred, K. W. 2003. *Aristida*. In Flora of North America 25:315–342.

Ball, P. W. 2002. *Carex* Linnaeus sect. Porocystis. In Flora of North America 23:482–485.

Ball, P. W. and D. E. Wujek. 2002. *Eriophorum*. In Flora of North America 23:21–27.

Barkworth, M. E. 2007a. *Piptatherum*. In Flora of North America 24:144–151.

Barkworth, M. E. 2007b. *Oryzopsis*. In Flora of North America 24:167–168.

Barkworth, M. E. 2007c. *Nassella*. In Flora of North America 24:170–177.

Barkworth, M. E. and L. K. Anderton. 2007. *Glyceria*. In Flora of North America 24:68–88.

Bayer, R. J. 2006. *Antennaria*. In Flora of North America 19:388–415.

Boufford, D. 2008. email dated 10 October 2008.

Boufford, D. 2009. email dated 24 March 2009.

Bowles, M. L., J. B. Taft, E. F. Ulaszek, M. K. Solecki, D. M. Ketzner, L. R. Phillippe, A. Dennis, P. J. Burton, and K. R. Robertson. 1991. Rarely seen endangered plants, rediscoveries, and species new to Illinois. Erigenia 11:27–51.

Bowles, M. L., R. Flakne, K. McEachern, and N. Pavlovic. 1993. Recovery planning and reintroduction of the federally threatened Pitcher's thistle (*Cirsium pitcheri*) in Illinois. Natural Areas Journal 13:164–176.

Brandenburg, D. M. 2007. *Cinna*. In Flora of North America 24:773–774.

Bryson, C. T. and R. F. C. Naczi. 2002. *Carex* Linnaeus sect. Laxiflorae. In Flora of North America 23:431–440.

Case, Jr., F. W. 2002. *Trillium*. In Flora of North America 26:90–117.

Catling, P. M. and L. K. Magrath. 2002. *Malaxis*. In Flora of North America 26:627–632.

Cranfill, R. B. 1993. *Woodwardia*. In Flora of North America 2:226–227.

Crins, W. J. 2002. *Trichophorum*. In Flora of North America 23:28–31.

Crins, W. J. 2007. *Milium*. In Flora of North America 24:778–780.

Crins, W. J. and J. H. Rettig. 2002. *Carex* Linnaeus sect. Acrocytis. In Flora of North America 23:532–545.

Durand, L. T. 2000. Sagittaria. In Flora of North America 22:11–23.

Elisens, W. J. 2009. email dated 24 April 2009.

Evert, E. F. 1980. A range extension for *Dryopteris filix-mas*. American Fern Journal 70:113–114.

Fernald, M. L. 1945. An incomplete flora of Illinois. Rhodora 47:204–219.

Fernald, M. L. 1950. Gray's manual of botany, 8th ed., American Book Company, New York. ixiv + 1632 pp.

Freckmann, R. W. and M. G. Lelong. 2003a. *Dichanthelium*. In Flora of North America 25:406–450.

Freckmann, R. W. and M. G. Lelong. 2003b. *Panicum*. In Flora of North America 25:451–488.

Freudenstein, J. V. 2008. email dated 14 November 2008.

Gleason, H. A. and A. Cronquist. 1991. Manual of the vascular flora of northeastern United States and adjacent Canada. Second Edition. The New York Botanical Garden, Bronx, New York. ixxv + 910 pp.

González-Elizondo, M. S. 2002. *Eleocharis* R. Brown subg. Limnochloa. In Flora of North America 23:116–120.

Grimes, J. W. 1990. A revision of the New World species of Psoraleeae (Leguminosae: Papilionoideae). Memoires of the New York Botanical Garden 61:1–114.

Haines, A. 2006. *Euthamia*. In Flora of North America 20:97–100.

Hauke, R. L. 1993. Equsetaceae. In Flora of North America 2:76–84.

Haynes, R. R. and C. B. Hellquist. 2000. Potamogetonaceae. In Flora of North America 22:47–70.

Herkert, J. R. 1991. editor. Endangered and Threatened Species of Illinois: Status and Distribution, Volume 1 – Plants. Illinois Endangered Species Protection Board, Springfield, Illinois. 158 pp.

Herkert, J. R. 1994. Endangered and Threatened Species of Illinois: Status and Distribution, Volume 3 – 1994. Changes to the Illinois List of Endangered and Threatened Species. Illinois Endangered Species Protection Board, Springfield, Illinois. 33 pp.

Herkert, J. R. 1998. Proposed additions, deletions, and changes to the Illinois list of threatened and endangered plants. 12 pp (unpublished document, Illinois Endangered Species Protection Board).

Herkert, J. R. and J. E. Ebinger. 2002. eds. Endangered and Threatened Species of Illinois: Status and Distribution. Volume 1: Plants. Illinois Endangered Species Protection Board, Springfield, Illinois. 161 pp.

Herkert, J. R. and G. Kruse. 1992. Changes in Illinois' list of endangered and threatened plant species. Erigenia 12:17–21.

Higley, W. K. and C. S. Raddin. 1891. The flora of Cook County, Illinois, and a part of Lake County, Indiana. Bulletin of the Chicago Academy of Science 2:1–168.

Holmes, W. C. 2002. Smilacaceae. In Flora of North America 26:468–478.

Illinois Endangered Species Protection Board. 1989. Checklist of Endangered and Threatened Animals and Plants of Illinois. Illinois Endangered Species Protection Board, Springfield, Illinois. 24 pp.

Illinois Endangered Species Protection Board. 1990. Checklist of Endangered and Threatened Animals and Plants of Illinois. Illinois Endangered Species Protection Board, Springfield, Illinois. 26 pp.

Illinois Endangered Species Protection Board. 1994. Checklist of Endangered and Threatened Animals and Plants of Illinois. Illinois Endangered Species Protection Board, Springfield, Illinois. 20 pp.

Illinois Endangered Species Protection Board. 1999. Checklist of Endangered and Threatened Animals and Plants of Illinois. Illinois Endangered Species Protection Board, Springfield, Illinois. 20 pp.

Illinois Endangered Species Protection Board. 2005. Checklist of Endangered and Threatened Animals and Plants of Illinois. Illinois Endangered Species Protection Board, Springfield, Illinois. 16 pp.
Jones, G. N. and G. D. Fuller. 1955. Vascular Flora of Illinois. Illinois State Museum Scientific Series 6:1–593.
Kaul, R. B. 2002. Sparganiaceae. In Flora of North America 22:270–277.
Kaul, R. B. 2008. email dated 9 October 2008.
Keil, D. J. 2006. *Cirsium*. In Flora of North America 19:95–164.
Kieninger, T. 2009. email dated 1 April 2009.
Kral, R. 2002a. *Fimbristylis*. In Flora of North America 23:120–131.
Kral, R. 2002b. *Fuirena*. In Flora of North America 23:32–37.
Kral, R. 2002c. *Rhynchospora*. In Flora of North America 23:200–239.
Lewis, D. Q. 2002. Burmanniaceae. In Flora of North America 26:486–489.
Magrath, L. K. and J. V. FreudensteIn. 2002. *Corallorhiza*. In Flora of North America 26:633–638.
Mastrogiuseppe, J., P. E. Rothrock, A. C. Dibble, and A. A. Reznicek. 2002. *Carex* Linnaeus sect. Ovales. In Flora of North America 23:332–378.
Mehrhoff, L. A. and M. A. Homoya. 2002. Isotria. In Flora of North America 26:511–513.
Mohlenbrock, R. H. 1970a. The Illustrated Flora of Illinois. flowering rush to rushes. Southern Illinois University Press, Carbondale, Illinois. 272 pp.
Mohlenbrock, R. H. 1970b. The Illustrated Flora of Illinois. lilies to orchids. Southern Illinois University Press, Carbondale, Illinois. 288 pp.
Mohlenbrock, R. H. 1978. The Illustrated Flora of Illinois. hollies to loasas. Southern Illinois University Press, Carbondale, Illinois. 315 pp.
Mohlenbrock, R. H. 1980. The Illustrated Flora of Illinois. willows to mustards. Southern Illinois University Press, Carbondale, Illinois. 286 pp.
Mohlenbrock, R. H. 1982. The Illustrated Flora of Illinois. basswoods to spurges. Southern Illinois University Press, Carbondale, Illinois. 234 pp.
Mohlenbrock, R. H. 1985. Recent developments in *Thismia americana* N.E. Pfeiffer. Erigenia 5:31–39.
Mohlenbrock, R. H. 1990. The Illustrated Flora of Illinois. nightshades to mistletoe. Southern Illinois University Press, Carbondale, Illinois. 224 pp.
Mohlenbrock, R. H. 1999a. The Illustrated Flora of Illinois. Sedge: *Carex*. Southern Illinois University Press, Carbondale, Illinois. 328 pp.
Mohlenbrock, R. H. 1999b. The Illustrated Flora of Illinois. Ferns. 2nd edition. Southern Illinois University Press, Carbondale, Illinois. 240 pp.
Mohlenbrock, R. H. 2001a. The Illustrated Flora of Illinois. cyperus to scleria. 2nd edition. Southern Illinois University Press, Carbondale, Illinois. 223 pp.
Mohlenbrock, R. H. 2001b. The Illustrated Flora of Illinois. Grasses: panicum to danthonia. 2ndedition. Southern Illinois University Press, Carbondale, Illinois. 455 pp.
Mohlenbrock, R. H. 2002a. Vascular Flora of Illinois. Southern Illinois University Press, Carbondale, Illinois. x + 490 pp.
Mohlenbrock, R. H. 2002b. The Illustrated Flora of Illinois. Grasses: bromus to paspalum. 2nd edition. Southern Illinois University Press, Carbondale, Illinois. 404 pp.
Mohlenbrock, R. H. 2009. email dated 4 August 2009.
Mohlenbrock, R. H. and D. M. Ladd. 1978. Distribution of Illinois Vascular Plants. Southern Illinois University Press, Carbondale, Illinois. vii + 282 pp.
Mohlenbrock, R. H. and K. Wilson. 1985. A floristic study of Fountain Bluff, Jackson County, Illinois. Erigenia 6:29–55.
Mohlenbrock, R. H., J. E. Ozment, and G. W. Folkerts. 1962. Additions to the flora of Illinois. Rhodora 64:356–358.
Montgomery, J. D. and W. H. Wagner, Jr. 1993. *Dryopteris*. In Flora of North America 2:280–288.
Moran, R. C. 2008. email dated 30 September 2008.
Morton, J. K. 2005. *Stellaria*. In Flora of North America 5:96–114.
Nelson, J. B. 1981. *Stachys* (Labiatae) in southeastern United States. Sida 9:104–123.
Nesom, G. L. 2006a. *Liatris*. In Flora of North America 21:512–535.
Nesom, G. L. 2006b. *Pseudognaphalium*. In Flora of North America 19:415–425.
Nienaber, M. A. 2000. Scheuchzeriaceae. In Flora of North America 22:41–42.
Nixon, K. C. 1997. Castanea. In Flora of North America 3:439–442.
Nyboer, R. W. and J. E. Ebinger. 2004. editors. Endangered and Threatened Species of Illinois: Status and Distribution, Volume 3: 2004 Changes to the Illinois List of Endangered and Threatened Plant Species. Illinois Endangered Species Protection Board, Springfield, Illinois. 34 pp.
Park, M. M. and D. Festerling, Jr. 1997. *Thalictrum*. In Flora of North America 3:258–271.
Parfitt, B. D. 1997. *Trautvetteria*. In Flora of North America 3:138–139.
Pepoon, H. S. 1927. An annotated flora of the Chicago area. Bulletin of the Chicago Academy of Science 8:1–554.
Phillippe, L. R., S. M. Gelhausen, K. R. Robnertson, and J. E. Ebinger. 2000. Assessment of the reintroduction potential of federally endangered

and threatened species to managed sites in Illinois. Report submitted to the Illinois Department of Natural Resources, Springfield, Illinois.
Rabeler, R. 2007. email dated 20 November 2007.
Reznicek, A. A. and B. A. Ford. 2002. *Carex* Linnaeus sect. Vesicariae. In Flora of North America 23:501–511.
Rothrock, P. E., A. A. Reznicek, and A. L. Hipp. 2009. Taxonomic study of the *Carex tenera* group (Cyperaceae). Systematic Botany 34:297–311.
Schilling, E. E. 2006. *Helianthus*. In Flora of North America 21:141–169.
Schuyler, A. E. 1964. A biosystematic study of the *Scirpus cyperinus* complex. Academy of Natural Sciences of Philadelphia 115:283–311.
Schwegman, J. E. 2007. email dated 21 December 2007.
Sheviak, C. J. 1974. An Introduction to the Ecology of the Illinois Orchidaceae. Illinois State Museum Scientific Papers XIV. Springfield, Illinois. 89 pp.
Sheviak, C. J. 1981. Endangered and Threatened Plants. *In* M. L. Bowles, V. E. Diersing, and J. E. Ebinger, eds., Endangered and Threatened Vertebrate Animals and Vascular Plants of Illinois. Illinois Department of Conservation, Springfield. 70–179.
Sheviak, C. J. 2008. email dated 1 October 2008.
Sheviak, C. J. 2002. *Platanthera*. In Flora of North America 26:551–571.
Sheviak, C. J. and P. M. Brown. 2002. *Spiranthes*. In Flora of North America 26:530–545.
Sheviak, C. J. and P. M. Catlin. 2002. *Arethusa*. In Flora of North America 26:596–597.
Smith, Jr., J. P. 2003. *Gymnopogon*. In Flora of North America 25:231–232.
Smith, S. G. 2002a. *Eleocharis* R. Brown subg. Scirpidium. In Flora of North America 23:107–112.
Smith, S. G. 2002b. *Schoenoplectus*. In Flora of North America 23:44–59.
Soreng, R. J. 2007. Poa. In Flora of North America 24:486–601.
Steyermark, J. A. and F. A. Swink. 1952. Plants new to Illinois and to the Chicago region. Rhodora 54:208–213.
Strong, M. 2008. email dated 1 October 2008.
Strother, J. L. 2006a. *Gaillardia*. In Flora of North America 21:421–426.
Strother, J. L. 2006b. *Lactuca*. In Flora of North America 19:259–263.
Strother, J. L. 2006c. *Veronica*. In Flora of North America 19:206–213.
Swink, F. A. 1988. *Clintonia* – an unusual story. Erigenia 10:27 pp.
Swink, F. and G. Wilhelm. 1994. Plants of the Chicago region, 4th edition. Indianapolis: Indiana Academy of Science.
Trelease, W. 1887. A revision of North American Linaceae. Transactions of the Academy of Science of St.Louis 5:7–20.
Tucker, G. C. 2002. *Lipocarpha*. In Flora of North America 23:195–197.
Urbatsch, L. E. and P. B. Cox. 2006. *Rudbeckia*. In Flora of North America 21:45–60.
Utech, F. H. 2002. *Clintonia*. In Flora of North America 2:18–37.
Wagner, Jr., W. H. and J. M. Beitel. 1993. Lycopodiaceae. In Flora of North America 2:18–37.
Wagner, Jr., W. H., R. C. Moran, and C. R. Werth. 1993. Aspleniaceae. In Flora of North America 2:228–245.
Webster, R. D. 2003. *Saccharum*. In Flora of North America 25:609–616.
Wherry, E. T. 1955. The genus *Phlox*. Morris Arboretum Monographs III:1–174. Morris Arboretum of the University of Pennsylvania, Philadelphia.
White, J. 1978. Illinois Natural Areas Inventory. Technical report. Volume I. Survey methods and results. Illinois Natural Areas Inventory, Urbana. xix + 426 pp.
Whittemore, A. T. 1997. *Berberis*. In Flora of North America 3:276–286.
Whittemore, A. T. and A. E. Schuyler. 2002. *Scirpus*. In Flora of North America 23:8–21.

APPENDIX

FERN AND FERN-ALLIES

ASPLENIACEAE
Asplenium ruta-muraria L. var. *crytolepis* (Fern.) Wherry (wall-rue spleenwort)
Known specimens: southern Illinois (ILL).
Status: Extirpated.

Wall-rue spleenwort is a circumboreal species that occurs in the northeastern United States, adjacent Canada, and south through the Appalachian Mountains. According to Mohlenbrock (2002a), this species has not been seen in Illinois since the middle of the 1800s and is probably extirpated. A fragment of a specimen at ILL is labeled *Asplenium ruta-muraria*, southern Illinois (Brendel Herbarium, purchased 1914). Not recorded for Illinois in the "Flora of North America" (Wagner et al. 1993).

BLECHNACEAE
Woodwardia virginica (L.) Sm. (Virginia chain-fern)
[=*Anchistea virginica* (L.) Presl.]
Known specimens: Lake (ILL, ILLS, ISM, RCK).
Status: Extirpated.

A fern species mostly confined to the coastal plain of eastern North America (Cranfill 1993). According to

Jones and Fuller (1955) and Mohlenbrock (2002a), this taxon was last collected in Illinois in 1944. We found a 1947 specimen from the same locality [bog, 3 miles E of Antioch, 22 June 1947, *R.A. Evers 4577* (ILLS)]. This site has been altered by drainage (Bowles et al. 1991), and this taxon is now extirpated from Illinois (Herkert and Kruse 1992).

DRYOPTERIDACEAE
Dryopteris filix-mas (L.) Schott (male fern)
Known specimens: Cook (SIU).
Status: Extirpated.

A fern native of the Great Lakes region and the Rocky Mountains that grows in dense woods. Male fern was reported by Evert (1980) for Cook County [north-facing ravine slope about 400 feet west of Lake Michigan, Glencoe, 14 Dec 1979, *E. F. Evert s.n.* (SIU)]. Montgomery and Wagner (1993) did not list this species for Illinois in the ''Flora of North America.'' According to Moran (2008) the Cook County collection (*Evert s.n.*) is an adventive or planted specimen, the local residents have long been introducing and cultivating non-native taxa.

EQUISETACEAE
Equisetum palustre L. (marsh horsetail)
Known specimens: Peoria (ILL), Tazewell (F, ILL), Woodford (ILL).
Status: Extirpated.

Confined to extreme northern United States and adjacent Canada the marsh horsetail grows in marshes, swamps, and on stream-banks. Mohlenbrock (2002a) lists this species for Peoria County [no label information except Peoria (ILL)], Tazewell County [Spring Mill Bog, N of East Peoria, 9 Aug 1953, *V. H. Chase 13589* (F, ILL)], and Woodford County [Spring Mills, Jul 1891, *F. E. McDonald s.n.* (ILL)]. Hauke (1993) did not list this taxon for Illinois in the ''Flora of North America.''

LYCOPODIACEAE
Lycopodiella appressa (Chapm.) Cranfill (appressed bog clubmoss)
[=*Lycopodium appressum* (Chapm.) Lloyd & Underw.]
Known specimens: None.
Status: Extirpated. Voucher not located but possibly exists.

This species of club-moss is restricted to the eastern coast of North America and southeastern United States. Mohlenbrock (1999b, 2002a) lists this species for Pulaski County, but no specimens have been found. Wagner and Beitel (1993) listed this taxon for Illinois in the ''Flora of North America.'' Mohlenbrock (2009) thinks this specimen was originally in the SIU herbarium but has been lost.

Lycopodium lagopus (Laes.) Zins. (one-cone clubmoss)
[=*Lycopodium clavatum* L. var. *megastachyon* Fern. & Bissell]
Known specimens: None.
Status: Extirpated. Voucher not located but possibly exists.

This club-moss is found in the northern Great Lakes region of the United States and adjacent southern Canada. Mohlenbrock (1999b, 2002a) lists this species from woodland openings in Will County (4/5 mile W of West River Road, 29 Jul 1976, *K.Wilson & M.Madany s.n.*), but we have been unable to locate this specimen. Wagner and Beitel (1993) did not list this taxon for Illinois in the ''Flora of North America.''

DICOTS

APIACEAE
Daucus pusillus Michx. (small wild carrot)
Known specimens: Perry (ILLS).
Status: Extirpated.

A weedy species of the southern United States that is rarely adventive in Illinois. Mohlenbrock (2002a) reported this species from woods in Perry County and in a cemetery in Jackson County. This species was last collected in Illinois in 1954 (Bowles et al. 1991). We found a Perry County specimen [woods NW of Pinckneyville, 23 Jun 1949, *R. A. Evers 17942* (ILLS)], but none from Jackson County.

AQUIFOLIACEAE
Nemopanthus mucronatus (L.) Trelease (mountain holly)
Known specimens: None.
Status: Not vouchered for Illinois.

A species of the northeastern United States and adjacent Canada that grows in marshes, swamps, and other wet places. This species was listed for Illinois based on a specimen at F (13 Jul 1874, ex coll. *H. H. Babcock s.n.*, Chicago, Ill.). According to Jones and Fuller (1955), this specimen was probably collected in Indiana. There are many collections at F from northwestern Indiana, particularly from a slough border near Miller, Indiana. It is doubtful that this species has ever been found growing wild in Illinois.

ARALIACEAE
Aralia hispida Vent. (bristly sarsaparilla)
Known specimens: Cook (ILL), Lake (ILL).
Status: Extirpated.

Bristly sarsaparilla is a species of northeastern United States and adjacent Canada that grows in sandy, dry woods. Jones and Fuller (1955) and Mohlenbrock (2002a) reported this taxon from sandy soil in Cook and Lake counties. We located specimens from both Cook County [along railroad, Lansing, 13

Jun 1898, *V.H. Chase 855* (ILL)] and Lake County [Volo Bog, 3 June 1942, *G.N. Jones 15170* (ILL)]. According to Bowles et al. (1991) and Herkert and Kruse (1992), this species is now extirpated.

ASTERACEAE

Antennaria solitaria Rydb. (one-headed pussy-toes)
Known specimens: None.
Status: Extirpated. Voucher not located but possibly exists.

A species of eastern United States restricted to rich, deciduous forests and forest openings (Bayer 2006). Mohlenbrock (2002a) reported this taxon from Hardin County. Mohlenbrock (2009) found this species in Lamb Hollow, Hardin Co., but no specimen is presently available. Bayer (2006) did not report this species for Illinois in the ''Flora of North America.''

Cirsium pitcheri (Torr.) Torr. & A. Gray (dune thistle, Pitcher's thistle)
Known specimens: Cook (F, ILL, ILLS, ISM, ISU, MO), Lake (F, ILL).
Status: Extirpated. **(State Threatened)**

Dune thistle is endemic to beach and dune habitats around Lake Huron, Lake Michigan, and Lake Superior (Keil 2006). Jones and Fuller (1955) and Mohlenbrock (2002a) reported this taxon from Cook and Lake counties and numerous specimens are at F and ILL. Presently, no populations are known to survive though attempts have been made to re-establish this species in Illinois (Bowles et al. 1993). *Cirsium pitcheri* is presently listed as threatened in Illinois (Herkert and Ebinger 2002).

Euthamia remota Greene (lake grass-leaved goldenrod) [=*Euthamia tenuifolia* (Pursh) Greene; *Euthamia caroliniana* (L.) Greene; *Solidago remota* (Greene) Fries.]
Known specimens: Cook (ND), Christian (ND).
Status: Extirpated.

This taxon, which is found on open, moist to wet, sandy soil of shores and dunes in eastern United States, should be listed as *Euthamia caroliniana*. Mohlenbrock (2002a) reported this taxon for Cook County, while Bowles et al. (1991) found no Illinois specimen. We located two specimens: Cook County [fields, Berwyn, Sep 1907, *W. W. Calkins s.n.* (ND)] and Christian Co. [damp woods, Pana, Sep 1928, *Sr. M.Clotilda s.n.* (ND)]. Haines (2006) listed this species for Illinois in the ''Flora of North America.''

Gaillardia aestivalis (Walt.) Rock var. *flavovirens* (Mohr) Cronq. (Gaillardia)
Known specimens: Alexander (US).
Status: Extirpated.

A species of open grasslands, this taxon is known from the southeastern United States and adjacent Mexico (Strother 2006a). According to Mohlenbrock (2002a) this taxon was known from prairies in Alexander County, but has not been seen in Illinois since 1874. Strother (2006a) did not list this species for Illinois in the ''Flora of North America.'' Mohlenbrock (2009) is not sure this species is native to Illinois, but located the specimen at US.

Helianthus silphioides Nutt. (Silphium sunflower, rosinweed sunflower)
Known specimens: Alexander (NY), St. Clair (ILLS, ISM, MO, SIU).
Status: Extirpated.

Silphium sunflower grows in open areas in the Ozark region of south-central United States (Schilling 2006). Mohlenbrock (2002a) reported this species from Alexander and St. Clair counties. The single specimen from Alexander County is at NY (1874, *O. Kuntze s.n.*) (Jones and Fuller 1955). This species has not been collected in Illinois since 1961 [St Clair Co., vicinity of Millstadt, 2 Sep 1961, *J. O. Neill 15783* (ISM, SIU)] and is presumed extirpated.

Lactuca ludoviciana (Nutt.) DC. (western wild lettuce, prairie lettuce)
Known specimens: Boone (ISM), Carroll (ILLS), Cook (ILL, ISM, MO), Hancock (KNOX), Lake (ILLS), Macon (ILL), McHenry (ISM), Peoria (ILL), Stark (F, ILL, ILLS).
Status: Extirpated.

Western wild lettuce is a common prairie species that occurs throughout much of the central and western United States and adjacent Canada (Strother 2006b). Numerous Illinois specimens of this species have been located but we have found none collected later than 1954. The relatively large number of early collections indicates that this taxon may still exist in the state, but repeated efforts to located populations have been unsuccessful (Bowles et al. 1991).

Liatris punctata Hook. var. *nebraskana* Gaiser (dotted blazing-star, plains gayfeather)
Known specimens: Du Page (?).
Status: Extirpated. Voucher not located but possibly exists.

Dotted blazing-star is a common species of the prairies and plains of central United States and adjacent Canada (Nesom 2006a). Mohlenbrock (2002a) reported this species as possibly adventive in Du Page County, while Jones and Fuller (1955) cited a specimen (Du Page Co., along railway, Lisle, 8 Jul 1925, *A. J. Prisc 26*). Nesom (2006a) listed this species for Illinois in the ''Flora of North America.'' If dotted

blazing-star was originally found in Illinois it is undoubtedly extirpated.

Pseudognaphalium macounii (Greene) Kartesz (Macoun's rabbit-tobacco)
[=*Pseudognaphalium viscosum* sensu Mohlenbrock (2002a)]
Known specimens: Clark (ILLS).
Status: Extirpated.

Macoun's rabbit-tobacco, a species of the northeastern and western North America, grows in dry, open habitats, pastures and open woods (Nesom 2006b). Mohlenbrock (2002a) reported this rare species from Clark County [Rocky Branch, 1932, *H. S. Pepoon s.n.*(ILLS)]. Herkert and Kruse (1992) considered this taxon extirpated from Illinois. Nesom (2006b) reported this taxon for Illinois in the ''Flora of North America.''

Rudbeckia bicolor Nutt. (Annual black-eyed Susan)
Known specimens: None.
Status: Synonym of *Rudbeckia hirta* L. var. *pulcherima* Farwell.

According to Mohlenbrock (2002a), *Rudbeckia bicolor* is a rare species of moist thickets found in Jackson and Union counties. Urbatsch and Cox (2006) in the ''Flora of North America'', lists this name as a synonym of the very common *Rudbeckia hirta* L. var. *pulcherrima* Farwell.

Vernonia arkansana DC. (Ozark ironweed)
[=*Vernonia crinata* Raf.]
Known specimens: Champaign (EIU, ILL, ISM).
Status: Extirpated.

This species is mostly restricted to the Ozark region where it grows in open fields, pastures, and roadsides (Strother 2006c). Mohlenbrock (2002a) listed this species for Champaign County where it was last collected in Illinois in 1958 [roadside, about ½ mile S of Champaign Airport, 30 Sep 1958, *G. S. Winterringer 14851* (ISM)]. Now extirpated from the state, this species is probably being planted in prairie restorations.

BERBERIDACEAE
Berberis canadensis Mill. (American barberry)
Known specimens: Tazewell (F, ILL, MO).
Status: Extirpated. **(State Endangered)**

A species of dry woodlands and bluffs that is native to the Appalachian Mountains and disjunct to the west into Illinois and Missouri (Whittemore 1997). Mohlenbrock (2002a) reported this species from Jackson and Tazewell counties. It was last collected in Tazewell County in 1924 [bluff adjacent to Spring Lake, 29 Oct 1924, *J. A. Twardock s.n.* (F, MO)], and not seen at that locality since 1987 (Herkert and Ebinger 2002). Mohlenbrock and Wilson (1985) found this species at Fountain Bluff, Jackson County, but did not list a specimen. This taxon is probably extirpated.

BRASSICACEAE
Arabis drummondii A. Gray (Drummond's rock cress)
Known specimens: None.
Status: Voucher misidentified.

This species of rock cress is native to the northeastern United States and adjacent Canada. Mohlenbrock (2002a) reported this species from gravelly soil in Cook and Kane counties. We have been unable to locate an Illinois specimen. The listing of Drummond's rock cress for Illinois is probably based on misidentified specimens.

Rorippa tenerrima Greene (slender yellow cress)
[=*Rorippa truncata* (Jepson) Stuckey]
Known specimens: St. Clair (MO).
Status: Extirpated.

A species of wet, disturbed habitats widely scattered in Mexico, western United States, and adjacent Canada. Mohlenbrock (1980, 2002a) listed it from along rivers in Jackson and St. Clair counties and later from Cass County (Mohlenbrock and Ladd 1978). The St. Clair County specimen [Mississippi River, 5 Jun 1874, *H. Eggert s.n.* (MO)] was annotated by R. L. Stuckey, 1965. According to Bowles et al. (1991), this species was last collected in Jackson County in 1976, but we found no specimens. This taxon is adventive, and probably extirpated from Illinois (Herkert and Kruse 1992).

CAPRIFOLIACEAE
Linnaea borealis L. var. *longiflora* Torr. (twin-flower)
Known specimens: Cook (?).
Status: Extirpated. Voucher not located but possibly exists.

A circumpolar species of moist to dry woods and cold bogs in northern United States and adjacent Canada. According to Jones and Fuller (1955), this species is extirpated from Illinois, having been reported only once (Cook Co., Winnetka, *G. Vasey s.n.*). We have been unable to locate an Illinois specimen, but if twin-flower was originally present in Illinois it is now extirpated.

CARYOPHYLLACEAE
Stellaria crassifolia Ehrh. (matted chickweed)
Known specimens: McHenry (F, ILL, MO).
Status: Extirpated.

This circumboreal species is common throughout most of north-central United States and Canada (Morton 2005). Mohlenbrock (2002a) lists the matted chickweed for McHenry County based on a specimen from the 1800s [McHenry Co., Ringwood, Ill., *G.*

Vasey s.n. (F, ILL, MO)]. Rabeler (2007) considers the specimen *S. crassifolia*. Morton (2005) listed this species for Illinois in the ''Flora of North America.''

ELATINACEAE
Elatine triandra Schk. (waterwort)
[=*Elatine brachysperma* A. Gray]
Known specimens: Menard (ISM), Sangamon (F).
Status: Extirpated.

A species of shallow water and muddy shores, this taxon is rarely found through most of northern United States, probably due to its habitat and small size. Jones and Fuller (1955) reported waterwort from Menard County [Athens, Jul 1860, *E. Hall 12391* (ISM)] and Sangamon County [Springfield, 1861, *M.S. Bebb s.n.* (F)]. According to Mohlenbrock (1978), this taxon has not been seen in Illinois in over 100 years.

ERICACEAE
Epigaea repens L. (trailing arbutus)
Known specimens: Illinois (ILL).
Status: Extirpated.

A species of sandy to peaty woods and clearings that is native to the eastern United States and adjacent Canada. Mohlenbrock (2002a) listed this taxon for northern Illinois as not having been seen since the 1800s. Jones and Fuller (1955) listed the following specimen [''Illinois,'' without locality, *G. Vasey s.n.* (ILL)]. Trailing arbutus was transplanted into White Pine State Park [Ogle Co. transplanted in park, 6 Apr 1943, *A. E. Hill 3624-0* (ISM)].

EUPHORBIACEAE
Euphorbia spathulata Lam. (prairie spurge)
Known specimens: Monroe (ILLS, SIU).
Status: Extirpated. **(State Endangered)**

This Illinois endangered species usually grows on dry prairies, barrens, and rocky hills in the prairies and plains west of the Mississippi River. Mohlenbrock (1982, 2002a) reported this taxon from Monroe County [hill prairie S of Fults, 16 Jun 1950, *R. A. Evers 24160* (ILLS); limestone bluff, 1 mile S of Fults, 25 May 1962, *J. Ozment s.n.* (SIU)]. A single individual of prairie spurge was found at that locality in 1987 (Bowles et al. 1991), and the species is presumed extirpated.

FABACEAE
Apios priceana Robins. (Price's groundnut)
Known specimens: Union (ILL, ILLS, ISM).
Status: Extirpated.

Price's groundnut is a species of low woods native to Kentucky, Tennessee, and southern Illinois. According to Bowles et al. (1991) and Mohlenbrock (2002a) this species was last collected in 1941 from Union County [Wolf Lake, 8 Jul 1941, *G. D. Fuller & R. Fisher 664* (ILL, ILLS, ISM)]. Repeated attempts to locate this species in southern Illinois have failed and it is presumed extirpated from the state.

Lathyrus maritimus (L.) Bigel. (beach pea)
[=*Lathyrus japonicus* Willd. var. *maritimus* (L.) Kartesz & Gsandhi]
Known specimens: Cook (F, ILL, ILLS, ISM, ISU, MO, SIU), Lake (F, ILL, ISM, MO).
Status: Extirpated. **(State Endangered)**

A sandy shoreline species, the beach pea is found along the Atlantic coast and inland to the Great Lakes. It was known from the shore of Lake Michigan in Lake and Cook counties (Jones and Fuller 1955, Mohlenbrock 2002a). Formerly common, this taxon has not been collected in Illinois since 1968 [Illinois Beech State Park, 1 Aug 1968, *G. S. Winterringer 24100* (ISM)], and has not been seen since 1977 (Bowles et al. 1991). Erosion from high lake levels has severely affected the habitat of beach pea.

Orbexilum simplex (Nutt.) Rydb. (large-flowered psoralea)
[=*Psoralea simplex* Nutt.]
Known specimens: Clinton (GH).
Status: Extirpated.

A species of the southeastern United State, the large-flowered psoralea is infrequency encountered in sandy soils of open woods and prairies. This species was collected in Illinois by Samuel B. Buckley near Carlyle, Clinton County in the 1800s (GH) (Grimes 1990).

FAGACEAE
Castanea dentata (Marsh.) Borkh. (American chestnut)
Known specimens: Massac (ILLS), Pulaski (F, ILLS), Union (ILLS).
Status: Extirpated.

A large forest tree that in the 1930's was one of the most important forest trees of the eastern United States (Nixon 1997). Since that time the American chestnut has been nearly eliminated by the chestnut blight fungus. In Illinois, this species was originally found in rich woods in the southern tip of the state (Jones and Fuller 1955, Mohlenbrock 2002a). Natural stands of this species were probably in Massac, Pulaski, and Union counties. Presently no native individuals are known to exist in Illinois.

HIPPOCASTANACEAE
Aesculus flava Soland (sweet buckeye, yellow buckeye)
[=*Aesculus octandra* Marsh.]
Known specimens: None.
Status: Not vouchered for Illinois.

A species of moist, rich woods, sweet buckeye is a common forest tree throughout much of the southeastern United States. Mohlenbrock (2002a) reported

this species from rich woods in Gallatin County. We have been unable to locate an Illinois specimen. Mohlenbrock (2009) mentions a specimen from ISM that we could not locate.

HYPERICACEAE

Ascyrum hypericoides L. (St. Andrew's cross)
[=*Hypericum hypericoides* (L.) Crantz]
Known specimens: Hancock (MO).
Status: Extirpated.

A species of dry, sandy or rocky soil in open woods, St. Andrew's cross occurs in the southeastern United States and Mexico. This taxon is known from a single Hancock County collection [Augusta, Jul 1842, *S.B. Mead s.n.* (MO)] and is presumed extirpated.

Hypericum boreale (Britt.) Bickn. (northern St. John's-wort)
Known specimens: None.
Status: Voucher misidentified.

A species of wet, sandy, and mucky soils, this taxon is relatively common in the northeastern United States and adjacent Canada. Reported from Cook and Iroquois counties by Mohlenbrock (2002a), this taxon is not a member of the Illinois flora. Both reports are based on misidentifications of the common *Hypericum mutilum* (Bowles et al. 1991, Herkert and Kruse 1992).

Triadenum virginicum (L.) Raf. (Marsh St. John's-wort)
[=*Hypericum virginicum* L.]
Known specimens: Cook (MO), Lake (SIU).
Status: Extirpated. **(State Endangered)**

This taxon is restricted to bogs, marshes, and wet shores in the eastern United States and adjacent Canada. Only two collections of this species have been located from Cook County [Chicago, Jul 1870, *H.H. Babcock s.n.* (MO)], and Lake County [Illinois Beach State Park, 3 Aug 1972, *R.H. Mohlenbrock s.n.* (SIU)]. Attempts to locate the Lake County site have been unsuccessful (Bowles et al. 1991).

LAMIACEAE

Agastache foeniculum (Pursh) Ktze. (blue giant hyssop)
Known specimens: None.
Status: Voucher a cultivated plant.

A species of dry upland woods and prairie, giant blue hyssop occurs throughout much of the northwestern United States and adjacent Canada. Jones and Fuller (1955) doubted this species occurred in Illinois, while Mohlenbrock (2002a) reported it for Menard County. This report is probably based on an early collection of a cultivated plant [Athens, 1863, *E. Hall s.n.* (MO)]. On the label of this specimen is the statement: this specimen comes from seed collected in the western United States and is an ornamental.

Lycopus amplectens Raf. (bugleweed)
Known specimens: None.
Status: Voucher misidentified.

This bugleweed grows on the coastal plain of the eastern United States from Massachusetts to Florida, and in the mountains of North Carolina. Mohlenbrock (2002a) listed this species for Mason County. According to Herkert and Kruse (1992), this species does not occur in Illinois, the report being based on a misidentification. We cannot verify the presence of this species in Illinois.

Pycnanthemum albescens Torr. & Gray (white mountain mint)
Known specimens: Union (MO, SIU).
Status: Extirpated. **(State Endangered)**

White mountain mint grows in dry upland woods and barrens in southeastern United States. Known in Illinois from Union County where this state endangered species has been collected three times [25 Sep 1879, *G. H. French s.n.* (SIU); 1.5 miles SE of Lick Creek, 7 Oct 1939, *E. Anderson & W. Bauer s.n.* (MO); cherty slope between Old Trail Point and Government Rock, Pine Hills, 14 Jul 1973, *R. H. Mohlenbrock s.n.* (SIU)]. These specimens were annotated by J. J. Hamer, 1990. Attempts to locate populations of this species in the Pine Hills region have been unsuccessful (Bowles et al. 1991).

Pycnanthemum loomisii Nutt. (Loomis' mountain mint)
Known specimens: Alexander (MO), Gallatin (MO), Pulaski (MO).
Status: Extirpated.

A species of southeastern United States, Loomis' mountain mint grows in dry, open, rocky woods and glades. Mohlenbrock (2002a) reported this species from Union County, but we have been unable to locate a specimen. We have specimens from Alexander County [Santa Fe Hills S of Thebes, 11 Sep 1952, *W. M. Bailey & S. R. Swayne 2959* (MO)], Gallatin County [rocky woods, 23 Sep 1919, *E.J. Palmer 16547* (MO)], and Pulaski County [open, rocky woods, Equality, 17 Oct 1919, *E. J. Palmer 17055* (MO)]. These specimens were collected prior to 1953, and all were annotated as *Pycnanthemum loomsii* by J. J. Hamer, 1990.

Pycnanthemum muticum (Michx.) Pers. (mountain mint)
Known specimens: None.
Status: Voucher misidentified.

A species of moist woods and wet meadows, this mountain mint occurs in eastern United States extending west to Missouri and Michigan. Mohlenbrock (2002a) reported this species for Henderson and

Wabash counties. We have been unable to locate any specimens of this species for Illinois. According to Jones and Fuller (1955), this taxon was erroneously attributed to Illinois.

Pycnanthemum torrei Benth. (Torrey's mountain mint)
Known specimens: None.
Status: Extirpated. Voucher not located and probably never existed.

This taxon is found throughout most of the eastern United States where it occurs in dry upland woods and dry forest openings. Mohlenbrock (2002a) reported this species from Alexander, Jackson, and Pope counties. We have been unable to locate any specimens of this species from Illinois. This taxon was listed as state endangered until it was considered extirpated from Illinois (Nyboer and Ebinger 2004).

Stachys clingmanii Small (Clingman's hedge nettle)
Known specimens: None.
Status: Voucher misidentified.

This species of hedge nettle is found in moist woods at higher elevation in the mountains of southeastern United States. Jones and Fuller (1955) and later Mohlenbrock (2002a) reported this species from rocky woods in Alexander, Hardin, Massac, and Pulaski counties. According to Bowles et al. (1991) and Herkert and Kruse (1992), all Illinois specimens ascribed to this species were misidentified. Nelson (1981) considered this species to be restricted to the Blue Ridge Mountains.

Stachys cordata Riddell (heart-leaved hedge nettle)
[=*Stachys nuttallii* Shuttlw., *Stachys riddellii* House]
Known specimens: Tazewell (F).
Status: Extirpated.

A species of wooded bottomlands, rich thickets, and shaded low ground, this species of hedge nettle is found mostly in the mountains in southeastern United States (Fernald 1950). Mohlenbrock (2002a) reported this taxon was from rich woods in Hardin County that we have been unable to locate. There is a specimen at F (Tazewell Co., *F.E. McDonald s.n.*) labeled *Stachys cordata* and annotated as *Stachys nuttalii* by J.B. Nelson,1993. This species is probably extirpated from Illinois.

LINACEAE
Linum floridanum (Planch.) Trel. (coastal plain yellow flax)
Known specimens: Illinois (GH).
Status: Extirpated.

A species found in moist to dry woods and pine-barrens on the coastal plains of the southeastern United States and in the Mississippi River embayment. Mohlenbrock (2002a) reported this species from damp woods in Union County. It was listed for Illinois by Trelease (1887) [''I also refer here a large-fruited plant labeled from Illinois in Hb. Gray, without date or name of collector''] (Fernald 1945). Mohlenbrock (2009) found this species near McCann Springs in the LaRue-Pine Hills of Union Co. but the specimen, originally in the SIU herbarium, has been lost.

ONAGRACEAE
Gaura filipes Spach. (slender gaura, threadstalk gaura)
Known specimens: Hardin (ILL).
Status: Extirpated.

A species of dry, open woods in the southeastern United States, Mohlenbrock (2002a) reported slender gaura from a xeric woods in Hardin County. We found one specimen [Hardin Co., dry hills, Saline Creek, Cave-in-Rock, 12 Jul 1916, *W. Trelease s.n.* (ILL)]. It is very likely this species is extirpated from Illinois.

Oenothera macrocarpa Nutt. (Missouri evening primrose)
[=*Oenothera missouriensis* Sims]
Known specimens: None.
Status: Voucher a cultivated plant.

Native to the midwestern United States from Missouri to Texas and west to Colorado (Fernald 1950). Mohlenbrock (2002a) listed this species from St. Clair County. We have found specimens from Menard County [grown from seed, Athens, 1860, *E. Hall s.n.* (ILL)] and from St. Clair County (East St. Louis, 1895, *A. I. Mulford 1722* (ILL)]. Both specimens probably represent cultivated plants and without better evidence, we suggest that this species has never been known from the wild in Illinois.

PHILADELPHACEAE
Philadelphus verrucosus Schrad. (native mock orange)
[=*Philadelphus pubescens* Loisel.]
Known specimens: Pope (EIU, MO, MOR).
Status: Extirpated.

Native mock orange is restricted to limestone river bluffs of the Mississippi embayment and south-central United States. All specimens found are from near Golconda in Pope County. Most of the specimens were collected before 1924 by E.J. Palmer [*15438* (MO, MOR), *19581* (MO), *22582* (MO, MOR), *23773* (MO)]. The most recent collection was in 1967 [rocky bluffs, Ohio River, near Golconda, *W. C. Whiteside s.n.* (EIU)]. Herkert and Kruse (1992) considered this shrub extirpated from Illinois.

PLANTAGINACEAE
Plantago heterophylla Nutt. (small plantain)
Known specimens: Pulaski (ILLS), Union (CM).
Status: Extirpated.

A species of the southeastern United States, small plantain is a weed Mohlenbrock (2002a) reported from Pulaski and Union counties. In Pulaski County the species was growing in corn stubble [N of America, 14 May 1958, *R. A. Evers 56248* (ILLS)], while the Union County specimen was reported by Jones and Fuller (1955) [Anna, 24 May 1923, *H. C. Benke 3959* (CM)]. This taxon is adventive, and is now extirpated from the state (Bowles et al. 1991, Herkert and Kruse 1992).

POLEMONIACEAE

Phlox carolina L. subsp. *angusta* Wherry (Carolina phlox)

Known specimens: None.

Status: Extirpated.

A species of southeastern United States, the Carolina phlox has been reported from Macoupin County by Mohlenbrock (2002a) and Jefferson County by Wherry (1955). We have examined the Macoupin County specimen [15 Jun 1956, NW of Stauton, *G. S. Winterringer 13446* (ISM)], that was annotated by D. A. Levin, 1963. We feel it is a specimen of *Phlox glaberrima* L. (Mohlenbrock 1990). Wherry (1955) listed the Jefferson County locality as 8 miles west of Mt. Vernon but did not cite a specimen. We have not located a specimen or found the location. According to Bowles et al. (1991) habitat at the collecting site was disturbed and is now unsuitable. Herkert and Kruse (1992) considered this taxon extirpated from the state.

POLYGALACEAE

Polygala pauciflora Willd. (flowering wintergreen)

Know specimens: Cook (F).

Status: Extirpated.

A species of rich woods that is native to the northeastern United States and adjacent Canada. Mohlenbrock (2002a) listed this species from Cook County. Jones and Fuller (1955) listed three Cook County specimens (Thornton, *E. J. Hill s.n.*; *G. Vasey s.n.*; *W. S. Moffatt 1079*) while we located another [Edgebrook, Cook County, Ill., 1908, *C. W. Duesner s.n.* (F)]. Some of these specimens may not represent Illinois material.

POLYGONACEAE

Rumex hastatulus Baldw. (wild sour dock)

Known specimens: Madison (F, ILL), Pike (ILL), St. Clair (F, ILL, ISM, MO).

Status: Extirpated.

A species of open sandy soil that grows on the coastal plain from Massachusetts to Texas and in the Mississippi River embayment north to Illinois. Mohlenbrock (2002a) listed this taxon from Madison County [East Alton, Aug 1896, *F. E. McDonald s.n.* (F, ILL)] and St. Clair County [French Village, 15 Jun 1876, *H. Eggert s.n.* (F); vicinity of Cahokia power plant, 26 Jun 1960, *J. O. Neill 15268* (ISM)], while we found a specimen from Pike County [4 miles E of Troy, 30 Apr 1965, *A. C. Koelling 2299* (ILL)]. This species is probably extirpated from Illinois (Bowles et al. 1991).

PRIMULACEAE

Lysimachia fraseri Duby (Fraser's loosestrife)

Known specimens: Pope (EIU, ISM, SIU).

Status: Extirpated.

A species of stream banks and lowland open woods, Fraser's loosestrife is an uncommon species of the southeastern United States. This taxon was reported from Lusk Creek in Pope County [stream side, S of Indian Kitchen, 3 Jun 1966, *W. E. Hopkins 280* (SIU)]. J. E. Schwegman visited this site in 2003, and was unable to find any individuals of this species. This taxon was listed as state endangered until it was considered extirpated from Illinois (Nyboer and Ebinger 2004).

PYROLACEAE

Pyrola americana Sweet (wild lily-of-the-valley, rounded shinleaf)

[=*Pyrola rotundifolia* L. var. *americana* (Sweet) Fern.]

Known specimens: Ogle (ISM, NLI).

Status: Extirpated.

A circumboreal species that is known from dry to moist woods throughout most of Canada and south into northeastern United States. Reported from Ogle County (Jones and Fuller 1955), this species has only been collected twice in the state, both probably from the same locality [Ogle County, 3 miles NW of Oregon, 7 Apr 1946, *G. D. Fuller 12102* (ISM)]. This taxon is probably extirpated from Illinois (Bowles et al. 1991).

RANUNCULACEAE

Thalictrum pubescens Pursh (Appalachian meadow rue)

Known specimens: None.

Status: Extirpated. Voucher not located but possibly exists.

A species of wet woods, wet meadows, and streambanks, the Appalachian meadow rue is native to eastern United States and adjacent Canada (Park and Festerling 1997). Mohlenbrock (2002a) reported this species as very rare in southeastern Illinois. Though known from Indiana, we can find no record or specimen of this species in Illinois. Park and Festerling (1997) list this species for Illinois in the ''Flora of North America.''

Trautvetteria caroliniensis (Walt.)Vail (false bugbane)

Known specimens: Cass (KNOX, MO).

Status: Extirpated.

A species native to the southern Appalachian Mountains and the Pacific northwest, false bugbane

is a species of variable habitat, being reported from mountain woods in the Appalachians, wet prairies in Indiana and Illinois, and on limestone bluffs in southern Missouri (Parfitt 1997). According to Jones and Fuller (1955), this species was collected only once in Illinois [Cass Co., margin of swamp, Beardstown, Ill., Jul 1842, *C. A. Geyer s.n.* (KNOX, MO)], and is now extirpated.

ROSACEAE
Geum rivale L. (purple avens)
Known specimens: Kane (F, ILL, ISM, MOR), McHenry (ILL), Winnebago (ILL).
Status: Extirpated.

A species of swamps and wet meadows, purple avens is native to northeastern United States and much of Canada. Jones and Fuller (1955) listed this species for Kane County [swamp, Elgin, *G. Vasey 2173* (ISU)], and McHenry County [*Miss Holmes s.n.* (ILL)]. Steyermark and Swink (1952) discovered this taxon in Kane County [Elgin Botanical Garden, 22 May 1948, *F. A. Swink s.n.* (MOR)]. Purple avens is no longer present at this site and is considered extirpated from Illinois (Bowles et al. 1991, Herkert and Kruse 1992).

Porteranthus trifoliatus (L.) Britt. (three-leaved Indian physic)
[=*Gillenia trifoliata* (L.) Moench.]
Known specimens: None.
Status: Not vouchered for Illinois.

A species of dry to moist upland woods, this taxon is mostly found in the mountains of eastern United States and adjacent Canada. Mohlenbrock (2002a) listed this species for Wabash County. We have been unable to locate an Illinois specimen as all examined have the large leaf-like stipules of *P. stipulatus* (Muhl.) Britt.

Potentilla millegrana Engelm. (brook cinquefoil)
[=*Potentilla rivalis* Nutt. var. *millegrana* (Engelm.) S. Wats.]
Known specimens: Adams (ILLS), St. Clair (MEAD), Union (ILLS).
Status: Extirpated. **(State Endangered)**

Native to the Great Lakes region and west to British Columbia, California, and New Mexico, Mohlenbrock (2002a) reported this taxon for Johnson, St. Clair, and Union counties. We have seen specimens for St. Clair County [stockyard field, 14 Jun 1877, *H. Eggert s.n.* (KNOX)], Union County [shore of Mississippi River, 3 miles SW of Wolf Lake, 20 Oct 1971, R. A. Evers 107329 (ILLS)], and recently Adams County [railroad, N of Quincy, 14 Jun 1942, *R. Brinker 1957* (ILLS)].

Sibbaldiopsis tridentata (Ait.) Rydb. (three-toothed cinquefoil)
[=*Potentilla tridentata* Ait.]
Known specimens: None.
Status. Not vouchered for Illinois.

Mostly a northern species of rocky and gravelly shores, this taxon is native to the northeastern United States and south in the Appalachian Mountains to Georgia. Mohlenbrock (2002a) listed this species based on Pepoon (1927) [gravel ridge near Vincennes Ave. at 79th St., a few plants in 1895]. Jones and Fuller (1955) consider the listing by Pepoon (1927) an error. No specimens have been located.

Sorbus decora (Sarg.) C.K. Schneider (showy mountain ash)
[=*Pyrus decora* (Sarg.) Hyland]
Known specimens: Lake (ILLS).
Status: Extirpated.

A small tree of moist to dry woods, this mountain ash species is native to the northeastern United States and adjacent Canada. Mohlenbrock (2002a) reported this species from cool woods in Cook County. We have been unable to locate a Cook County specimen, but did find a Lake County specimen that appears to be this species [bog, 3 miles E of Antioch, 22 Jun 1947, *R. A.* Evers 4582 (ILLS)].

Waldsteinia fragarioides (Michx.) Tratt. (barren strawberry)
Known specimens: Pope (ILLS, SIU).
Status: Extirpated.

Barren strawberry is native to eastern Canada, northeastern United States, and south in the Appalachian Mountains to Georgia. It is known only from Pope County [moist sandstone ledge above Hayes Creek, about 1 mile SW of Eddyville, 24 Apr 1968, *R.H. Mohlenbrock & J.E. Schwegman 1579* (SIU)]. John E. Schwegman could not locate the population in 2004. This taxon was listed as state endangered until considered extirpated from Illinois (Nyboer and Ebinger 2004).

SCROPHULARIACEAE
Gratiola aurea Pursh (goldenwort)
Known specimens: Cook (?).
Status: Extirpated. Voucher not located but possibly exists.

A species of mostly acid soil of muddy and sandy shores, the goldenwort is found in eastern United States and adjacent Canada. Jones and Fuller (1955) recorded this species from Cook County (Forest Park, *A. B. Seymour s.n.*). We have been unable to locate this specimen.

Mecardonia acuminata (Walt.) Small (purple Mecardonia)
Known specimens: Wabash (ILLS)

Status: Extirpated.

A species of moist woods and wet ditches that is native to the southeastern United States from Delaware and Missouri south to Florida and Texas. Jones and Fuller (1955) and Mohlenbrock (2002a) reported this species from Wabash County [roadside ditch, S of Keensburg, 28 Jul 1951, *H.E. Ahles 4650* (ILLS)]. This adventive species has not been collected in Illinois since 1965 when it was reported from the original Illinois site [*R. A. Evers 85742* (ILLS)]. This taxon is extirpated from Illinois (Bowles et al. 1991).

Melampyrum lineare Desr. (cow-wheat)
Known specimens: Cook (ISM)
Status: Extirpated.

Cow-wheat is native to southeastern Canada, adjacent northeastern United States, and south in the Appalachian Mountains to Georgia. Jones and Fuller (1955) and Mohlenbrock (2002a) reported this species from Cook County where it was first collected in 1873 [Evanston, 8 Aug 1873, *P. Blatchford 2542* (ISM)], and most recently in 1952 [near small pond, Shabbona Woods, 27 Jul 1952, *F.A. Swink 1557* (ISM)]. This taxon was seen at Shabbona Woods during the Illinois Natural Areas Inventory (White 1978) but was not found during a search in 1988 (Bowles et al. 1991).

Penstemon canescens Britt. f. *brittonorum* (Pennell) Fern. (ashy beard-tongue)
Known specimens: Franklin (SIU).
Status: Extirpated.

The ashy beard-tongue is a species of wooded slopes in the mountains of southeastern United States, rarely occurring west to southern Indiana. Mohlenbrock (2002a) listed this species from Franklin County [woods, ¼ mile S of Franklin-Jefferson County Line Road, 1.5 miles E of Rend Lake, 7 May 1972, *D. Heaton 32* (SIU)], and we have been unable to locate other collections. The identification of this specimen has been confirmed by W. J. Elisens (2009). Attempts to locate this species in and around the original collecting site have been unsuccessful. This species is probably extirpated from Illinois.

SOLANACEAE
Physalis pumila Nutt. (dwarf ground cherry)
Known specimens: McHenry (ILLS), Peoria (ILL, ISM)
Status: Extirpated.

Dwarf ground cherry is native to the prairies and plains of western United States. Mohlenbrock (1990, 2002a) reported this species for Peoria County [above Horseshoe Bottom, Kickapoo Valley, 7 June 1921, *V.H. Chase 3570* (ILL, ISM)]. We found it in McHenry County [along railroad, near the first lock W of the Lyon Canal bridge, 9 Jun 1943, *R.J. Dobbs s.n.* (ILLS)]. This specimen was annotated by J. R. Sullivan (5/92) for the ''Flora of North America.'' The report of this species from Cook County by Pepoon (1927) could not be substantiated (Mohlenbrock 2002a).

VALERIANACEAE
Valerianella intermedia Dyal (corn salad)
Known specimens: None.
Status: Synonym of *Valerianella umbillicata* (Sulliv.) Wood.

Mohlenbrock (2002a) listed this species as rare, occurring in wet ground in Kankakee County. According to Gleason and Cronquist (1991) and Bowles et al. (1991) this is a synonym of *Valerianella umbillicata* which has been collected in Illinois as recently as 2004. Herkert and Kruse (1992) excluded *Valerianella intermedia* from our flora as it was based on misidentifications.

Valerianella patellaria (Sulliv.) Wood (corn salad)
Known specimens: None.
Status: Synonym of *Valerianella umbillicata* (Sulliv.) Wood.

Mohlenbrock (2002a) lists this species as rare, occurring in wet ground in LaSalle County. According to Gleason and Cronquist (1991), this is a synonym of *Valerianella umbillicata* (Sulliv.) Wood.

MONOCOTS

ALISMATACEAE
Sagittaria platyphylla (Engelm.) J.G. Sm. (arrowhead) [=*Sagittaria graminea* Michx. var. *platyphylla* Engelm.]
Known specimens: None.
Status: Voucher not located but possibly exists.

Native to the south central United States, this taxon is most common in lakes and slow moving streams of the Mississippi River Embayment south of Illinois (Durand 2000). Mohlenbrock (2002a) reported this species from St. Clair County, while Durand (2000) in the ''Flora of North America'' recorded it as disjunct in southern Illinois. We have not located any Illinois specimens.

CYPERACEAE
Carex baileyi Britt. (Bailey's sedge)
Known specimens: None.
Status: Voucher misidentified.

Bailey's sedge is restricted to the Appalachian Mountains where it grows in sedge meadows, marshes and on shores (Reznicek and Ford 2002). Mohlenbrock (2002a) listed this species from Jackson County, while Reznicek and Ford (2002) did not list this species for Illinois in the ''Flora of North America.'' This species was originally listed as endangered in Illinois by

Herkert (1994), but was removed from the list (Illinois Endangered Species Protection Board 1999) because the specimen was misidentified.

Ca*rex lucorum* Willd. (sedge)
[=*Carex pensylvanica* Lam. var. *lucorum* (Willd.) Fern.]
Known specimens: None.
Status: Voucher not located. **(State Endangered)**

Native to the northeastern United States and adjacent Canada, this sedge has been reported from Pope County by Mohlenbrock (2002a). Crins and Rettig (2002) in the ''Flora of North America'' did not report this species for Illinois. Mohlenbrock (1999a) lists the following specimen (Pope Co., Hayes Creek Canyon, 1981, *L. Stritch s.n.*) that we have been unable to locate (Mohlenbrock 2009). It is presently listed as an Illinois endangered species (Herkert and Ebinger 2002). If no voucher is found, *Carex lucorum* should be removed from the endangered species list.

Carex pallescens L. (pale sedge)
[*Carex pallescens* L. var. *neogaea* Fern.]
Known specimens: northern Illinois (ILL).
Status: Extirpated.

This taxon is native to the northeastern United States and adjacent Canada (Ball 2002). Mohlenbrock (1999a, 2002a) listed this species for Fulton, Hancock, Johnson, McHenry, and Saline counties, but Ball (2002) in the ''Flora of North America'' did not record this species for Illinois. According to Bowles et al. (1991), this species is known in Illinois from only one collection made during the last 100 years. The only Illinois specimen located [Northern Illinois, *G. Vasey s.n.* (ILL)] was annotated by A. A. Reznicek, 2004.

Carex striatula Michx. (lined sedge)
Known specimens: None.
Status: Voucher misidentified. **(State Endangered)**

A woodland species of the southeastern United States, Mohlenbrock (2002a) recorded this species from extreme southern Illinois. Bryson and Naczi (2002) in the ''Flora of North America'' did not list this species for Illinois. Bowles et al. (1991) lists one collection [Jackson Co., Cedar Lake Reservoir, 1 May 1976, *T. E. Heinke 1657* (SIU)]. This specimen was annotated as a variety of *Carex laxiculmis* Schwein by A. A. Reznicek, 1997 for the ''Flora of North America.'' Though listed as endangered in Illinois (Herkert and Ebinger 2002), we doubt *Carex striatula* is a native element of the Illinois flora.

Carex styloflexa Buckl. (sedge)
Known specimens: None.
Status: Voucher misidentified.

Nature to eastern United States, this woodland species is associated with sandy, acid soils of seeps and springs (Byson and Naczi 2002). Originally listed as endangered in Illinois this sedge was reported for Jackson, Pope, and Union counties (Sheviak 1981). It was removed from the list when the specimens were found to be misidentified (Illinois Endangered Species Protection Board 1999). Bryson and Naczi (2002) in the ''Flora of North America'' did not record this species for Illinois.

Carex tincta (Fern.) Fern. (sedge)
Known specimens: None.
Status: Voucher misidentified.

Native to northeastern United States and adjacent Canada, *Carex tincta* was first reported for Illinois in the ''Flora of North America'' (Mastrogiuseppe et al. 2002). Recent examination of the Illinois specimen [Cook Co., Palos Park, Jun 1923, A. Butler s.n. (F)] by Rotherock et al. (2009) indicates that the report for Illinois was based on a misidentification.

Eleocharis bella (Piper) Svenson (pretty spikerush)
Known specimens: Peoria (F).
Status: Extirpated.

Eleocharis bella, native to the Rocky Mountains and the western United States, was first reported for Illinois by Smith (2002a) in the ''Flora of North America'' [Peoria Co., alluvial shores along Illinois River, Peoria, Aug 1901, *F. E. McDonald s.n.* (F)]. A specimen (F#121166) of this adventive species has been located and photocopies are available at EIU and ILLS.

Eleocharis equisetoides (Ell.) Torr. (horsetail spikerush)
Known specimens: Cook (GH)
Status: Extirpated.

This species of open wetlands is native to much of the eastern United States (González-Elizondo 2002). Jones and Fuller (1955) and later Mohlenbrock (2001a, 2002a) reported this species from Cook County [Illinois, Chicago, Wolf Lake, 1890, *E. J. Hill s.n.* (GH)]. There are two specimens on the sheet at GH, the basal part of a sterile *E. quadrangulata*, and the top parts of six culms of *E. equisetoides* (Boufford 2009). Bowles et al. (1991) considers this species as extirpated, while González-Elizondo (2002) did not list this species for Illinois in the ''Flora of North America.''

Eriophorum viridicarinatum (Engelm.) Fern. (cotton sedge)
Known specimens: Du Page (ILL), Lake (ILL), Rock Island (WIS).
Status: Extirpated.

This wetland species is native to the northern United States and adjacent Canada (Ball and Wujek 2002).

Mohlenbrock (2002a) listed this species for Lake, Rock Island, and Winnebago counties. We found a Lake County specimen [tamarack swamp, Tam-a-rack Farm of Mr. Garland, 2 miles NW of Volo, 5 May 1946, *J. A. Steyermark 63491* (ILL)], and one from Du Page County [bogs, Warrenville, 11 May 1895, *L. M. Umbach s.n.* (ILL)], while Jones and Fuller (1955) listed a specimen from Rock Island County [Port Byron, Aug 1885, *E. T. Harper s.n.* (WIS)].

Fimbristylis annua (All.) Roem. & Schultes (fimbry)
[=*Fimbristylis bladwiniana* (Schultes) Torr.]
Known specimens: Alexander (SIU), Massac (ILL).
Status: Extirpated.

A common pan-tropical species, fimbry is found in much of eastern United States and south into Central and South America (Kral 2002a). Mohlenbrock (2002a) listed this species for Alexander, Johnson and Massac counties, and we have located specimens from Alexander County [edge of field, Horseshoe Lake, 17 Aug 1968, *J. S. Huston 200* (SIU)] and Massac County [lumber yard, Metropolis, 10 Aug 1950, *H. E. Ahles 2805* (ILL)]. This taxon was originally listed as endangered in Illinois (Scheviak 1981) while Herkert (1998) considered it extirpated.

Fuirena scirpoidea Michx. (umbrella grass)
Known specimens: Hamilton (?).
Status: Extirpated. Voucher not located but possibly exists.

Umbrella sedge is mostly a sea-coast species of brackish marshes in the southeastern United States (Kral 2002b). Mohlenbrock (2001a, 2002a) reported this species from Hamilton County (edge of Dolan Lake, 1970, *N. Tracy s.n.*). Kral (2002b) in the ''Flora of North America'' did not list umbrella sedge for Illinois. According to Mohlenbrock (2009), this specimen was originally in the SIU herbarium but has been lost. This adventive species is extirpated from Illinois (Herkert and Kruse 1992).

Lipocarpha maculate (Michx.) Torr. (mottled lipocarpha)
Known specimens: Cass (ILL, ISM, SIU).
Status: Extirpated.

An emergent species of sandy shorelines, this taxon is native to the central United States (Tucker 2002). Mohlenbrock (2002a) listed this species for Cass County. Many collections of this species were made between 1958 and 1963 from around ponds near the towns of Beardstown and Virginia by R.T. Rexroat. Suitable habitat is available throughout the Illinois River sand deposits, and this species may again appear (Bowles et al. 1991).

Rhynchospora globularis (Chapm.) Small (beaked rush)
Known specimens: Cook (ILLS, ISM), Kankakee (ILL).
Status: Extirpated.

Native to the southeastern United States (Kral 2002c), this species was reported from Cook and Kankakee counties (Mohlenbrock 2002a). This taxon was last collected in Cook County in 1940 [Thornton, 22 Jul 1940, *G.D. Fuller 2294* (ILLS, ISM)], while Jones and Fuller (1955) listed two Kankakee County collections [border of slough, south of Kankakee River, 8 Jul 1870, *E. J. Hill s.n.* (ILL); wet sand barrens, Kankakee, 3 Jul 1871, *E. J. Hill s.n.* (ILL)]. Probably extirpated from Illinois (Bowles et al. 1991), Kral (2002c) did not list this species for Illinois in the ''Flora of North America.''

Rhynchospora macrostachya Torr. (beaked rush)
Known specimens: None.
Status: Voucher misidentified.

This taxon, native to the northeastern and south central United States, was reported for Pulaski County by Mohlenbrock et al. (1962). Listed as endangered in Illinois, Bowles et al (1991) and Herkert and Kruse (1992) indicated that there were no specimens substantiating the occurrence of this taxon in Illinois. Kral (2002c) did not list this species for Illinois in the ''Flora of North America.''

Schoenoplectus subterminalis (Torr.) Sojak (waterbulrush)
[=*Scirpus subterminalis* Torr.]
Known specimens: Cook (ILL), Lake (EIU, WIS).
Status: Extirpated.

A submersed to emergent aquatic that is native to eastern and northwestern United States and adjacent Canada (Smith 2002b). Reported from Cook and Lake counties by Mohlenbrock (2002a) we have located the Lake County specimen [swampy habitat, Waukegan, 10 Jul 1891, *R. A. Harper s.n.* (EIU, WIS)], while Jones and Fuller (1955) listed a Cook County specimen [shallow water of Wolf Lake, Chicago, 26 Jul 1890, *E. J. Hill s.n.* (ILL)]. Smith (2002b) listed this species for Illinois in the ''Flora of North America'' and indicated that it is probably extirpated from the state.

Schoenoplectus torreyi (Olney) Palla (Torrey's bulrush)
[=*Scirpus torreyi* Olney]
Known specimens: Lee (ILL), St. Clair (MO).
Status: Extirpated.

Native to the northeastern United States and adjacent Canada (Smith 2002b), this species is listed for Lee, Marshall, St. Clair and Winnebago counties (Mohlenbrock 2002a). The last collection of this species in Illinois was from Lee County [pond near Amboy, 23 Jul 1959, *J. B. Long 985* (ILL)]. We have seen the St. Clair County specimen [pond in woods E of Bellville, Jun 1834, *G. Engelmann 18* (MO)] but have not located a specimen for Winnebago or Marshall

counties. This species is probably extirpated, but could reappear, being brought into the state by waterfowl.

Scirpus pedicellatus Fern. (stalked bulrush)
[*Scirpus cyperinus* L. var. *pedicellatus* (Fern.) Schuyler]
Known specimens: Cook (F, MO).
Status: Extirpated.

This wetland species is native to the northeastern United States and adjacent Canada (Whittemore and Schuyler 2002). Reported for Cook, Du Page and Pope counties by Mohlenbrock (2002a), we have been unable to locate a specimen from Du Page County. Four collections of this species are known from Cook County [west shore of Lake Michigan, Glencoe, 7 Aug 1926, *J. R. Churchill s.n.* (MO); Skokie Marsh, Glencoe, 10 Aug 1926, *J. R. Churchill s.n.* (MO); sandy swamp, Thornton, 15 Jul 1939, *G. D. Fuller 1680* (F); sandy swamp, Thornton, 22 Jul 1940, *G. D. Fuller 2291* (F)]. The two Fuller specimens were annotated by A. A. Reznicek, 2002. The Pope County specimen [along creek, Hayes Creek Canyon, 17 Jul 1952, *W. M. Bailey & J. R. Swayne 2665*, (SIU)] was recently annotated *Scirpus cyperinus* (L.) Kunth by G.C. Tucker, 2008. The stalked bulrush is probably extirpated from Illinois (Schuyler 1964, Bowles et al. 1991, Herkert and Kruse 1992), but could reappear, being brought into the state by waterfowl.

Trichophorum planifolium (Spreng.) Palla (bulrush)
[=*Scirpus verecundus* Fern.; *Trichophorum verecundum* (Fern.) Mohlenbr.]
Known specimens: Alexander (SIU).
Status: Extirpated.

This upland species of dry woodland slopes is native to the northeastern United States and adjacent Canada (Crins 2002). Mohlenbrock (2002a) reported this species from cherty slopes in Alexander and Union counties. We located the Alexander County specimen [along Grapevine Trail, 16 Apr 1974, *R.H. Mohlenbrock s.n.* (SIU)], while the Union County report is a site record and no voucher was collected (Bowles et al. 1991). This taxon was listed as state endangered until it was considered extirpated from Illinois (Nyboer and Ebinger 2004).

LILIACEAE
Clintonia borealis (Ait.) Raf. (bluebead lily)
Known specimens: Cook (F, MOR).
Status: Extirpated.

A species of mesic woods that is native to the northeastern United States, adjacent Canada, and south in the Appalachian Mountains to Georgia (Utech 2002). Mohlenbrock (2002a) listed this species for Cook County based on a specimen found by Swink (1988) [Maplewood, 12 Jun 1908, *C. W. Duesner s.n* (F)] that was annotated by F. H. Utech, 1973. No other specimens have been located and this taxon is undoubtedly extirpated.

Trillium cuneatum Raf. (Whip-poor-will flower, little sweet trillium)
Known specimens: None.
Status: Voucher misidentified.

This taxon is native to the southeastern United States in Alabama, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee (Case 2002). According to John E. Schwegman (2007), the report of this species in Illinois is based on a misidentification, the specimens referable to *Trillium viride* Beck. [Giant City State Park, 28 Apr 1960, R. H. Mohlenbrock 14214 (SIU)] Case (2002) in the ''Flora of North America'' does not report this species from Illinois but mentions that Whip-poor-will flower escapes locally from plantings.

ORCHIDACEAE
Arethusa bulbosa L. (dragon's-mouth orchid)
Known specimens: None.
Status: Not vouchered for Illinois.

A species of sphagnum bogs, fens, and marshes, this orchid is native to the northeastern United States and adjacent Canada (Sheviak and Catlin 2002). According to Jones and Fuller (1955) this species was found in a ''marsh near South Chicago, *Bastin*'' based on a report by Higley and Raddin (1891). We could not confirm a specimen for Illinois, nor could Sheviak and Catlin (2002) in the ''Flora of North America.'' Mohlenbrock (1970b) excluded this species from the Illinois flora as he was unable to locate a specimen.

Corallorhiza trifida Chatel (pale coral-root orchid)
Known specimens: None.
Status: Voucher misidentified.

This orchid is native to northern United States and most of Canada (Magrath and Freudenstein 2002). Jones and Fuller (1955) were not able to locate a specimen for Illinois though it was reported by Higley and Raddin (1891). Mohlenbrock (1970b) lists this species from St. Clair County citing the following specimen [10 May 1897, *J. Kellogg s.n.*(MO)]. Sheviak (1974) listed this taxon for Cook County based on a report by Higley and Radden (1891), but could not locate a specimen. We have not been able to locate a specimen from Illinois although Magrath and Freudenstein (2002) in the ''Flora of North America'' listed a disjunct citing from southern Illinois that now appears to be an error (Freudenstein 2008). We doubt the existence of an Illinois voucher, though some early collection could have been lost (Sheviak 1974).

Isotria meleoloides (Pursh) Raf. (small whorled pogonia)

Known specimens: Randolph (SIU).
Status: Extirpated. **(State Endangered)**

This Illinois endangered species grows on acid soils in dry to mesic second growth deciduous forests. Native to the northeastern United States and the Appalachian Mountains to South Carolina (Mehrhoff and Homoya 2002), Mohlenbrock (2002a) reported this species on a wooded slope of a sandstone cliff in Randolph County [north-facing bluff, 20 Oct 1973, *M. Homoya*, *L. Mehrhoff & J. Schwegman s.n.* (SIU)]. Listed for Illinois by Mehrhoff and Homoya (2002), this species was last seen in 1991 and is considered extirpated (Phillippe et al. 2000).

Malaxis brachypoda (Gray) Fern. (white adder's-mouth orchid)
[=*Malaxis monophyllos* (L.) Sw.; *Malaxis monophyllos*(L.) Sw. var. *barchypoda* (A. Gray) F. Morris & Eames]
Known specimens: Kane (ISU).
Status: Extirpated.

A species of damp woods and bogs, this taxon is native to the northern United States and adjacent Canada (Catling and Magrath 2002). Mohlenbrock (2002a) reported this orchid from a bog in Kane County [swamp, Elgin, *G. Vasey 3366* (ISU)]. This specimen was annotated by Morris and Eames, the authors of the combination. Also, Mohlenbrock (1970b) mentions a specimen of this species at MO (bogs, Ill., *G. Vasey s.n.*).

Malaxis unifolia Michx. (green adder's-mouth orchid)
Known specimens: Hancock (KNOX), Henderson (F), Menard (F, ILL, ISM, NY).
Status: Extirpated.

Found in swamps, bogs, sand barrens, and moist woods, this orchid species is native to the eastern United States and adjacent Canada (Catling and Magrath 2002). Reported for Hancock, Henderson, and Menard counties by Mohlenbrock (2002a), we have specimens from Hancock County [dry woods, Augusta, 12 Jul 1852, *S. B. Mead s.n.* (KNOX) (Sheviak 2008)], Henderson County [woods near Oquawka, 13 Jun 1872, *H.N. Patterson s.n.* (F)], and Menard County [woods, Athens. 1861, *E. Hall s.n.* (F, ILL, ISM, NY); Athens, 1866, *E. Hall s.n.* (F)].

Platanthera hookeri (Torr.) Lindl. (Hooker's orchid)
[=*Habenaria hookeri* Torr.]
Known specimens: Cook (ILL, ISM), Hancock (ILL, KNOX), Lake (ILL).
Status: Extirpated.

A species of dry to mesic, rich forests, Hooker's orchid is native to the northeastern and north-central United States and adjacent Canada (Sheviak 2002). Jones and Fuller (1955) listed this species for Cook and Lake counties, while Mohlenbrock (2002a) added Hancock County. Specimens were located for Cook County [rich woods, Des Plaines, 21 Jun 1891, *W. S. Moffatt 1556* (ILL)], Hancock County [woods W of Bob Brown's, *S. B. Mead s.n.* (ILL, KNOX)], and Lake County [woods, Highland Park, 22 May 1880, *E. J. Hill s.n.* (ILL)]. The last known collection was from Cook County [rich oak woods, Des Plains, Elk Grove, 16 Jun 1943, *G. Pearsall 8345* (ISM)]. According to Bowles et al. (1991) and Herkert and Kruse (1992), this species is extirpated from Illinois.

Spiranthes romanzoffiana Chapm. (hooded ladies' tresses)
Known specimens: Coles (EIU), Cook (ISM), McHenry (MOR), Peoria (photo MO).
Status: Extirpated.

An Illinois endangered species, hooded ladies' tresses is native to the northern United States and much of Canada (Sheviak and Brown 2002). Mohlenbrock (2002a) listed this species for Coles, Cook, McHenry, and Peoria counties. Four specimens have been located, one from each county: Coles County [Lincoln Log Cabin, Oct 1947, *E.L. Stover* s.n. (EIU)], Cook County [Glencoe, 8 May 1873, *P. Blatchford 2525* (ISM)], McHenry County [bog on SW shore of Elizabeth Lake, NE of Richmond, 8 Aug. 1977, *J. Sheviak & M. Bowles 1240* (MOR)], and Peoria County [Peoria, Illinois with no collector or number given]. P. M. Catling annotated this specimen (US27771) in 1980 (Strong 2008). This taxon was listed as state endangered until it was considered extirpated from Illinois (Nyboer and Ebinger 2004).

POACEAE
Aristida intermedia Scribn. & Ball var. *necopina* (Shinners) Mohlenbr.
[=*Aristida necopina* Shinners; *Aristida longespica* Poir. var. *geniculata* (Raf.) Fern.].
Known specimens: Lee (ILL)
Status: Synonym of *Aristida longespica* Poir. var. *genicilata* (Raf.) Fern.

According to Allred (2003) in the ''Flora of North America,'' this is a synonym of the very common *Aristida longespica* Poir. var. *geniculata* (Raf.) Fern. The holotype is located at ILL (Lee Co., among sand dunes, Sec 10 of May Tp., 1 Sep 1935, *V.H. Chase 5302*).

Cinna latifolia (Trev.) Griesb. (slender wood reed, drooping wood reed)
Known specimens: Kane (F, ILL, ISU).
Status: Extirpated.

The slender wood reed is a circumboreal species native to most of central and southern Canada and northern United States (Brandenburg 2007). A species

of moist woods, Jones and Fuller (1955) and Mohlenbrock (2002a) recorded this taxon for Cook, Kane, Lake, and Winnebago counties. We have seen three duplicate specimens from Kane County [Elgin, *G. Vasey s.n.* (F, ILL, ISU)], the F specimen annotated by D.M. Brandenburg, 1980. We have been unable to locate specimens from Cook, Lake, and Winnebago counties, but have seen specimens from those counties labeled *C. latifolia* that on close examination are *C. arundinacea* L. This species is probably extirpated from Illinois (Bowles et al. 1991, Herkert and Kruse 1992).

Dichanthelium nitidum (Lam.) Mohlenbr. (shiny panic grass).
[=*Panicum nitidum* Lam.; *Dichanthelium dichotomum* (L.) Gould])
Known specimens: None.
Status: Voucher misidentified.

According to Gleason and Cronquist (1991) this is a synonym of the common *Panicum dichotomum* L. (=*Dichanthelium dichotomum*). Freckman and Lelong (2003a) do not list *Dichanthelium nitidum* in the ''Flora of North America.'' Mohlenbrock (2002b) listed the voucher for this name [Union Co., Union State Forest, 12 Jun 1968, *R. A. Evers 95058* (ILLS, MO)] that is now referable to *Dichanthelium dichotomum*. Bowles et al. (1991) and Herkert and Kruse (1992) considered the report of this species for Illinois was based on a misidentification.

Erianthus brevibarbis Michx. (brown plume grass)
[=*Saccharum brevibarbe* (Michx.) Pers.]
Known specimens: None.
Status: Not vouchered for Illinois.

A large grass native to the coastal state of the southeastern United States. Mohlenbrock (2002a) listed this species from dry hills in southwestern Illinois, and indicated that the type specimen was in southwestern Illinois (Fernald 1945). Webster (2003) does not list this taxon for Illinois in the ''Flora of North America,'' indicating that it is restricted to the southeastern United States, extending north to Arkansas and Tennessee. It is doubtful that brown plume grass is a native member of the Illinois flora.

Glyceria borealis (Nash) Batchelder (northern manna grass, boreal Glyceria)
Known specimens: Cook (ISM), Lake (F), Stephenson (ISM, RCK).
Status: Extirpated.

A taxon of muddy shores of lakes, ponds, and streams that is native to the northern United States, adjacent Canada, and through the Rocky Mountains into Mexico (Barkworth and Anderton 2007). Mohlenbrock (2002a) listed this species for Cook, Jo Davies, Lake, and Stephenson counties. We have located specimens from Cook County (ditch, Park Forest, 11 Jul 1959, *C. Heitmann & D. Heitmann 865* (ISM)], Lake County [tamarack swamp, 2 miles NW of Volo, 22 Jun 1946, *J. A. Steyermark 63768* (F)], and Stephenson County [prairie slough, SE of Ridott, 17 Jun 1953, *E. W. Fell 53520* (ISM)]. Jones and Fuller (1955) listed a specimen from Jo Davies County [margin of pond near East Dubuque, *H. S. Pepoon 426* (ILL)]. Bowles et al. (1991) could not find an extant population of this species and considered it extirpated from the state.

Glyceria canadensis (Michx) Trin. (rattlesnake manna grass)
Known specimens: Cook (ILLS, ISM), Peoria (ILL), Tazwell (ILL).
Status: Extirpated.

A species of wet open sites native to the northeastern United States and adjacent Canada (Barkworth and Anderton 2007). Mohlenbrock (2002a) listed this taxon for Cook, Peoria, and Tazewell counties. We have seen specimens from Cook County [swamp, Dolton, 25 Sep 1943, *G. D. Fuller 8251* (ILLS, ISM)], Peoria County [Jul 1882, *A. J. Heading s.n.* (ILL)]; and Tazewell County [near Peoria, *F. Brendel s.n.* (ILL)]. Bowles et al. (1991) and Herkert and Kruse (1992) consider this species extirpated.

Gymnopogon ambiguus (Michx.) BSP. (bearded skeletongrass, beard grass)
Known specimens: Pope (ILLS, SIU).
Status: Extirpated.

A species of sandy and gravelly soils, bearded skeletongrass is native to the southeastern United States extending north to southern Illinois (Smith 2003). Mohlenbrock (2002a) listed this species from Pope County [North Fork of Burke Creek, 16 Nov 1966, *J. Schwegman 1088* (SIU); North Fork of Burke Creek, 5 Aug 1967, *J. Schwegman 1346* (ILLS)]. This species is presumed extirpated from the state, but if large scale burnings of barrens remnants were to be undertaken, this taxon might reappear.

Milium effusum L. (millet grass, wood millet)
Known specimens: Kane (ILL), Tazewell (ILL).
Status: Extirpated. **(State Endangered)**

Millet grass is a woodland species native to the northeastern United States and adjacent Canada (Crins 2007). Reported from Cook, Kane, and Tazewell counties by Mohlenbrock (2002a), we have located collections from Kane County [Elgin, *G. Vasey s.n.* (ILL)], Tazewell County [*F. Brendel s.n.* (ILL)], and one from ''northern Illinois'' [swamps, *G. Vasey 3870* (ISU)]. This taxon has not been seen in Illinois since the nineteenth century (Mohlenbrock 2002b).

Crins (2007) listed this taxon for Illinois though it is now probably extirpated.

Nassella viridula (Trin.) Barkworth (feather grass, green needlegrass)
[=*Stipa viridula* Trin.]
Known specimens: Du Page (ILL), Kane (F), McHenry (F, ILL).
Status: Extirpated.

This grassland species is native to north-central United States and adjacent Canada (Barkworth 2007c). Jones and Fuller (1955) reported specimens from Kane County [near railroad tracks and pond, northwest of Pingree Grove, 28 Jul 1916, *H. C. Benke 1522* (F)] and McHenry County [woodland border, Fox River Grove, 7 Jun 1948, *V. H. Chase 9573* (F, ILL)]. We also located a specimen from Du Page County [railroad tracks, West Chicago, 26 Jun 1897, *L. M. Umbach s.n.* (ILL)].

Oryzopsis pungens (Torr.) Hitchc. (sharp piptatherum, rice grass)
[=*Piptatherum pungens* (Torr.) Barkworth]
Known specimens: Illinois (ILL)
Status: Extirpated.

A species of northeastern United States and most of southern Canada, this taxon grows in sandy to rocky soils in open habitats (Barkworth 2007a, 2007b). Mohlenbrock (2002a) listed this species for Menard County. We have located two specimens at ILL with only ''Illinois'' written on the label which may possibly represent native plants, while Mohlenbrock (2002b) mentions an *E. Hall s.n.* specimen collected in the nineteenth century. This species, if it was ever present in Illinois, is now extirpated.

Panicum longifolium Torr. (long-leaved panicum)
[=*Panicum rigidulum* Bosc subsp. *pubescens* (Vasey) Freckmann & Lelong]
Known specimens: Monroe (SIU).
Status: Extirpated.

A common grass species of open sandy habitats on the Atlantic and Gulf coastal plains of the United States, it has been reported from Monroe County by Mohlenbrock (2001b, 2002a) [rocky ledge in wooded ravine on the top of a limestone cliff, Fults, 25 Oct 1962, *J. Ozment*, *R. Mohlenbrock & W. Crews 12799* (SIU)]. This is the only known collection or sighting of this species in Illinois and the long-leaved panicum is considered extirpated from the state (Bowles et al. 1991).

Panicum stipitatum Nash (stalked panicum)
[=*Panicum agrostoides* Spreng. var. *elongatum* Scribn.; *Panicum rigidulum* Bosc var. *elongatum* (Scribn.) Freckmann & Lelong]
Known specimens: None.
Status: Not vouchered for Illinois.

A common grass taxon of the piedmont and mountain regions of the eastern United States, Mohlenbrock (2002a) listed this species for Johnson County [low ground, 1 mile W of West Vienna, 27 Jun 1964, *R. H. Mohlenbrock 12634* (SIU)]. According to Bowles et al. (1991), this specimen is immature and cannot be positively ascribed to *P. stipitatum*. Unless better material is available, we feel this taxon should not be considered a native element of the Illinois flora.

Panicum verrucosum Muhl. (warty panicum)
[=*Panicum hians* (Ell.) Nash]
Known specimens: Alexander (SIU)
Status: Extirpated.

This taxon grows in open, moist, often sandy areas, particularly disturbed sites, and is native to the eastern United States where it is most common in coastal areas (Freckmann and Lelong 2003b). Mohlenbrock (2002a) reported this species from Alexander County [roadside ditch near Gale, 30 Jun 1968, *R. H. Mohlenbrock 13004* (SIU)]. This is the only collection or sighting of this species in Illinois, and it is now presumed extirpated from the state.

Paspalum lentiferum Lam. (bead grass)
[=*Paspalum praecox* Walt.]
Known specimens: Pulaski (SIU).
Status: Extirpated.

This species occurs in open, often disturbed habitats and is native to the southeastern coastal plain of the United States (Allen and Hall 2003). Disjunct and probably adventive in southern Illinois, this taxon was reported for Pulaski County by Mohlenbrock (2002a) [roadside ditch near Karnak, Sep 1961, *S. Boyce s.n.* (SIU)]. According to Allen and Hall (2003) in the ''Flora of North America'', the correct name for this species is *Paspalum praecox*, and they list a disjunct specimen for southern Illinois. This species is now probably extirpated from the state (Bowles et al. 1991).

Poa autumnalis Muhl. (autumn blue grass)
Known specimens: Pope (SIU).
Status: Extirpated.

Native to the eastern United States, this taxon is most common in forests of the eastern and western Appalachian piedmont and coastal plain (Soreng 2007). Mohlenbrock (2002a) listed this taxon for Pope County [moist woods, Jackson Hollow, 28 Mar 1963, *R. H. Mohlenbrock 11262* (SIU)]. This species, if it was present in Illinois, is now extirpated. It was listed for Illinois by Soreng (2007) in ''Flora of North America.''

Poa paludigena Fern. & Wieg. (marsh blue grass, eastern bog blue grass)

Known specimens: Kane (GH).
Status: Extirpated.

A species of shady bogs and fens, this species is scattered in northeastern United States (Soreng 2007). Marsh blue grass was reported for Kane County by Mohlenbrock (2002a), while Jones and Fuller (1955) did not list a specimen. We have located a Kane County specimen that appears to be this species [Elgin Swamp, *G. Vasey s.n.* (GH) (Boufford 2008)]. Soreng (2007), in the ''Flora of North America'' reported this taxon for the state, though it is likely extirpated.

POTAMOGETONACEAE
Potamogeton vaseyi Robbins. (Vasey's pondweed)
Known specimens: McHenry (F, ISU, MWI).
Status: Extirpated.

This submersed aquatic is native to the northeastern United States and adjacent Canada (Haynes and Hellquist 2000). The only valid Illinois specimens are early collections from McHenry County [in water, Ringwood, *G. Vasey 3330* (ISU); Ringwood, 1870, *E. Hall s.n.* (F, MWI)]. It is presumed extirpated from Illinois.

SCHEUCHZERIACEAE (Juncaginaceae)
Scheuchzeria palustris L. (arrow-grass)
Known specimens: Lake (ILLS), McHenry (F, ILL, ISU, KNOX).
Status: Extirpated.

This species of arrow-grass is an emergent and shoreline species native to northern United States and much of Canada (Nienaber 2000). Mohlenbrock (1970a, 2002a) listed this species for Fulton, Lake, McHenry, and Menard counties. We have seen collections from Fulton County [Camden, Il., 1866, *J. Wolf s.n.* (F)]; Lake County [Volo Bog, 25 Jul 1952, *R. A. Evers 34927* (ILLS), annotated by R. R. Haynes, 1995], and McHenry County [Ringwood, 1 Jun 1860, *G. Vasey s.n.* (KNOX); Richmond, 16 Jun 1864, *G. Vasey s.n.* (ILL), Ringwood, *G. Vasey s.n.* (F, ILL), swamp, N. Ill., *G. Vasey 3346* (ISU)].

SMILACACEAE
Smilax herbacea L. (carrion flower)
Known specimens: None.
Status: Voucher misidentified.

This climbing annual usually occurs in rich woods and thickets mostly in the Appalachian Mountains of eastern United States and adjacent Canada (Holmes 2000). Mohlenbrock (1970b, 2002a) reported this species from Jackson County (moist woods, Lake Murphysboro State Park, 1 May 1960, *R.H. Mohlenbrock 13317*), but this specimen is *Smilax lasioneuron* Hooker (annotated by L. R. Phillippe, 2008). Holmes (2000) in the ''Flora of North America'' did not report this taxon for Illinois, and it is doubtful that *Smilax herbacea* occurs, or has ever occurred, in Illinois.

SPARGANIACEAE
Sparganium natans L. (least bur-reed)
[=*Sparganium minimum* (Hartm.) Fries]
Known specimens: None.
Status: Not vouchered for Illinois.

An emergent species of bays, pools, ditches, and peat bogs, least bur-reed is native to northern United States and much of Canada (Kaul 2002). Jones and Fuller (1955) and Mohlenbrock (2002a) listed this species for McHenry County [Ringwood, *G. Vasey s.n.*], but expressed doubt as to the validity of the location. This species has been reported from northeastern Illinois by Kaul (2002) in ''Flora of North America,'' but expressed doubt at the occurrence of this species in Illinois. We have been unable to locate this specimen.

THISMIACEAE
Thismia americana N.E. Pfeiffer (Thismia)
Known specimens: Cook (F).
Status: Extirpated.

This very rare species is known only from a few Cook County collections where it was found in moist sand prairies that have since been destroyed (Bowles et al. 1991). According to Mohlenbrock (2002a) and Lewis (2002), this taxon was collected between 1912–1916 and has not been seen since [Cook Co., open prairie, *N. Pfeiffer s.n.* (F)]. Mohlenbrock (1985) gives an interesting review of the status of this species.

ERIGENIA, Number 23, Winter 2010, pp 24–33

FLORA AND SPECIES DOMINANCE OF GREEN PRAIRIE, JASPER COUNTY, ILLINOIS – A GLACIAL DRIFT HILL PRAIRIE ON ILLINOIAN TILL

Bob Edgin[1], Samantha J. Adams[2], Emily J. Stork[3], and John Ebinger[4]

ABSTRACT: The vascular flora of Green Glacial Drift Hill Prairie, Jasper County, Illinois was studied during the 2008–2009 growing seasons. The 0.75 ha glacial drift hill prairie is located on south- and southwest-facing slopes associated with Range Creek, a tributary of the Embarras River. The flora was determined during periodic visits over the two growing seasons. The structure was determined using twenty five 1 m^2 square quadrats located at 1 m intervals on alternating sides of each of two randomly located transect lines. Frequency, mean cover, relative frequency, relative cover, and importance value (I. V. total = 100) were determined. A total of 179 vascular plant taxa were observed on the site, 70 of which were encountered during sampling. *Andropogon gerardii* (big bluestem) had the highest importance value (15.1) followed by *Solidago nemoralis* (IV = 10.1), *Potentilla simplex* (7.2), and *Pycnanthemum tenuifolium* (6.0). Non-native species were represented by 15 taxa (8.2% of all taxa) of which *Taraxacum officinale* (dandelion), *Tragopogon dubius* (yellow salsify) and *Barbarea vulgaris* var. *arcuata* (yellow rocket) were represented by a single individual. The mean coefficient of conservatism of the site was 3.65 and the Floristic Quality Index was 46.3. Green Prairie is also compared to other glacial drift hill prairies in Illinois.

INTRODUCTION

The occurrence of small prairie openings in otherwise forested landscapes of east-central Illinois was first noted by Vestal (1918). These small, usually <1 ha, prairies developed near the crest of slopes or spurs on Wisconsin age glacial till. Although Vestal postulated that "small prairie patches in the woods are common along the Embarras River…", he identified only 10 such areas in his study and they remain much less common than loess hill prairies (Vestal 1918, Evers 1955). Reeves et al. (1978) examined the microclimate of these prairies and the vegetation has been the focus of several studies (Ebinger 1981, Behnke and Ebinger 1989, Owens and Cole 2003, Owens and Ebinger 2008). More recent studies have examined glacial drift hill prairies near central Illinois (McClain et al. 2002, Owens et al. 2006).

Glacial drift hill prairies have many edaphic, physical and floristic similarities. They occur on steep south- to southwest-facing slopes with well-drained soils that are low in organic content and nutrients (Ebinger 1981, McClain et al. 2002, Owens et al. 2006, Owens and Ebinger 2008). The predominant vegetation is usually native warm season grasses complemented by prairie forbs. Drying winds, unstable soil, fire, cutting, and grazing were thought to play significant roles in the development and maintenance of these sites (Vestal 1918, Reeves et al. 1978). Green Prairie, located on Illlinoian-aged glacial till in the middle reaches of the Embarras River is another example of these glacial drift hill prairies.

DESCRIPTION OF THE STUDY SITE

Green Glacial Drift Hill Prairie is located in east-central Illinois, about 3 km northwest of Hidalgo, Jasper County, Illinois (NE/4, NE/4, S2, T8N, R9E, 3PM; 39°10′14″ N, 88°10′24″ W). The 0.75 ha (1.82 acre) prairie occurs on southwest and west-facing slopes overlooking Range Creek, a tributary of the Embarras River. It is located in the Effingham Plain

[1] Illinois Nature Preserves Commission, One Natural Resources Way, Springfield, Illinois 61720; Corresponding author.
[2] Eastern Illinois University, 600 Lincoln Avenue, Charleston, Illinois 61920.
[3] Applied Ecological Services, Sparta, Illinois.
[4] John E. Ebinger, Emeritus, Eastern Illinois University, 600 Lincoln Avenue, Charleston, Illinois 61920.

Section of the Southern Till Plain Natural Division of Illinois (Schwegman et al. 1973). The Effingham Plain Section is relatively flat. Historically, most of it was covered by mesic tallgrass prairie with forests confined to the floodplains and more dissected areas.

The soil at Green Glacial Drift Hill Prairie is eroded Hickory loam, a steep, well-drained soil that occurs on side slopes of 18–35% along drainages in uplands (Bramstedt 1992). This soil was formed by weathering of Illinoian-age glacial till on slopes where practically all of the loess deposits have been lost to erosion leaving a friable loam layer about eight cm thick (Fehrenbacher and Odell 1956, Bramstedt 1992). The soil is usually acidic, low in available phosphorus and low to medium in available potassium. Water and air move through the soil at a moderate rate and available water-holding capacity is high (Bramstedt 1992). The subsoil is about 114 cm thick. The upper part is clay loam, the lower loam. Mean annual precipitation in Newton, Jasper County, Illinois, the nearest reporting station, is 104.8 cm with May having the highest precipitation at 11. 2 cm (Illinois State Water Survey 2007). The mean annual temperature is 11.4°C with July being the hottest month (mean temperature = 29.2°C), the coldest is January (mean temperature = −3.1°C). Elevation of the site ranges from 165 m above mean sea level at the base of the slope on the west side to 177 m at the top of the slope on the east side. The elevation of the Embrass River floodplain is at 156 m.

Prior to European settlement, the site now referred to as Green Glacial Drift Hill Prairie, was located in a forested corridor along Range Creek (Figure 1). An expansive prairie covering approximately 44 km^2 (17 mi^2) was located about 0.75 km south and 1.8 km east of the site (General Land Office Field Notes Vol. 173 1820). A smaller prairie covering about 12 ha (30 acres) was located in the forested corridor about 0.6 km (0.36 mile) east of the site. In the modern landscape, narrow forested corridors occur on the slopes north and south of the prairie. The surrounding upland and bottomlands are used for row crop agriculture.

Prior to implementation of management in 1997, *Andropogon gerardii* (big blue stem) was the most abundant taxon while *Schizachyrium scoparium* (little blue stem) occurred on areas where topsoil was eroded. Forb diversity was low and small diameter (5–15 cm [2–6 inch]) *Juniperus virginaina* (eastern red cedar), *Quercus imbricaria* (shingle oak), *Sassafras albidum* (sassafras) and *Diospyros virginiana* (persimmon) were scattered throughout the prairie. *Corylus americanus* (hazelnut), *Sassafra*s, and *Rhus glabra* (smooth sumac) had colonized two small ravines near the center of the prairie. *Elaeagnus umbellata* (autumn olive), *Lonicera japonica* (Japanese honey suckle) and *Sassafra*s had

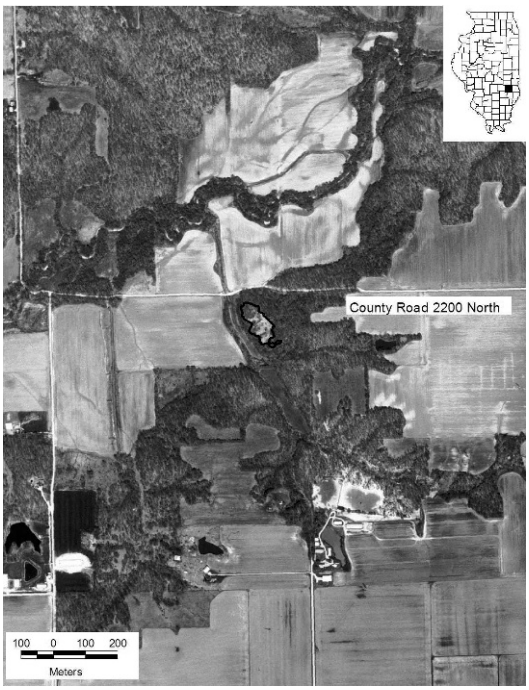


Figure 1. Aerial photograph showing the location and size of Green Prairie, Jasper County, Illinois. Inset shows the location of Jasper County in Illinois.

invaded the northern and eastern sides of the prairie. Mature *Quercus* spp. (oak) and *Carya* spp. (hickory) forest with a dense *Sassafra*s understory encircled the base of the south and southwest slopes. The west slope was *Quercus-Carya* forest with a *Carya* understory.

Management on Green Glacial Drift Hill Prairie was initiated in 1997 with the removal of woody species from the core area. Subsequent efforts have focused on control of *Elaeagnus umbellata*, *Lonicera japonica* and *Sassafras* on the periphery of the prairie. *Sassafras* and *Carya* were thinned from the forest understory on the southwest and west slopes to restore an open woodland structure. Prescribed burning was conducted in March of 1997, 1999, 2000, 2003, 2004, 2006, and 2009. The site is owned by the Green family, is included on the Illinois Natural Areas Inventory as a Grade B glacial drift hill prairie, and is enrolled in the Illinois Nature Preserves Commission's Natural Heritage Landmark program.

MATERIALS AND METHODS

Observations to determine the vascular flora of the prairie and adjacent open woodland were made periodically during the 2008 and 2009 growing seasons. Voucher specimens were collected for most observed taxa and deposited in the Stover-Ebinger Herbarium at Eastern Illinois University in Charleston (EIU).

Table 1: Taxa, frequency (%), mean cover (%), relative frequency, relative cover and importance value for taxa encountered during September 24, 2008 sampling of Green Prairie, Jasper County, Illinois. * indicates non-native species.

Species	Frequency (%)	Mean Cover (%)	Relative Frequency	Relative Cover	IV
Andropogon gerardii	100.0	25.6	7.6	22.7	15.1
Solidago nemoralis	98.0	14.4	7.3	12.8	10.1
Potentilla simplex	92.0	8.7	6.9	7.6	7.2
Pycnanthemum tenuifolium	82.0	6.6	6.1	5.9	6.0
Dichanthelium acuminatum	78.0	6.1	5.8	5.4	5.6
Carex pennsylvanica	72.0	6.2	5.4	5.5	5.4
Carex hirsutella	60.0	7.1	4.5	6.2	5.4
Rosa carolina	68.0	2.7	5.1	2.4	3.7
Liatris pycnostachya	32.0	3.7	2.4	3.3	2.8
Rubus flagellaris	38.0	3.0	2.8	2.7	2.8
Desmodium marilandicum	34.0	2.3	2.5	2.0	2.2
Carex gravida	38.0	1.3	2.8	1.2	2.0
Parthenium integrifolium	20.0	2.4	1.5	2.1	1.8
Baptisia alba	20.0	2.0	1.5	1.8	1.7
Aster praealtus	22.0	1.7	1.6	1.5	1.6
Symphoriocarpus orbiculata	24.0	1.3	1.8	1.2	1.5
Eryngium yuccifolium	16.0	1.7	1.2	1.5	1.4
Pycnanthemum pilosum	22.0	1.1	1.6	1.0	1.3
Rudbeckia hirta	30.0	0.4	2.2	0.4	1.3
Campsis radicans	26.0	0.7	1.9	0.6	1.3
Coreopsis tripteris	14.0	1.7	1.1	1.5	1.3
Monarda fistulosa	20.0	0.9	1.5	0.8	1.2
Sassafras albidum	22.0	0.5	1.6	0.4	1.0
Solidago speciosa	10.0	1.1	0.7	1.0	0.9
Chamaechrista fasciculata	20.0	0.2	1.5	0.2	0.8
Echinacea purpurea	14.0	0.6	1.0	0.5	0.8
Ratibida pinnatifida	12.0	0.8	0.9	0.7	0.8
Euphorbia corollata	18.0	0.1	1.3	0.1	0.7
Zizia aurea	12.0	0.6	0.9	0.5	0.7
**Achillea millefolium*	16.0	0.2	1.2	0.2	0.7
Lespedesa virginica	12.0	0.5	0.9	0.4	0.6
Desmodium sessilifolium	10.0	0.6	0.7	0.5	0.6
Virburnum prunifolia	12.0	0.3	0.9	0.3	0.6
Linum medium	14.0	0.1	1.0	0.1	0.5
Solidago juncea	6.0	0.7	0.4	0.6	0.5
Coreopsis palmata	8.0	0.5	0.6	0.4	0.5
Lysimachia ciliata	8.0	0.4	0.6	0.4	0.5
Carex bushii	10.0	0.2	0.7	0.2	0.5
Echinacea pallida	6.0	0.4	0.4	0.4	0.4
Lespedesa violacea	10.0	0.1	0.7	0.1	0.4
Oxalis stricta	10.0	0.1	0.7	0.1	0.4
Desmodium cuspidata	8.0	0.2	0.6	0.2	0.4
Heliopsis helianthoides	8.0	0.1	0.6	0.1	0.4
Aster laevis	8.0	0.1	0.6	0.1	0.4
Silphium terebinthinaceum	4.0	0.4	0.3	0.4	0.4
Solidago canadensis	6.0	0.2	0.4	0.2	0.3
Rhus glabra	6.0	0.1	0.4	0.1	0.3
Prunus serotina	6.0	0.1	0.4	0.1	0.3
Quercus velutina	2.0	0.3	0.1	0.3	0.2

Table 1: Continued.

Species	Frequency (%)	Mean Cover (%)	Relative Frequency	Relative Cover	IV
Solidago rigida	2.0	0.3	0.1	0.3	0.2
Diospyros virginiana	4.0	0.1	0.3	0.1	0.2
**Poa pratensis*	4.0	0.1	0.3	0.1	0.2
Schizachyrium scoparium	4.0	0.1	0.3	0.1	0.2
Aster pilosa	4.0	0.1	0.3	0.1	0.2
**Kummerowia striata*	4.0	0.0	0.3	0.0	0.2
Polygala verticillata	4.0	0.0	0.3	0.0	0.1
Strophostyles leiosperma	4.0	0.0	0.3	0.0	0.1
Antennaria plantaginifolia	2.0	0.1	0.2	0.1	0.1
Penstemon digitalis	2.0	0.1	0.2	0.1	0.1
**Poa compressa*	2.0	0.1	0.2	0.1	0.1
Quercus imbricaria	2.0	0.1	0.2	0.1	0.1
Sanicula canadensis	2.0	0.1	0.2	0.1	0.1
Vitis aestivalis	2.0	0.1	0.2	0.1	0.1
Carex glaucodea	2.0	0.0	0.2	0.0	0.1
Cirsium altissimum	2.0	0.0	0.2	0.0	0.1
Fraxinus amerianca	2.0	0.0	0.2	0.0	0.1
Lactuca candensis	2.0	0.0	0.2	0.0	0.1
Liatris aspera	2.0	0.0	0.2	0.0	0.1
Phystostegia virginiana	2.0	0.0	0.2	0.0	0.1
Prunus americana	2.0	0.0	0.2	0.0	0.1
	1340.0	112.4	100.0	100.0	100.0
Combined bare ground & litter			9.5		

Stratified quantitative sampling was conducted on September 24, 2008. Two 25-meter transect lines were randomly located parallel to the slope in the upper and lower sections of the prairie. Twenty five quadrats (1 m^2) were located at one meter intervals on alternating sides of each transect line. Odd numbered quadrats were located on the south side of the lines; even numbered quadrats on the north. A random numbers table was used to determine the number of meters each quadrat was located from the transect line. Percent cover of each species rooted within the quadrat was determined using the Daubenmire cover class system (Daubenmire 1959) as modified by Bailey and Poulton (1968). The modified cover class scale is as follows: class 1 = 0–1%; class 2 = 1–5%; class 3 = 5–25%; class 4 = 25–50%; class 5 = 50–75%; class 6 = 75–95%; class 7 = 95–100%. From these data, frequency (%), mean cover (%), relative frequency, relative cover, and Importance Value [relative frequency + relative cover)/2] were determined. The Floristic Quality Index (FQI) was determined using the coefficient of conservatism (CC) assigned to each species by Taft et al. (1997). As used here, the FQI is a weighted index of species richness (N) and is the arithmetic product of the mean coefficient of conservatism (C-value), multiplied by the square root of native species richness ($\sqrt{N}$) of the site [FQI = C-value ($\sqrt{N}$)].

RESULTS

A total of 179 taxa representing 57 families and 125 genera were observed at Green Glacial Drift Hill Prairie (Appendix). Ferns and gymnosperms were represented by five taxa in four families and four genera. Of the remaining taxa, 146 were dicots in 46 families and 121 genera and 28 were monocots in 7 families and 17 genera. Families with the greatest number of taxa were the Asteraceae (45 taxa), Rosaceae (15), Poaceae (14), Fabaceae (13) and Cyperaceae (8). Of these taxa, 28 were woody species and 15 were non-native. Of the non-native species, *Taraxacum officinale* (dandelion), *Tragopogon dubius* (yellow salsify) and *Barbarea vulgaris* var. *arcuata* (yellow rocket) were represented by a single individual following a prescribed burn in March 2009. The mean C-value and FQI for all species were 3.65 and 46.3, respectively, with six species, *Amorpha canescens*, *Aster laevis*, *Dalea candida*, *Dalea purpurea*, *Eupatorium sessilifolium*, *Parthenium integrifolium*, having a CC ≥ 8. When considering only native species, the C-value and FQI were 3.98 and 50.1, respectively.

A total of 70 species were encountered during quantitative sampling (Table 1). Species richness averaged 13.1 species/quadrat. *Andropogon gerardii* had the highest importance value (IV = 15.1), a mean cover of 25.6% and occurred in all of the quadrats. *Solidago nemoralis* (gray goldenrod) was second in importance value (10.1), had a mean cover of 14.4% and occurred in 98% quadrats. Other species with importance values > 5.0 included *Potentilla simplex* (common cinquefoil), *Pycnanthemum tenuifolium* (slender mountain mint), *Dichanthelium acuminatum* (panic grass), *Carex pennsylvanica* (Pennsylvania sedge) and *Carex hirsutella* (fuzzy sedge). *Schizachyrium scoparium* (little bluestem) occurred in only 4.0% of the quadrats and had an importance value of 0.2.

Of the remaining taxa encountered in sampling, 13 were native trees, shrubs or woody vines (Table 1). *Rosa carolina* (Carolina rose) was the most common occurring in 68% of the quadrats and ranking eighth in importance value. *Rubus flagellaris* (dewberry), *Symphoricarpos orbiculatus* (coralberry), *Campsis radicans* (trumpet creeper) and *Sassafras albidum* were the only woody taxa with IV's greater than 1.0.

Only four non-native taxa, *Achillea millefolium* (yarrow), *Poa pratensis* (Kentucky bluegrass), *Kummerowia striata* (Japanese clover) and *Poa compressa* (Canada bluegrass), were encountered during sampling (Table 1). Of these taxa, only *Achillea millefolium* had an IV greater than 1.0. The remainder occurred in four percent of the quadrats or fewer and had IV's of 0.20 or less. Bare ground and litter had a combined average cover of 9.5%.

DISCUSSION

The glacial drift hill prairies of south-central and east-central Illinois share many characteristics. They occur on south to southwest-facing slopes that have moderate to steep, well-drained soils and low nutrient and organic matter content (Vestal 1918, Ebinger 1981, McClain et al. 2002, Owens and Cole 2003, Owens and Ebinger 2008). They are all relatively small, usually 1 ha or less in size, possess similar floristic composition and contain a fair number of native prairie forbs. Green prairie compares favorably with these examples.

McClain et al. (2002) reported a total of 159 vascular plant taxa from four glacial drift hill prairies in Macoupin County. Species richness ranged from 95 to 114 species. The mean C-value for all species observed on each of the sites ranged from 3.9 to 4.2 while the FQI for all species ranged from 38.0 to 44.8. As with Green Glacial Drift Hill Prairie, those prairies, also on Illinoian-age till, were located in dissected areas with eroded Hickory silt loam soils on slopes of 18–35%. Among the grasses, *Andropogon gerardii* and *Schizachyrium scoparium* ranked first and second in importance value, each species ranking first on two sites. *Sorghastrum nutans* was reported as only a minor component in two of the prairies and not reported for the others. At these sites, the combined average cover for bare ground and litter ranged from 10.94% to 33.58%.

Owens et al. (2006) reported a total of 164 vascular plant taxa from the 1.2 ha Coneflower Glacial Drift Hill Prairie, Moultrie County. This prairie also occurs on slopes of 18–35% with eroded, well-drained Miami silt loam soils that are slightly acidic and have low organic content. Although now located along the shore of Lake Shelbyville formed by damming of the Kaskaskia River, historically the prairie was located about one quarter mile from the river. *Andropogon gerardii* was the dominant grass with an importance value of 21.2. *Schizachyrium scoparium* ranked second among the grasses with an IV of 5.3 and *Sorghastrum nutans* was not reported from the site. When all species were considered, the mean C-value was 3.07 and the FQI was 38.8.

Windfall Prairie is about 1 ha in size and located on a steep southwest-facing hillside overlooking the Vermilion River (Ebinger 1981). During a 1977 study, the prairie consisted of a series of isolated pockets that stretched for about 300 m near the top of the bluff. Ebinger (1981) conducted quantitative sampling in one of the easternmost openings that was about 35 m long and 20 m wide. He encountered 34 vascular plant taxa in the 40 0.125 m^2 circular plots. The most abundant grasses were *Sorghastrum nutans*, *Bouteloua curtinpendula* and *Schizachyrium scoparium* with IV's of 14.8, 5.2 and 3.5 out of a possible 100.0, respectively. *Andropogon gerardii* was not encountered. Brush removal and prescribed burning have increased the size of the prairie and increased species diversity. Owens and Ebinger (2008) reported a total of 107 taxa having a mean C-value of 4.03 and a FQI of 41.9 when all taxa were considered. *Schizachyrium scoparium*, *Sorghastrum nutans* and *Bouteloua curtinpendula* (side-oats grama) continued to be the dominant grasses with IV's of 12.3, 11.5 and 10.2, respectively. *Andropogon gerardii* was included in the vascular flora inventory but must have had an IV < 0.7 as it was not assigned an importance value in the reported results. Bare ground and litter had a combined average cover 27.3%.

While the glacial drift hill prairies of central and east-central Illinois share many characteristics, there do appear to be slight differences, particularly in abundance of some grass species. *Andropogon gerardii* was the dominant grass at Green Glacial Drift Hill Prairie, Coneflower Glacial Drift Hill Prairie in Moultrie County and Beaver Dam State Park site in Macoupin County. *Schizachyrium scoparium* was the dominant grass Humphries Farm North and Humphries Farm South in Macoupin County and was a

co-dominant with *Sorghastrum nutans* and *Bouteloua curtinpendula* at Windfall Prairie in Vermilion County. *Sorghastum nutans* was the dominant grass at Waterworks Hill Prairie in Coles County, but was not reported from Green Glacial Drift Hill Prairie, Coneflower Hill Prairie, Beaver Dam State Park or Humphries Farm North. These differences are likely attributed to a number of possibly interrelated factors that may include biological characteristics of the grasses, edaphic characteristics of the site, slope, aspect, their position relative to pre-European settlement vegetation patterns and fire regime.

Schizachyrium scoparium is a sun-loving, early to mid-successional, cespitose species that is usually associated with drier sites and poorer soils compared to *Andropogon gerardii* and *Sorghastrum nutans* (Steinberg 2002). It tends to decrease with succession. *Sorghastrum nutans* readily invades disturbed, bare soil areas, but can persist once established (Walkup 1991). *Andropon gerardii*, is a rhizomatous grass that can dominate a prairie due to its rapid growth and tall stature, particularly on sites where soil moisture is not limiting (Uchytil 1988).

Hill prairies are sometimes described as local inclusions of prairie in forested areas. This statement is applicable to sites, such as Green Prairie, Waterworks Prairie, and Windfall Prairie that are near historic forest-prairie interfaces. However, it may not be applicable to all sites. Some are likely the last vestige of larger prairies. Coneflower Hill Prairie is located near the south end of what was once a prairie that was about 2 km long and about 0.5 km wide (General Land Office Field Notes Vol. 183 1821). In Macoupin County, the Humphries Farm Prairies are at the south end of what was once a prairie that was 8 km wide and 7 km long (General Land Office Field Notes Vol. 93 1818). Roderick Prairie is located in dissected terrain near the center of a 5.5 km long and 1.3 km wide area that was described as being mostly prairie with patches of *Quercus stellata* (post oak) and *Corylus americana* (hazelnut). The prairie at Beaver Dam State Park is located in what was the forest-prairie interface on the east side of that prairie.

Historically, the combination of sloping, well-drained, low-nutrient soils combined with the drying effects of the southerly exposure and fires that swept across the prairies or burned through the forests slowed woody encroachment. Following European settlement, clearing of land for agriculture and fire suppression reduced the size these areas, fragmented the landscape, and hastened woody encroachment. In the absence of fire, edaphic factors and slope aspect alone were not sufficient to maintain the prairies and the rate of woody encroachment increased rapidly (Behnke and Ebinger 1989, Robertson 1996, Nicholas and Owens 2003). As a result, many glacial drift hill prairies have been lost (Behnke and Ebinger 1989, Nicholas and Owens 2003). Others have continued to experience significant decreases in size despite management efforts that include woody control and prescribed burning (Robertson 1996). However, the results of this study and those reported from Windfall Prairie and Coneflower Glacial Drift Hill Prairie provide evidence that, given consistent management and sufficient time, restoration is possible.

LITERATURE CITED

Bailey, A. W. and C. E. Poulton. 1968. Plant communities and environmental relationships in a portion of Tillamook burn, northwestern Oregon. Ecology 49:1–13.

Behnke, G. and J. E. Ebinger. 1989. Woody invasion of glacial drift hill prairies in east-central Illinois. Transactions of the Illinois State Academy of Science 82:1–4.

Bramstedt, M. W. 1992. Soil survey of Jasper County, Illinois. United States Department of Agriculture, Natural resource Conservation Service, Washington, D.C.

Daubenmire, R. 1959. A canopy coverage method of vegetation analysis. Northwest Science 33:43–64.

Ebinger, J. E. 1981. Vegetation of glacial drift hill prairies in east-central Illinois. Castanea 46:115–121.

Evers, R. A. 1955. Hill prairies of Illinois. Bulletin of the Illinois Natural History Survey 26:367–446.

Fehrenbacher, J. B. and R. T. Odell. 1956. Lawrence County Soils. Soil report 78. University of Illinois Agricultural Experiment Station, Urbana, Illinois.

General Land Office Field Notes Vol. 93. 1818. Illinois State Archives, Springfield.

General Land Office Field Notes Vol. 173. 1820. Illinois State Archives, Springfield.

General Land Office Field Notes Vol. 183. 1821. Illinois State Archives, Springfield.

Illinois State Water Survey. 2007. University of Illinois, Champaign, IL, Website (www.isws.illinois.edu/atmos/statecli/Summary/116159.htm). Accessed September 23, 2009.

McClain, W. E., M. A. Phipps, H. H. Eilers, and J. E. Ebinger. 2002. Vascular plants of glacial drift prairies in Macoupin County, Illinois. Castanea 67:54–60.

Owens, N. L. and G. N. Cole. 2003. 25 years of vegetation change in a glacial drift hill prairie community in east-central Illinois. Transactions of the Illinois State Academy of Science 96:265–269.

Owens, N. L. and J. E. Ebinger. 2008. Windfall Glacial Drift Hill Prairie, Vermilion County, Illinois: Present vegetation and changes since 1977. Trans-

actions of the Illinois State Academy of Science 101:157–165.
Owens, N. L., G. C. Tucker, and J. E. Ebinger. 2006. Flora and vegetation of Coneflower Glacial Drift Hill Prairie Natural Area, Moultrie County, Illinois. Rhodora 108:370–386.
Reeves, J. T., U. D. Zimmerman, and J. E. Ebinger. 1978. Microclimatic and soil differences between hill prairies and adjacent forests in east-central Illinois. Transactions of the Illinois State Academy of Science 71:156–164.
Robertson, K. R., M. W. Schwartz, J. W. Olson, B. K. Dunphy, and H. D. Clarke. 1996. 50 years of change in Illinois hill prairies. Erigenia 14:41–52.
Schwegman, J. E., M. Hutchison, G. Paulson, G. B. Fell, W. M. Shepherd, and J. White. 1973. Comprehensive plan for the Illinois Nature Preserves Commission: part 2. The Natural Divisions of Illinois. Illinois Nature Preserves Commission, Rockford, Illinois.
Steinberg, Peter D. 2002. *Schizachyrium scoparium*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2009, September 24].
Taft, J. B., G. S. Wilhelm, D. M. Ladd, and L. A. Masters. 1997. Floristic quality assessment for vegetation in Illinois, a method for assessing vegetation integrity. Erigenia 15:1–95.
Uchytil, Ronald J. 1988. *Andropogon gerardii*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2009, September 24].
Vestal, A. G. 1918. Local inclusions of prairie within forest. Transactions of the Illinois State Academy of Science 11:12–126.
Walkup, Crystal J. 1991. *Sorghastrum nutans*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2009, September 24].

APPENDIX

Vascular plant taxa encountered at Green Prairie, Japer County, Illinois. Non-native taxa are preceded with an asterisk (Mohlenbrock 2002, Taft et al. 1997). Nomenclature follows Mohlenbrock (2002). Distribution by vegetation type is provided: hill prairie (HP) and open woodland (OW). Collection numbers are those of Edgin.

ASPLENIACEAE
Asplenium platyneuron (L.) Oakes var. *platyneuron*; HP, OW; E6372

DRYOPTERIDACEAE
Cystopteris protrusa (Weatherby) Blasdell; OW; E6393

OPHIOGLOSSACEAE
Botrychium dissectum Spreng. var. *dissectum*; HP; E6547
Botrychium dissectum Spreng. var. *obliquum* (Muhl.) Clute; HP, E6546

CUPRESSACEAE
Juniperus virginiana L.; HP, OW; E6274

ANACARDIACEAE
Rhus glabra L.; HP; E6378
Toxicodendron radicans (L.) Kuntze var. *radicans*; HP, OW; E6411

APIACEAE
Eryngium yuccifolium Michx.; HP; E6260
Sanicula canadensis L. var. *canadensis*; HP, OW; E6569
Zizia aurea (L.) Koch; HP, E6378

APOCYNACEAE
Apocynum cannabinum L.; HP, E6450

ARISTOLOCHIACEAE
Aristolochia serpentaria L.; OW; E6557

ASCLEPIADACEAE
Asclepias purpurascens L.; HP; E6387

ASTERACEAE
**Achillea millefolium* L. var. *millefolium*; HP; E6388
Ageratina altissima (L.) R. M. King & H. Robins.; OW; E6288
Ambrosia artemisiifolia L.; HP, OW; E6566
Antennaria plantaginifolia Greene; HP; E6619
Aster laevis L.; HP; E6581
Aster novae-angilea L.; HP; E6258
Aster pilosus Willd.; HP, OW; E6582
Aster praealtus Poir.; HP; E6583
Aster sagittifolius Willd.; OW; E6255
Cirsium altissimum (L.) Spreng.; HP, OW; E6284
Cirsium discolor (Muhl.) Spreng.; HP:
Coreopsis tripteris L. var. *deamii* Standl.; E6259
Echinacea pallida (nutt.) Nutt.; HP
Echinacea purpurea (L.) Moench.; HP, OW; E6280
Erigeron annuus (L.) Pers.; HP, OW; E6384
Erigeron strigosus Muhl.; OW; E6459
Eupatorium altissimum L.; HP, OW; E6262
Eupatorium perfoliatum L.; HP; E6271

Eupatorium sessilifolium L. var. *brittonianum* Porter; OW; E6276
Euthamia graminifolia (L.) Nutt.; HP; E6545
Helianthus divaricatus L.; HP, OW; E6509
Heliopsis helianthoides (L.) Sweet var. *scabra* (Dunal) Fern.; HP, OW; E6286
Hieracium longipilum Torr.; HP; E6250
Lactuca canadensis L. var. *canadensis*; HP; E6269
Lactuca floridana (L.) Gaertn. var. *villosa* (Jacq.) Cronq.; OW; E6285
Liatris aspera Michx.; HP; E6264
Liatris pycnostachya Michx.; HP, OW; E6453
Oligoneuron rigidum (L.) Small var. *humile* (T.C. Porter) Nesom.; HP; E6252
Parthenium integrifolium L.; HP;E6374
Ratibida pinnata (Vent.) Barnh.; HP; E6457
Rudbeckia hirta L. var. hirta; HP, OW; E6386
Rudbeckia subtomentosa Pursh.; HP; E6559
Rudbeckia triloba L.; OW; E6272
Silphium laciniatum L. var. *laciniatum*; HP; E6580
Silphium perfoliatum L.; OW; E6565
Silphium terebinthinaceum Jacq. var. *terebinthinaceum*; HP; E6579
Solidago canadensis L. var. *gilvocanescens* Rydb.; HP; OW; E6273
Solidago juncea Ait. f. *juncea*; HP; E6460
Solidago nemoralis Ait.; HP, OW; E6256
Solidago speciosa Nutt. var. *jejunifolia* (Steele) Cronq.; HP; E6253
Solidago ulmifolia Muhl.; OW; E6290
**Taracum officinale* Weber; HP; E6616
**Tragopogon dubius* Scop.; HP; E6402
Vernonia gigantea (Walt.) Trel. var. *taeniotricha* Blake.; HP; E6275
Vernonia missurica Raf.; HP; E6270

BERBERIDACEAE
Podophyllum peltatum L.; OW; E6621

BIGNONIACEAE
Campis radicans (L.) Seem; HP, OW; E6448

BRASSICACEAE
**Barbarea vulgaris* R. Br. Var. arcuata; HP; E6611

CAESALPINIACEAE
Cercis canadensis L.; OW; E6449
Chamaechrista fasciculata (Michx.) Greene var. *fasciculata*; HP, OW; E6279
Gleditsia triacanthos L. f. *triacanthos*; OW; E6551

CAMPANULACEAE
Campanulastrum americanum (L.) Small var. *americanum*; OW; E6567
Lobelia inflata L.; HP; E6552
Triodanis perfoliata (L.) Nieuwl.; HP; E6380

CANNABINACEAE
Humulus lupulus L. var. *lupuloides* E. Small; OW; E6389

CAPRIFOLIACEAE
**Lonicera japonica* Thunb. var. japonica; HP, OW; E6382
Symphoricarpos orbiculatus Moench; HP, OW; E6573
**Viburnum dentatum* L. var. *deamii* (Rehd.) Fern.; HP, E6287
Viburnum prunifolium L.; HP, OW; E6610

CARYOPHYLLACEAE
**Dianthus armeria* L.; HP; E6265
Silene stellata (L.) Ait. f. var. *scabrella* (Nienwl.) Palmer & Styerm.; OW; E6291

CELASTRACEAE
Celastrus scandens L.; HP, OW; E6391

CISTACEAE
Lechea tenuifolia Michx. var. *tenuifolia*; HP

CONVOLVULACEAE
Calystegia sepium (L.) R. Br. ssp. *americanum* (Sims.) Brummitt.; HP, OW; E6550

CORYLACEAE
Corylus americana Walt.; HP, OW; E6277

EBENACEAE
Diospyros virginiana L. var. *pubescens* (Pursh) Dippel; HP, OW; E6556

ELAEAGNACEAE
**Elaeagnus umbellata* Thunb.; HP; OW; E6617

EUPHORBIACEAE
Acalypha gracilens Gray; HP, E6577
Euphorbia corollata L. var. *mollis* Millsp.; HP; E6261

FABACEAE
Amorpha canescens Pursh.; HP; E6373
Apios americana Medic.; OW;
Baptisia alba (L.) Vent. var. *macrophylla* (Larisey) Isley; HP; E6268
Dalea candida (Michx.) Willd.; HP; E6454
Dalea purpurea Vent.; HP; E6251
Desmodium cuspidatum (Muhl.) Loud. var. *longifolium* (Torr. & Gray) B.G. Schub; HP; E6574
Desmodium marilandicum (L.) DC.; HP; E6562
Desmodium sessilifolium (Torr.) Torr. & Gray; HP; E6267
**Kummerowia striata* (Thunb.) Schind.; HP
Lespedesa virginica (L.) Britt.; HP; E6257
Lespedeza violacea (L.) Pers.; HP; E6295
**Melilotus albus* Medic.; HP; E6456

Strophostyles leiosperma (Torr. & Gray) Piper; HP; E6558

FAGACEAE
Quercus alba L.; OW; E6571
Quercus imbricaria Michx.; HP, OW; E6248
Quercus muehlenbergii Engelm.; OW; E6553
Quercus palustris Muench.; HP, OW;
Quercus stellata Wangh.; OW
Quercus vetulina Lam. f. var. *velutina*; OW; E6572

GENTIANACEAE
Sabatia angulatus (L.) Pursh.; HP; E6554

HYPERICACEAE
Hypericum punctatum Lam.; HP; E6452

JUGLANDACEAE
Carya ovalis (Wangenh.) Sarg.; OW; E6543
Carya ovata (Mill.) K. Koch var. *ovata*; HP, OW; E6576
Carya tomentosa (Poir.) Nutt.; OW;
Juglans nigra L.; HP, OW; E6575

LAMIACEAE
Monarda fistulosa L. var. *mollis* (L.) Benth.; HP; E6294
Physostegia virginiana (L.) Benth.; HP; E6254
**Prunella vulgaris* L. var. *vulgaris*; HP; E6455
Pycnanthemum pilosum Nutt.; OW; E6293
Pycnanthemum tenuifolium Schrad.; HP; E6266

LAURACEAE
Sassafras albidum (Nutt.) Nees; HP; OW; E6564

LINACEAE
Linum medium (Planch.) Britt. var. *texanum* (Planch.) Fern.; HP; E6376

OLEACEAE
Fraxinus americana L.

OXALIDACEAE
Oxalis stricta L.; HP, OW; E6377
Oxalis violacea L.; OW; E6620

PHRYMACEAE
Phryma leptostachya L.; OW; E6283

POLEMONIACEAE
Phlox divaricata L. spp. *laphamii* (Wood) Wherry; OW; E6625

POLYGALACEAE
Polygala verticillata L. var. *isocycla* Fern.; HP; E6409

POLYGONACEAE
Antenoron virginiamum (L.) Roberty & Vautier; HP, OW; E6561

PORTULACACEAE
Claytonia virginica L.; OW; E6624

PRIMULACEAE
Lysimachia ciliata L.; HP; E6399

RANUNCULACEAE
Anemone virginiana L.; OW; E6292
Hydrastis canadensis L.; OW; E6614
Ranunculus abortivus L. var. *abortivus*; HP, OW; E6612

ROSACEAE
Agrimonia pubescens Wallr.; OW; E6548
Crataegus pruinosa (Wendl.) K. Koch.; OW; E6549
Fragaria virginiana Duchesze; HP; E6370
Geum canadense Jacq. var. *canadense*; OW; E6458
Geum vernuum (Raf.) Torr. & Gray; OW; E6613
Porteranthus stipulatus; OW
Potentilla simplex Michx. var. *simplex*; HP; E6397
Prunus americana Marsh.; HP
Prunus serotina Ehrh.; OW; HP; E6560
Rosa carolina L. var. *carolina*; HP, OW; E6395
Rosa multiflora Thunb.; HP, OW; E6451
Rosa setigera Michx. var. *setigera*; E6398
Rubus allegheniensis Porter; HP; E6544
Rubus flagellaris Willd.; HP, OW; E6396
Rubus occidentalis L.; HP, OW; E6383

RUBIACEAE
Galium aparine L. var. *aparin*; HP
Galium circaezans Michx. var. *hypomaculatcum* Fern.; OW; E6390
Galium triflorum Michx.; HP; E6578

SALICACEAE
Salix humilis Marsh. var. *humilis*; HP

SAXIFRAGACEAE
Heuchera americana L. var. hirsuticaulis (Wheelock) Rosend.; OW;

SCROPHULARIACEAE
Penstemon digitalis Nutt.; HP; E6289
Veronicastrum virginicum (L.) Farw. f. *virginicum*; HP, OW; E6508

ULMACEAE
Ulmus rubra Muhl.; HP, OW;

VIOLACEAE
Viola sororia Willd.; HP; E6622

VITACEAE
Vitis aestivalis Michx. var. *aestivalis*; HP, OW; E6568

COMMELINACEAE
Tradescantia ohiensis Raf.; HP; E6381
Tradescantia virginiana L.; OW; E6626

CYPERACEAE
Carex blanda Dewey; HP; E6628
Carex bushii Mack.; HP; E6406
Carex cephalophora Muhl.; HP; 6665
Carex glaucodea Tuckerm.; HP; OW
Carex gravida L. H. Bailey; HP; E6404
Carex hirsutella Mack.; HP; E6403
Carex pennsylvanica Lam.; HP, OW; E6627
Scirpus pendulus Muhl.; HP; E6408

DIOSCOREACEAE
Dioscorea quaternata (Walt.) T. F, Gmel. var. *quaternata*; HP, OW; E6392

JUNCACEAE
Juncus secundus Beauv.; HP; E6405

LILIACEAE
Trillium recurvatum Beck f. *recurvatum*; OW; E6615

POACEAE
**Agrostis gigantea* Roth.; HP; E6563
Andropogon gerardii Vitman.; HP, OW; E6263
Danthonia spicata (L.) Roem. & Schultes; HP, OW; E6394
Dichanthelium acuminatum (Sw.) Gould & Clark var. *fasciculatum* (Torr) Freckm.; HP, OW; E6385
Dichanthelium clandestinum (L.) Gould and Clark; HP
Elymus hystrix L. var. *hystrix*; HP, OW; E6281
Elymus villosus Muhl. f. *villosus*; HP; E6282
Elymus virginicus L. var. *virginicus*; HP, OW; E6371
Eragrostis spectabilis (Pursh.) Steud.; HP; E6410
Leersia virginica Willd.; OW; E6555
**Poa compressa* L.; HP; E6407
**Poa pratensis* L.; HP
Schizachyrium scoparium (Michx.) Nash.; HP
Tridens flavus (L.) Hitchc. f. *flavus*; HP, OW; E6278

SMILACACEAE
Smilax tamnoides L. var. *hispida* (Muhl.) Fern.; OW

ERIGENIA, Number 23, Winter 2010, pp 34–38

ADDITIONS TO THE VOLO BOG HERBARIUM, ILLINOIS NATURE PRESERVE, LAKE COUNTY, ILLINOIS

Linda W. Curtis[1]

ABSTRACT: The Volo Bog teaching herbarium contains 90% of the approximately160 species that grow in the bog basin, with 17 of the 21 Illinois Endangered and Threatened species in the Volo Bog State Natural Area. Volo Bog Nature Preserve is one of three bogs in the Volo Bog State Natural Area that also includes Pistakee Bog State Nature Preserve and Brandenburg Bog in Lake and McHenry Counties, Illinois. The herbarium at the Volo Bog Nature Center began in 1988 with collections into 1993. The plants were taken only from along the plank walk as required by DNR and Illinois Nature Preserves Commission's permit restrictions. In 2008–09, with a new permit, seven new species were collected, totaling 147 vascular plants from the bog basin for the herbarium.

INTRODUCTION

Volo Bog Nature Preserve's bog basin begins at the Nature Center Trail at N42 21.063 W88 11.2275, elevation 738 feet, in Lake County, NE ¼ Section 28, T.45 N., R.9 E. Originally purchased as a 43 acre tract, the long bog depression with an open pond is nearly north to south in orientation between two till ridges.

Figure 1. Locator map.

Figure 2. Aerial photo of Volo Bog.

METHODS

The Volo Bog herbarium is a valuable teaching aid to researchers, educators and visitors. However, as an Illinois Nature Preserve, no plants or animals may be taken without approval and a permit from the DNR and Illinois Nature Preserves Commission, A permit was first granted in 1988 from the Department of Conservation Division of Natural Heritage and Illinois Nature Preserves Commission for collection of plants along the plank walk for the Volo Bog Nature Center teaching herbarium with duplicates sent to the Illinois State Museum. Permission was again granted to the author as herbarium coordinator for 2008–09 to add plants previously not found along the plank walk. The permit again specified aerial parts taken only, no roots, so impact was minimal.

[1] Volo Bog Herbarium Coordinator, Curtis to the Third, P.O. Box 731, Lake Villa, Illinois 60046.

RESULTS

Seven additional species were added to the inventory. They included *Aralia nudicaulis*, *Calla palustris*, *Carex bebbii*, *Liparis loeselii*, *Lysimachia terrestris*, *Trientalis boreali*, and one sedge new to Lake County, *Carex diandrus*, (confirmed by Paul Rothrock of Taylor University). Repeat specimens in mature stages were taken of *Larix laricina*, *Sarracenia purpurea*, *Carex interior*, *Schoenoplectus smithii* var. *setosus*, and *Utricularia vulgaris*.

REFERENCES

Illinois Department of Natural Resources. 2004. Comprehensive Site Inventory Volo Bog State Natural Area (unpublished data). Lake and McHenry Counties, District 7, Chain O'Lakes, Illinois.

Illinois Endangered Species Protection Board. 2005. Checklist of Endangered and Threatened Animals and Plants of Illinois. Illinois Endangered Species Protection Board, Springfield, Illinois. 16 pp.

ILLS. 2009. Illinois Natural History Survey Herbarium (ILLS) Database. Data base of collections in the herbarium of the Illinois Natural History Survey, Institute of Natural Resources Sustainability at the University of Illinois, Champaign, Illinois. ellipse.inhs.uiuc.edu:591/INHSCollections/plantsearch.html.

Mastrogiuseppe, Joy, Paul E. Rothrock, A. C. Dibble, and A. A. Resnicek. Carex: Section Ovales. In Flora of North America North of Mexico 23:332–378. Oxford University Press, New York.

The vPlants Project. vPlants 2009: A Virtual Herbarium of the Chicago Region www.vplants.org

Swink, F. and G. Wilhelm. 1994. Plants of the Chicago Region. 4th edition. Indiana Academy of Science, Indianapolis. 921 pp.

Tucker, Gordon C., Brian G. Marks, and J. Richard Carter. Cyperus: subgroup Pycreus. In Flora of North America North of Mexico 23:158–163. Oxford University Press, New York.

APPENDIX 1:

Vascular plants in the Volo Bog Herbarium. Nomenclature follows Swink and Wilhelm 1994.
+ species added from along the plank walk 2008–09
*=non-native species

PTERIDOPHYTA

EQUISETACEAE
Equisetum fluviatile L.

POLYPODIACEAE
Dryopteris thelypteris (L.) A. Gray var. *pubescens* (G. Lawson) Nakai
Dryopteris cristata (L.) A. Gray
Dryopteris spinulosa (O. F. Mull.) Watt
Onaclea sensibilis L.

OSMUNDACEAE
Osmunda cinnamomea L.
Osmunda regalis L. var. *spectibilis* (Willd.) A. Gray
PINACEAE
Larix laricina (Du Roi) K. Koch

MONOCOCOTYLEDONEAE

ALISMATACEAE
Alisma subcordatum Raf.
Sagittaria latifolia Willd.

ARACEAE
Calla palustris L.

CYPERACEAE
+*Carex bebbii* (L.H. Bailey) Fern.
Carex canescens (L.) var. *disjuncta* Fern.
Carex chordorrhiza L.
Carex comosa Boott.
Carex cristatella Britton
Carex disperma Dewey
+*Carex interior* L.H.Bailey
Carex leptalea Wahlenb.
Carex lasiocarpa Ehrh.
Carex laucustris Willd.
Carex pellita Willd.
Carex scoparia Willd.
Carex stipata Willd
Carex stricta Lam.
Carex trisperma Dewey
+*Cyperus diandrus* Torr.
Cyperus erythrorhizos Muhl.
Cyperus rivularis Kunth
Dulichium arundinaceum (L.) Britton
Eleocharis acicularis (L.) Roem & Schult
Eleocharis erythropoda Steud.
Eleocharis obtusa Schult
Eriophorum virginicum L.
Schoenoplectus smithii (A.Gray) Sojak var. *setosus* (Fernald) S.G. Sm.
Schoenoplectus *tabernaemontani* - (C.C. Gmelin) Palla, Vehr
Scirpus atrovirens Willd.
Scirpus cyperinus (L.) Kunth

JUNCACEAE
Juncus acuminatus Michx.

IRIDACEAE
Iris virginia L. var. *shrevei* (Small) E.S. Anderson

LEMNACEAE
Lemna minor L.
Lemna trisulca L.
Spirodela polyrhiza (L.) Schleid.
Wolffia colombiana H. Karst
Wolffia papulifera C.h. Thomps
Wolffia punctata Griseb.

NYMPHACEAE
Nymphaea tuberosa Paine

ORCHIDACEAE
Calopogon tuberosus (L.) BSP.
Habenaria lacera - (Michx.) Lodd.
+*Liparis loeselii* (L.) Rich.
Pogonia ophioglossoides (L.) Ker Gawl.

POACEAE
**Agrostis alba* L.
Calamogrostis canadensis (Michx.) P. Beauv.
Glyceria striata (Lam.) Hitchc.
Leersia oryzoides (L.) Sw.
Panicum capillare L.
**Phalaris arundinacea* L.
Phragmites australis (communis) (Cav.) Steud.
Poa palustris L.

PONTEDERIACEAE
Pontederia cordata L.

SPARGANIACEAE
Sparganium eurycarpum Engelm.

TYPHACEAE
Typha angustifolia L.
Typha latifolia L.

ZOSTERACEAE
Potamogeton foliosus Raf.

DICOTYLEDONEAE

ACERACEAE
Acer negundo L.

APIACEAE
Cicuta bulbifera L.
Cicuta maculata L.
Sium suave Walter

AQUIFOLIACEAE
Ilex verticillata (L.) A. Gray
ARALIACEAE
+*Aralia nudicaulis* L.

ASCLEPIADACEAE
Asclepias incarnata L.

ASTERACEAE
Aster borealis Prov.
Bidens cernua L.
Bidens comosa (A.Gray) Wiegand
Bidens connata Muhl.
Biden coronata (L.) Britton
Eupatorium perfoliatum L.
Eupatorium maculatum L.
Lactuca biennis (Moench) Fern.

BALSAMINACEAE
Impatiens capensis Meerb.
Impatiens pallida Nutt.

BETULACEAE
Betula pumila L.

CAPRIFOLIACEAE
Sambucus canadensis L.

CONVOLVULACEAE
Cuscuta campestris Yunck.
Cuscuta gronovii Willd.

CORNACEAE
Cornus obliqua Raf.
Cornus stolonifera Michx.

CUCURBITACEAE
Echinocystis lobata (Michx.) T. & G.

ERICACEAE
Chamedaphne calyculata(L.) Moench var. *angustifolia* (Aiton) Rehder
Vaccinium angustifolium Aiton
Vaccinum corymbosum L.
Vaccinium macrocarpum Aiton

GENTIANACEAE
Menyanthes trifoliata L. var. *minor* Raf.

GROSSULARIACEAE
Ribes americanum Mill.

HYPERICACEAE
Hypericum virginicum L. var *fraseri* (Spach) Fern

LAMIACEAE
Lycopus americanus Muhl.

Lycopus uniflorus Michx.
Mentha arvensis L. var. *villosa* (Benth.) S.R. Stewart
Scutellaria epilobiifolia A. Ham.
Scutellaria lateriflora L.
Teucrium canadense L.

LENTIBULARIACEAE
Utricularia gibba L.
Utricularia vulgaris L.

LYTHRACEAE
**Lythrum salicaria* L.

NYMPHAEACEAE
Brasenia schreberi J.F. Gmel.

ONAGRACEAE
Epilobium coloratum Biehler
Epilobium leptophyllum Raf.
Epilobium strictum Spreng.

POLYGONACEAE
Polygonum amphibium var. *stipulaceum* N. Coleman
Polygonum lapathifolium L.
Polygonum punctatum Elliott
Polygonum saggitatum L.
**Polygonum persicaria* L.
Rumex orbiculatus A. Gray

PRIMULACEAE
+*Lysimachia terrestris* (L.) BSP
Lysimachia thyrsiflora L.
+*Trientalis borealis* Raf.

PYROLACEAE
Monotropa uniflora L.

RANUNCULACEAE
Caltha palustris L.
Ranunculus pensylvanicus L.

RHAMNACEAE
**Rhamnus frangula* L.

ROSACEAE
Aronia melanocarpa (Michx.) Rehder
Potentilla palustris (L.) Scop.
Spirea alba Du Roi

RUBIACEAE
Galium obtusum Bigelow
Galium tinctorium L.
Galium trifidum L.

SALICACEAE
Populus tremuloides Michx
Populus deltoides Marshall
Salix bebbiana Sarg.
Salix candida Flugge
Salix discolor Muhl.
Salix eriocephala Michx.
**Salix fragilis* L.
Salix pedicellaris Pursh var. *hypoglauca* Fernald
Salix petiolaris Sm.

SARRACENIACEAE
Sarracenia purpurea L.

SAXIFRAGACEAE
Penthorum sedoides L.

SCROPHULARIACEAE
Agalinis purpurea (L.) Pennell

SOLANACEAE
Solanum dulcamara L.

URTICACEA
Boehmeria cylindrica (L.) Sw.
Pilea fontana (Lunell) Rydb.

VERBENACEAE
Verbena hastata L.

VIOLACEAE
Viola pallens (Banks) Brainerd

APPENDIX 2

Illinois Listed Endangered and Threatened species in Volo Bog State Natural Area.

The Volo Bog herbarium has 17 of the 21 E/T bog species found in the Volo Bog Natural Areas as listed in the DNR Site Inventory. However, *Betula alleghaniensis*, can be seen from the floating platform at the pond. The three remaining E/T plants are the orchids *Cypripedium parviflorum makasin*, *C. reginae*, and *Utricularia intermedia* which are in Brandenburg or Pistakee Bog. *C. acaule* is believed extirpated from Volo Bog. A specimen collected in Volo Bog by Sheviak in 1968 was deposited in the University of Illinois Urbana Herbarium. (ILLS 2009).

Drosera rotundifolia, also believed extirpated, has had undocumented sightings along the plank walk growing in sphagnum in the mat.
+ = not in the Volo Bog herbarium

Endangered
+*Betula alleghaniensis*
Calla palustris
Calopogon tuberosus
Carex canescens var. *disjuncta*
Carex chordorrhiza
Carex disperma
Carex trisperma
+*Cypripedium parviflorum* var. *makasin*
+*Cypripedium reginae*
Eriophorum virginicum
Pogonia ophioglossoides
Sarracenia purpurea
Schoenoplectus smithii
Trientalis borealis
Vaccinium corymbosum
Vaccinium oxycoccos

Threatened:
Chamaedaphne calyculata
Epilobium strictum
Larix laricina
Menyanthes trifoliata
+*Utricularia intermedia*

Plate (clockwise). Image 1. *Trientalis borealis*. Image 2. *Calla palustris*. Image 3. *Sarracenia purpurea*. Image 4. *Cyperus diandrus*. Image 5. *Carex interior*. Image 6. *Liparis loeselli*.

Erigenia, Number 23, Winter 2010, pp 39–44

PERSPECTIVE

A Lifetime of Botanizing in Illinois

John E. Schwegman[1]

Exploring for and collecting Illinois' native plants, or ''botanizing'', has been an important and enjoyable part of the last 43 years of my life. I have done this as a student, a job, and a very fulfilling avocation. My search for rare and new plants was fed by the desire to understand the natural world around me and by the thrill of finding the unknown. My botanizing has resulted in the addition of 33 new native species to the known flora of Illinois and the discovery of many new introduced species. The 33 native plants include two that were new to science. Both scientific and common names used in this paper follow Mohlenbrock (2002).

As each year passes, it becomes more difficult to find plants that have been overlooked by botanists in a state as well botanized as Illinois. When I began collecting plants, the potential for finding new species was much greater than it is today. I want to take this opportunity to let the reader relive how it was back in an earlier time of plant exploration in Illinois. This paper shares with the reader the circumstances and excitement surrounding many of my plant discoveries.

I began my studies in biology as a student of Zoology at Southern Illinois University. My goal was a career in wildlife management, which I began in March of 1965 as the Wildlife Refuge Manager at Mermet Lake Conservation Area in Massac County. I had my introduction to plants when I took Botany 100 as an undergraduate at SIU. However, this class did not cover floristics and had I not met Martha, my future wife in that class, I would hardly remember taking it. I became acquainted with Dr. Robert Mohlenbrock of SIU about the time I began work at Mermet, and his enthusiasm for studying the local flora was contagious. Martha also encouraged me to learn the plants, and together they convinced me to study the local flora.

Armed with the three volume set of The New Britton and Brown Illustrated Flora (Gleason, 1963); I began learning all of the plants I could find at the Conservation Area and surrounding territory. Dr. Mohlenbrock would verify or correct my identifications as I taught myself the local flora. I learned that the key to finding new and rare species was to know the local flora well. Then when you find something you do not recognize it is worthy of collecting. I soon began finding plants that were not in the flora books for southern Illinois or even the whole state, and Bob encouraged me to begin publishing these new records. At this point I was hooked on botanizing.

As I began my botanical explorations, I soon found that the eastern end of Illinois' Cretaceous Hills (southern Pope and eastern Massac Counties) was an area that had been overlooked by plant collectors up to that time. The area was remote and largely inaccessible except by dirt Forest Service fire lanes. Luckily, I owned a four wheel drive International Scout that took me where few botanists had ventured before. My investigations revealed that the gravelly forested hills of this part of the Gulf Coastal Plain held several plants that had not previously been reported for Illinois.

The most interesting botanical habitats here are prairie-like barren communities, small gravelly streams, and acid seep springs. In June of 1965 I discovered my first state record plant here. It was Swamp Dogwood (*Cornus amomum*), a dogwood shrub that borders many of the small streams in the Cretaceous Hills (Schwegman and Mohlenbrock 1966). In 1966 I added Beard Grass (*Gymnopogon ambiguus*) to the State's flora from a barren remnant in this same region. Remarkably, I had visited Bob Mohlenbrock just a week before embarking on this exploration outing to the Burke Branch area, and he had pointed out Beard Grass as a species that might be in southern Illinois because it was in adjacent states. He was amazed to see me walk in with a Beard Grass specimen from Illinois just a few days later (Schwegman and Mohlenbrock, 1968).

I also began collecting in the Shawnee Hills in 1966 and was fascinated by the relict northern plants growing on the north-facing sandstone ledges along some of the major creeks. This relict flora included

[1] 3626 Riverpoint Lane, Metropolis, IL 62960.

club mosses (*Lycopodium sp.*), *Sphagnum* mosses, and *Gentiana spp*, among others. Lusk Creek was the most prominent of these, but Bay Creek and Hayes Creek also offered promise. As I was exploring ledges above Hayes Creek, I came upon a ledge some 7 feet long by 1 foot wide about 20 feet above the creek that was covered by a plant that was new to me. This herb formed a dense covering of low, dark green, trifoliate leaves with no sign of flowers or fruits present on October 1. However, a visit the following spring revealed the beautiful yellow blossoms of the Barren Strawberry (*Waldsteinia fragarioides*) (Schwegman and Mohlenbrock, 1968). The exotic name of *Waldsteinia* fascinated me but when I learned of the very sporadic distribution of this plant in the Midwest I was amazed that it grew here at all.

By 1967 I had completed a list of 711 vascular plants from the Mermet Conservation Area which included *Carex reniformis*, a new sedge for the state (Mohlenbrock and Schwegman, 1967). It grew in and adjacent to post oak flatwoods, one of the most interesting natural communities on the site. It is a southern species at the very northern edge of its range in Illinois.

Having finished my Mermet Lake study, I continued to collect plants in the diverse habitats of southeastern Illinois. This effort turned up 8 new native species for the state which included the two species subsequently described as new to science as well as a new orchid and fern. I also collected several introduced plants that were new to Illinois in 1967.

Four of my 10 additions to the Illinois flora in 1967 were found in or near the acid seep springs of the Cretaceous Hills. The most striking discovery here was the Whorled Pogonia Orchid (*Isotria verticillata*) (Schwegman 1968a). I had been aware that this orchid was a possible species for the region, but many trips specifically looking for it had not found it. The spring of 1967 found my wife Martha pregnant with our first son John and that limited the time I had for plant explorations. Martha just could not ride along the fire trails in the old Scout in that condition and I did not want to leave her alone for long. When son John Andrew was born June 23, I celebrated by going botanizing the next morning before visiting them at the hospital. As I was leaving one of the better seep springs I spotted a small sterile plant topped with a whorl of leaves and just snatched it up and kept going (it was a mile to the nearest road). That evening I took a critical look at the plant and was amazed to identify it as the Whorled Pogonia (Figure 1). A new son and a new orchid for Illinois in two consecutive days really put me on a high!

The other three state records from the seeps that year were the Netted Chain Fern (*Woodwardia aerolata*) (Schwegman 1968-2), Star Sedge (*Carex atlantica*, *then identified as C. incomperta*) (Mohlenbrock and Schwegman, 1967), and Screwstem (*Bartonia paniculata*) (Schwegman 1968). As it turns out, I had been walking past the Netted Chain Fern near several of the seeps I had been botanizing and just misidentified its leaves as Sensitive Fern (*Onoclea sensibilis*). In January of 1967 I was out looking for new seeps when I came across a seep with many Chain Ferns in fruit. While it's sterile leaves look like Sensitive Fern, the fruits are really distinctive and allowed me to recognize it. The Star Sedge is a regular inhabitant of many of the acid seeps I was botanizing, where it forms clumps or hummocks of long narrow leaves. It is a coastal plain species at the north edge of its range here. The tiny Screwstem, with its minute scale-like leaves and small flowers, was spotted in open ground of a seep and along the stream that drained it. Steyermark had found it in similar acid seeps in Southeast Missouri, but this was the first record of it in Illinois.

Figure 1. Whorled Pogonia Orchid (*Isotria verticillata*).

Also in 1967, the roadsides and old fields in the eastern Cretaceous Hills yielded the tall Panic Grass (*Dicanthelium scoparium*) , while on the bluffs along the Ohio River at Golconda I found Heart-leaved Goldenrod (*Solidago sphacelata*), (Schwegman, 1968).

The Goldenrod is a special case as, unknown to me at the time; it had been found and collected by Earnest Jesse Palmer during his collecting of woody plants for the Arnold Arboretum around Golconda in 1919. He published his woody plant list but apparently just deposited herbarium specimens of the herbs at Gray Herbarium at Harvard and at the Missouri Botanical Garden. Here it remained, unknown to Illinois botanists, and was not included in the Illinois Floras until I reported it.

Having a newfound interest in the flora, Martha and I purchased an 18 acre tract near the Ohio River in Massac County that we named Halesia. It contained the largest native Illinois population I knew of the Silverbell Tree (*Halesia carolina*). To my delight, the tract held other botanical jewels as well. Richard Maxwell was monographing the leguminous genus *Dioclea* for his PhD at SIU in 1967 and asked me to keep an eye out for *D. multiflora*, which was a possible new species for Illinois. When I spotted the large trifoliate leaves of a vine unknown to me at Halesia, I suspected that it was the *Dioclea*. It soon flowered and confirmed the identification (Schwegman, 1968a). In his revision of the genus, Dick transferred this taxon (Milk Pea) to *Galactia* and gave it the specific epithet *mohlenbrockii*.

In 1967 I was learning the Genus *Carex* in southern Illinois and one of the species that was common at Halesia just did not key out to anything in the book. It keyed easily to the Section Bractiosae but then to *C. rosea* which was common on the uplands there, but was notably different from this species. The unknown taxon was paler green, colonial in nature, and had very narrow perigynia. It grew on flat terraces lower in the ravine than did the *C. rosea*. I invited Dr. Mohlenbrock to view the species in the field with me and he agreed that it did not seem to fit any described species in the Northeastern Flora. We made more collections and he undertook an intensive study of the specimens resulting in our joint naming of it as the new species *Carex socialis* (Mohlenbrock and Schwegman, 1969). This taxon has been widely accepted and is now included in the Flora of North America.

While I am not generally including state record introduced plants in this paper, one I encountered in 1967 turned out to be a notable exotic invader as time has passed and is worthy of mention. In September of that year I was collecting plants with the late Dr. Robert Evers of the Illinois Natural History Survey. We were in lowlands along the Ohio River south of Bay City in Pope County when I noticed a new and attractive grass which I collected for later identification. It keyed to *Ulalia viminea* (Mohlenbrock and Schwegman, 1969) *and is* now known as *Microstegium vimineum*. This Natal Grass or Japanese Stilt Grass is now one of the most noxious weeds threatening native flora over wide areas of Southern Illinois. It is especially a threat to the acid seep spring flora.

The spring of 1968 brought a big change in my botanizing as I resigned my position at Mermet with the Department of Conservation and enrolled at Southern Illinois University in pursuit of a master's degree in botany. I selected a study of the flora of the seep springs of the eastern Cretaceous Hills as my thesis problem, but before starting field work on the springs I was hired to botanize along Lusk Creek for the spring quarter. A project was under way to dam the creek and President Morris of SIU had made funds available to document the biota of the potential lake basin before it was destroyed. I was to look especially for rare and notable plants that would be lost.

One species I encountered in this search was identified as *Oxalis grandis*, which was new to southern Illinois but not the state. My future studies, as explained later, eventually described this as a species new to the state. Another new native taxon resulting from the Lusk Creek work was the hybrid between Goldie's Fern (*Dryopteris goldiana*) and Marginal Shield Fern (*Dryopteris marginalis*). I had found a good stand of Goldie's along the creek, and mentioned to Bob Mohlenbrock that it was growing in a mixed stand with Marginal Shield. When Bob mentioned this to fern botanist Herb Wagner of the University of Michigan, Wagner replied that he was sure that the hybrid between the two, *Dryopteris x. neowherryi*, would be present. I have a fond memory of the expedition that ensued when Wagner came to Southern Illinois to show us this new fern taxon for the state. Mohlenbrock, Wagner, and I made our way along Lusk Creek from Manson Ford to the site and sure enough, Herb immediately found four of the hybrids.

At the end of the spring, I was hired as a part time Field Representative of the Illinois Nature Preserves Commission. One of my first tasks was to put together a recommendation to the Shawnee National Forest of a series of natural areas that they could set aside to protect the bulk of the natural diversity on the Forest. Three species of plants not previously known from native wild populations in Illinois were discovered during this project.

While evaluating Panther Hollow in far eastern Hardin County I collected Ravenel's Panicum (*Dicanthelium ravenelii*) (Schwegman, 1970), which was new to the State. As I worked on the description of the Burke Branch Area in southern Pope County, it was hard to miss the abundant Great Chickweed (*Stellaria pubera*) (Schwegman, 1972). While listed from Illinois, it was only known from the Chicago area based on widely disjunct populations of possible introduction by wildflower enthusiasts. The Pope County population was obviously native as additional collecting showed

the species occupies a relatively large area and is an extension of populations in adjacent Kentucky.

Perhaps the most exciting find of this Shawnee Forest work was made in the Ozark Hills of Alexander County. While examining the possible boundaries of a natural area holding one of the largest populations of Yellowwood Trees (*Cladrastis kentuckea*) in Illinois, I was pushing my way through a clone of shrubs. Suddenly I realized that I did not know this shrub! After collecting and keying it out, I realized I had added Big Leaf Snowbell Bush (*Styrax grandifolia*) to the known Illinois flora (Schwegman, 1968).

I continued as Field Representative for the Commission through the end of 1971, with most of my work in Southern Illinois. State record plants found during this work were Supple Jack (*Berchemia scandens*) from a pine plantation in Pope County (Schwegman, 1970), Broad-winged Sedge (*Carex alata*) from near Round Pond Swamp in Pope County (Schwegman, 1971), Spreading Eryngo (*Eryngium prostratum*), a tiny relative of Rattlesnake Master from Teal Pond near Bell Smith Springs in Pope County (Schwegman, 1971), and Hairy Lettuce (*Lactuca hirsuta*) from a dry woods north of McCormick in Pope County (Schwegman, 1972). I also did some work in Central Illinois during this time. While evaluating potential natural areas at Siloam Springs State Park near Quincy, I encountered a *Carex* species new to me in one of the many springs. It keyed readily to *Carex prasina*, an eastern species not previously found in Illinois (Schwegman, 1972). One would expect a new eastern species to be found first in eastern Illinois, but here it was in far western Illinois. It is interesting to note that it has since been found in southeastern Illinois as well.

In January 1972 I accepted the challenge of developing a natural areas program for the Illinois Department of Conservation and moved to Springfield. This move gave my plant collecting a more statewide perspective, as I was getting around to all parts of Illinois in my work with natural areas. At the same time, my pace of botanical discovery slowed considerably because of the more intensive botanizing the remainder of the state had experienced.

My first state record after moving to Springfield came in 1975 while botanizing a sandy, sunny, wet field near Snicarte in Cass County. A large clumped bulrush (*Scirpus sp.*) was scattered throughout a large stand otherwise dominated by the annual Hall's Bulrush (*Schoenoplectus* hallii). The clumped bulrush did not key to anything in manuals at hand and seemed most like *S. olneyi*, a coastal species. I eventually sent a specimen to Dr. Alfred Schuyler at the Philadelphia Academy of Sciences who identified it as Mucronate Bulrush (*Scirpus mucronatus* now *Schoenoplectus mucronatus*) (Schwegman, 1984b). At that time, this "old world" species was established in North America only in California. I feel that this species arrived in Illinois by natural means, probably on the feet of birds. This makes it naturally occurring, if not "native".

I had always assumed that I would never find a new native plant for Illinois in the Chicago Region because it is so well known. However, while exploring along the Des Plaines River in Will County in 1982, I came upon a rocky slope along the river covered with Valerianella (*Valerianella chenopodifolia*) (Schwegman, 1984).While known from the Chicago Region, it had not been reported from Illinois. The habitat is south of Route 6 and between a surface mined area and the Des Plaines River.

After changing jobs at the DNR from Natural Area Manager to Native Plant Conservation Manager in 1980, I increased my botanical activities.

While working on a study of the distribution of the Jeweled Shooting Star in Illinois (Schwegman 1984a) I made one of my most spectacular plant discoveries. In late April of 1981, District Natural Heritage Biologist Randy Nyboer and I were searching for Shooting Stars in the Driftless Area of northwestern Illinois. After a day of climbing bluffs in search of the Shooting Star, Randy decided to head home while I decided to climb one more bluff before heading to Galena for the night.

As I reached a ledge of limestone about two thirds of the way to the top of a river bluff, I came to a strange open area facing northwest. The slope was a treeless jumble of 1 to 2 foot diameter boulders covered with mosses and ferns and with an occasional Paper Birch tree (*Betula papyrifera*) out in it. The first new plant I noticed was a beautiful, large flowered *Clematis* vine in full bloom. At first I assumed it was an escaped cultivar. I collected a specimen and continued to look around. A clumped bristly rose also looked new to me as did a shrub resembling Hazel Nut and a Shadbush. I took the specimens on to the motel and started keying them out after dinner.

I was amazed when the *Clematis* keyed to Mountain Clematis (*C. verticillaris*, now called *C. occidentalis*), a species of the north woods that I previously did not know existed (Figure 2). The rose keyed to the Needle Rose (*Rosa acicularis*), a species of the boreal forest, and the shrub to Beaked Hazelnut (*Corylus cornuta*). These three woody plants were all new to the Illinois flora (Schwegman 1982)! The Shadbush turned out to be *Amelanchier interior*, a very rare species in Illinois. Not only had I found new plants for Illinois, but an entirely new ecosystem called an algific or cold producing slope. The talus allows water to enter and freeze in winter and holds ice all summer. While adjacent Iowa was famous for this community it was unknown from our state.

I had collected a large-leaved Wood Sorrel in Pope County back in the late 1960s that keyed to *Oxalis grandis*. While it did not fit the descriptions for that

Figure 2. *Clematis occidentalis*.

species well because of its lack of a brown margin on the leaflets and the fact that it grew from a tuber, I had assumed that it was within the variation of that species. In 1979 I was visiting the Blue Ridge Mountains of North Carolina when I came across *Oxalis grandis* in the wild. It was obvious that what we had in Southern Illinois was not this species! I began a study of *Oxalis* by examining specimens labeled *O. grandis* at the Missouri Botanical Garden Herbarium and by getting a loan of *O. grandis* from the Vanderbilt University Herbarium. These specimens were easily divided into two separate species.

As a result of this study, I described the Illinois Wood Sorrel (*Oxalis illinoensis*) as a new species (Schwegman, 1982). In Illinois it is known from along Lusk Creek in Pope County and at several sites in Hardin County where it is usually associated with limestone bedrock. The Flora of North America volume that includes Oxalidaceae is in preparation and accepts this species.

In 1990 I stopped by a shooting range area in Des Plaines Conservation Area near the Kankakee River to botanize. Since there was no shooting going on, I went out north of it to check out the flora in the prairie-like area. It was summer and small temporary wet areas of thin soil over bedrock had dried. In one of them I found the tell-tale leaves of quillworts that had wilted and turned yellow. I collected specimens but was unable to find any megaspores from them for identification. The habitat was similar to that of Black Quillwort (*Isoetes melanopoda*) which I knew from Southern Illinois. Black Quillwort was known from the Chicago Region and I supposed that this was what I had found.

That fall at the Plant Systematics Symposium at Missouri Botanical Garden, I mentioned the find to quillwort authority Carl Taylor of the Milwaukee Public Museum. He simply asked what the bedrock was, and when I answered dolomite, he informed me that it had to be Butler's Quillwort (*Isoetes butleri*), a species that had been found no closer to Illinois than the Ozarks of Missouri. I arranged to get by and collect fresh material the next spring and sure enough, Taylor verified that it was *butleri* (Taylor and Schwegman, 1992). What a find and what a range extension!

About this same time, while searching for Black Spleenwort (*Asplenium resilens*) along the Mississippi River bluffs near the Union County-Alexander County line, I found a fern that I at first took for that species. Upon closer examination, however, it turned out to be a ''giant'' Maidenhair Spleenwort (*Asplenium trichomanes*) growing on limestone. I do not generally get excited about subspecies, but when Robbin Moran told me that it was probably *Asplenium trichomanes* subsp. *quadrivalens* I sent the specimen to him at the New York Botanical Garden. He verified the specimen as the subspecies and included the Illinois record in the Flora of North America fern Volume (vol 2). This worldwide fern has a limited range in North America, being found in the northeast United States and adjacent Canada including the upper Great Lakes. Outside of this range are isolated populations in British Columbia and Quebec in Canada and now in southern Illinois.

In 1997 I retired from the Department of Natural Resources and moved to a low bluff overlooking the Ohio River near Metropolis, IL. I immediately started botanizing the local surroundings and found a population of Nemophila (*Nemophila triloba*) in a wooded ravine, and Powderpuff (*Mimosa strigillosa*) from the banks of the Ohio, at my home. Both were new native plants for Illinois from the south. I also collected from areas of sand deposited by the flood of 1993 on the Mississippi River floodplain near Horseshoe Lake in Alexander County. Among my collections here was the annual blue aster, *Aster exilis* also new to the state from the south. I have not published these records, but have deposited specimens of them in the Herbarium of the Illinois Natural History Survey.

As one would expect, some of my discoveries have not fared well over the many decades since their discovery. Within 15 years of its discovery, Beard Grass had disappeared from its only known Illinois locality. Apparently succession of its habitat from barrens to brush and trees in the absence of fire killed off the species. The Barren Strawberry is gone from it's only known Illinois site, apparently killed by the drought of 1988. Needle Rose has disappeared from the algific slope where it was once common due to browsing by deer. I visited the site in spring 2008 and not a live sprig could be found. While at this site I also noticed that the Mountain Clematis was now reduced to one plant and was sterile. The decline in this boreal species may be related to our warming climate. One

can only wonder how many species we have lost before they were even discovered.

Botanical exploration has held an important place in my professional life, but perhaps more importantly it has given me countless hours of enjoyment searching for the new and unexpected. I involved my family in the search as well as we crossed the continent in search of all of the Lady Slipper Orchids north of Mexico. We would pull up to some likely spot and the kids and parents would fan out in search of the trophy. I eventually photographed all 11 Lady Slippers, but that is another story.

If the reader has not already been in the field in search of interesting plants, I hope this article will stimulate the beginning of many pleasurable outings. I know there are many more rarities to be found.

LITERATURE CITED

Gleason, H. A. 1963. Illustrated flora of the northeastern United States and adjacent Canada, in 3 vols. (revised third printing) Hafner Publishing Co., NY.

Mohlenbrock, R. H. 2002. Vascular flora of Illinois. Southern Illinois University Press, Carbondale and Edwardsville, Illinois. 490 pp.

Mohlenbrock, R. H. and J. Schwegman. 1969a. New and unusual grass and sedge records for Illinois. Transaction of the Illinois State Academy of Science 62:100–101.

Mohlenbrock, R. H. and J. Schwegman. 1969b. A new species of *Carex* Sect. Bracteosae. Brittonia 21:77–79.

Schwegman, J. 1968a. New plant records from southern Illinois. Transactions of the Illinois State Academy of Science 61:313–314.

Schwegman, J. 1968b. Notes on *Woodwardia areolata* and other rare Illinois ferns. American Fern Journal 58:89–90.

Schwegman, J. E. 1968c. *Styrax grandifolia* in Illinois. Castanea 33:348–349.

Schwegman, J. E. 1970. Notes on the flora of southern Illinois. Castanea 35:319–321.

Schwegman, J. E. 1972. Additions to the flora of Illinois. Transactions of the Illinois State Academy of Science 65:42–44.

Schwegman, J. E. 1982a. A new species of *Oxalis*. Phytologia 50:463–467.

Schwegman, J. E. 1982b. Additions to the vascular flora of Illinois. Castanea 47:243–247.

Schwegman, J. E. 1984a. The jeweled shooting star (*Dodecatheon amethystinum*) in Illinois. Castanea 49:74–82.

Schwegman, J. E. 1984b. *Scirpus mucronatus* and *Valerianella chenopodifolia* in Illinois. Transactions of the Illinois State Academy of Science 77:67–69.

Schwegman, J. and R. H. Mohlenbrock. 1966. Botanical field studies in the southern tip of Illinois. Transactions of the Illinois State Academy of Science 59:369–372.

Schwegman, J. and R. H. Mohlenbrock. 1968. Notes on the flora of extreme southern Illinois. Transactions of the Illinois State Academy of Science 61:317–319.

Taylor, W. C. and J. E. Schwegman. 1992. *Isoetes butleri* in Illinois. American Fern Journal 82:82–83.

Erigenia, Number 23, Winter 2010, p 45

Abstract

Ecological Divergence Among Three Cytotypes of *Solidago altissima* L.

Matthew Richardson[1]

Abstract. Conspecific plants with different numbers of chromosomes can differ in genetic variation, morphology, life history traits, phenology of flowering, and physiology. I investigated the distribution of diploid, autotetraploid, and autohexaploid plants of the species *Solidago altissima* L. (Asteraceae) in Illinois to test the following hypotheses: 1) cytotypes are sympatric; 2) cytotypes differ in microhabitat; and 3) cytotypes differ in morphology and flowering phenology. All three cytotypes of *S. altissima* were present at most of my ten study sites in eastern and northeastern Illinois, supporting hypothesis 1. Ramets of different cytotypes inhabited different microhabitats, supporting hypothesis 2: diploids tended to grow in open areas far from trees and other woody plants where they were surrounded by grasses and high species richness of herbaceous plants, tetraploids differed only in that they grew in areas with slightly more shade and were surrounded by less grass and a lower species richness, while hexaploids grew in proximity to trees and other woody plants where grasses were not dominant. Morphology also varied with cytotype, supporting hypothesis 3: hexaploids were taller than diploids and tetraploids and had more leaves that were longer and wider. However, none of these morphological traits differed with cytotype in a common garden, suggesting that morphology is determined by environmental factors that differ across microhabitats rather than cytotype alone.

[1] 66 NSRC, 1101 West Peabody Drive, Urbana, IL 61801.

INVITATION FOR SUBMISSION OF ARTICLES

ERIGENIA is a peer-reviewed journal of the Illinois Native Plant Society. We invite the submission of original articles on the biota of Illinois and adjacent states. This is a partial list of articles of interest to society members.

TAXONOMY of vascular plants, fungi, lichens, and mosses

ECOLOGY of native species and plant communities; interactions and effects of birds, mammals, and insects on our ecosystem

NATURAL HISTORY of our state, including geology and geography

ETHNOBOTANY of native plants, their use by Native Americans

CULTURAL HISTORY as it intersects with natural history

BOTANISTS, SCIENTISTS, EXPLORERS, and BOTANICAL ARTISTS who have played a major role in our understanding of our state and its natural resources

RESTORATION of our native landscapes, management techniques and results

HORTICULTURE as it relates to native plants in restored or cultural environments

INSTRUCTIONS FOR AUTHORS

Authors may submit material as an e-mail attachment to Tracy Evans at tracy.evans@illinois.gov or on a CD to:

Tracy Evans
INDR Impact Assessment Division
One Natural ResourcesWay
Springfield, Illinois 62702-7940

Manuscripts must be submitted as an MS Word document in a single font, double-spaced, and left-aligned. Tables and illustrations must fit in a 7 x 9 inch area. Authors should retain copies of all material submitted.

The title page of the manuscript should state the affiliation and complete addresses of all the authors; the telephone number of the corresponding author should also be supplied. All papers will be reviewed and copy-edited.

ABSTRACTS

Research and technical papers should include a one-paragraph abstract of not more than 250 words. The abstract should state concisely the goals, principal results, and major conclusions of the paper.

TAXONOMIC NAMES

Either a standard taxonomic manual should be cited whose names are followed consistently, or the scientific names should be followed by their authority. Common names, if used, should be referenced to a scientific name. Thereafter, scientific names are recommended, but either may be used if done so consistently.

PAGE CHARGES

Page charges for society members are suspended temporarily. Page charges of $25 per page will be assessed for non-members.

Illinois Native Plant Society
P.O. Box 3341
Springfield, IL 62708

Non-Profit Org.
U.S. Postage
PAID
Springfield, IL
Permit #500

Return Service Requested

Contents *Erigenia* 23, Winter 2010
