US Army Corps of Engineers
Waterways Experiment Station

Wetlands Research Program Technical Report WRP-DE-8

Floristic Index for Establishing Assessment Standards: A Case Study for Northern Ohio

by Barbara K. Andreas, Robert W. Lichvar

August 1995 – Final Report
Approved For Public Release; Distribution Is Unlimited

Wetlands Research Program

Technical Report WRP-DE-8
August 1995

Floristic Index for Establishing Assessment Standards: A Case Study for Northern Ohio

by Barbara K. Andreas

Cuyahoga Community College
Division of Natural Sciences
Cleveland, OH 44122
and
Department of Biological Sciences
Kent State University
Kent, OH 44242

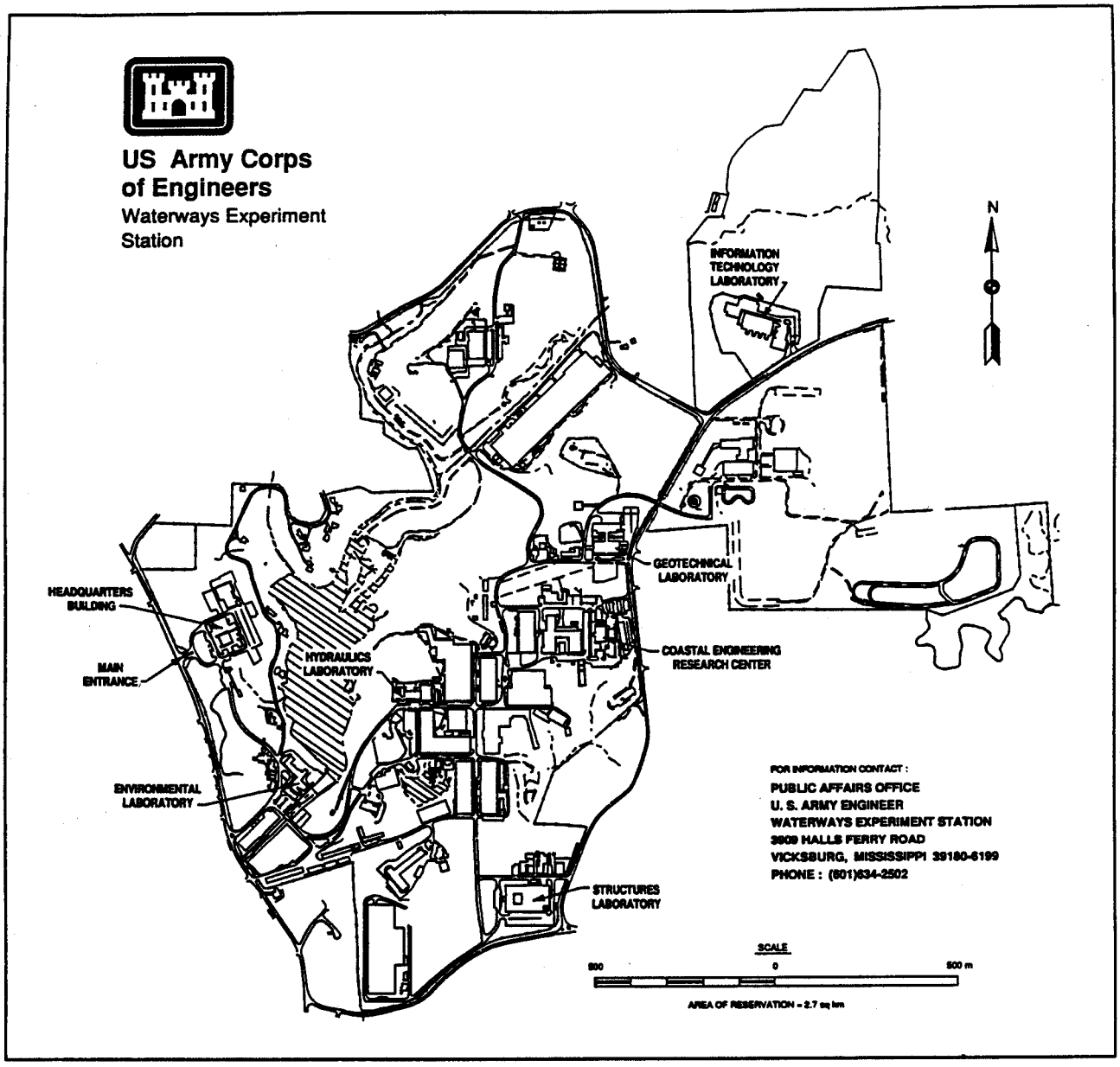
Robert W. Lichvar

U.S. Army Corps of Engineers
Waterways Experiment Station
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

Final report

Approved for public release; distribution is unlimited

Prepared for U.S. Army Corps of Engineers
Washington, DC 20314-1000



Waterways Experiment Station Cataloging-in-Publication Data

Andreas, Barbara K.

Floristic index for establishing assessment standards : a case study for northern Ohio / by Barbara K. Andreas, Robert W. Lichvar ; prepared for U.S. Army Corps of Engineers.

87 p. : ill. ; 28 cm. -- (Technical report ; WRP-DE-8) (Wetlands Research Program technical report ; WRP-DE-8)

Includes bibliographic references.

1. Wetland plants -- Ohio -- Indexes. 2. Exotic plants. 3. Plants -- Indexes. I. Lichvar, Robert Wayne. II. United States. Army. Corps of Engineers. III. U.S. Army Engineer Waterways Experiment Station. IV. Wetlands Research Program (U.S.) V. Title. VI. Series: Wetlands Research Program technical report ; WRP-DE-8. VII. Series: Technical report (U.S. Army Engineer Waterways Experiment Station) ; WRP-DE-8.

TA7 W34 no.WRP-DE-8

Wetlands Vegetation

Floristic Index for Establishing Assessment Standards: A Case Study for Northern Ohio (TR WRP-DE-8)

ISSUE:

The assemblage of plant species can indicate various responses to environmental gradients and disturbances. Information is needed about the occurrence of species within natural and disturbed plant communities for establishing reference standards for use in the hydrogeomorphic approach used for evaluating wetland conditions and natural places.

RESEARCH:

A floristic checklist was compiled for 31 counties in northern Ohio. Rankings of 1 to 10 were assigned to native taxa based on their degree of fidelity to a range of synecological parameters. Plants found in a variety of plant communities, including disturbed sites, were assigned rankings of 1 to 3. Rankings of 4 to 6 were applied to taxa that typically are associated with a specific plant comunity, but tolerate moderate disturbance to that community. Rankings of 7 to 8 were applied to those taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance. Those plants with high degrees of fidelity to a narrow range of synecological parameters were assigned a value of 9 to 10.

SUMMARY:

The floristic quality index for 2,063 plant species in northern Ohio provides a tool to assess the quality of naturalness or presence of conservative species. It allows for an objective numerical comparison of two or more unrelated community types and reflects numerically the impact of human disturbance by taking into account the presence of alien taxa. The ability to evaluate floristically and assign a repeatable quantitative value has use in assessing wetland restoration projects and in designing and monitoring mitigation creations.

AVAILABILITY OF REPORT:

This report is available on Interlibrary Loan Service from the U.S. Army Engineer Waterways Experiment Station (WES) Library, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199, telephone (601) 634-2355.

To purchase a copy, call the National Technical Information Service (NTIS) at (703) 487-4650. For help in identifying a title for sale, call (703) 487-4780.

NTIS report numbers may also be requested from the WES librarians.

About the Authors:

Dr. Barbara K. Andreas is a professor at Cuyahoga Community College and Kent State University, OH. Mr. Robert W. Lichvar is a botanist at the WES Environmental Laboratory. Point of Contact is Mr. Lichvar, Phone: (601) 634-2938.

Mr. Robert W. Lichvar is now at Cold Regions Research and Engineering Laboratory (CRREL), phone: 603-646-4657. (April 2001)

Contents

Preface

The work described in this report was authorized by Headquarters, U.S. Army Corps of Engineers (HQUSACE), as part of the Wetlands Evaluation Task Area of the Wetlands Research Program (WRP). The work was performed under Work Unit 32755, for which Mr. Dan Smith was the Technical Manager. Mr. Sam Collinson (CECW-OR) was the WRP Technical Monitor for this work.

Mr. Dave Mathis (CERD-C) was the WRP Coordinator at the Directorate of Research and Development, HQUSACE; Dr. William L. Klesch (CECW-PO) served as the WRP Technical Monitor's Representative; Dr. Russell F. Theriot, Environmental Laboratory (EL), U.S. Army Engineer Waterways Experiment Station (WES), was the Wetlands Program Manager. Mr. Ellis J. Clairain, Jr., EL, WES, was the Task Area Manager.

The work was performed at Cuyahoga Community College and Kent State University, OH, by Dr. Barbara K. Andreas and at WES by Mr. Robert W. Lichvar, Wetlands Branch (WB), Ecological Research Division (ERD), EL. The preparation of the report was under the direct supervision of Mr. E. Carl Brown, Chief, WB; Dr. Conrad J. Kirby, Chief, ERD; and Dr. John W. Keeley, Director, EL.

Grateful appreciation is extended to Mr. Aaron R. Andreas, Mr. Gary R. Bryan, Ms. Kim D. Herman, and Mr. Jeffrey D. Knoop for their assistance in the preparation of the manuscript. Special thanks are extended to Dr. Gerould Wilhelm for giving much advice and leadership in the development of this project.

At the time of publication of this report, Director of WES was Dr. Robert W. Whalin. Commander was COL Bruce K. Howard, EN.

This report should be cited as follows:

Andreas, B. K., and Lichvar, R. W. (1995). "Floristic index for establishing assessment standards: A case study for northern Ohio," Technical Report WRP-DE-8, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

1 Introduction

The U.S. Army Corps of Engineers is developing a procedure for assessing wetland functions using functional indices (Smith 1995). This procedure compares wetlands using functional indices calibrated to regional reference wetlands. Reference standards are conditions exhibited by a group of reference wetlands that correspond to the highest level of functioning (highest sustainable capacity) across the suite of functions of a regional wetland subclass. The quality of species occurrences at regional reference wetlands can be used to assist in the calibration of the vegetation components of functional indices.

The purpose of this report was to adapt the existing Wilhelm method (Swink and Wilhelm 1979, 1994) for evaluating the reference standard for species occurrences at reference wetlands and other vegetated habitats as a method to evaluate natural places by providing a floristic quality assessment index. This report contains a floristic checklist that is applicable to 31 counties in northern Ohio. The quality index ratings presented here are intended to both assist regional efforts to establish reference standards for species occurrence in wetlands and evaluate natural places in this region.

The modern native flora of northern Ohio is composed of a mixture of taxa that became established after the melting of the last Wisconsinan ice advance, about 16,000 BP (Goldthwait 1959). The native flora of this part of glaciated Ohio resulted from (a) the northward migration of species that survived south of the glacial moraine (Delcourt and Delcourt 1981), (b) the establishment in suitable habitats of northern plants that had migrated southward into Ohio in front of the glacial advance, (c) the eastward extension of prairie plants and plants more typical of drier areas that occurred during the Xerothermic Period 8,000 - 5,000 years BP (Benninghoff 1964), and (d) the westward migration of coastal species via eastward drainage channels that formed in the St. Lawrence lowlands as the ice front retreated (Andreas 1989).

At the time of the arrival of the European settlers, it is estimated that about 96 percent of Ohio was forested (Gordon 1966; Cooperrider 1982). The remaining 4 percent of the land surface was open areas of freshwater marshes, peatlands, prairies, and barrens (Sears 1926; Transeau 1935; Gordon 1966, 1969). Through historical accounts written by early land surveyors, Gordon (1969) was able to reconstruct the original (presettlement) vegetation of Ohio

by focusing on large tracts of contiguous forest types. Forsyth (1970) correlated Gordon's vegetation types to edaphic factors such as the availability of moisture, parent geologic material, topography, and direction of slope. Forsyth found that the distribution of these vegetation types, or plant communities, is predictable on the basis of climate, geology, and topography.

Through time, native taxa adapted to a specific set of biotic and abiotic factors of natural disturbance such as the local extremes of drought, inundation, fires, storms, and faunal interactions (Wilhelm and Ladd 1988; Hobbs and Huenneke 1992). Because of periodic natural disturbances, a vegetation seldom maintains a constant species composition for more than a few centuries (Noss 1985).

The arrival of European settlers had a profound and permanent effect on the native landscape by changing its physical character (clearing, plowing, and draining) and by the introduction, both deliberate and unwittingly, of alien taxa, creating what Pielou (1979) has called "man-made disjunctions." The terms "alien," "non-native," and "exotic" are used to refer to taxa believed to have been introduced into the flora either with or after the arrival of European settlers. A "native" taxon is one that has maintained historical integrity and ecological processes since some time prior to European settlement (Maser 1990).

The native plant communities observed by the early surveyors and explorers now include a large number of non-native (alien) taxa. Cooperrider (1982) estimated that approximately one-third of the Ohio flora is composed of these alien (mostly Eurasian) species. By contrast, the Hawaiian Islands (one-sixth the size of Ohio) may have as many as 4,600 species of exotic plants, which is about three times the number of native plant species (Soule 1990). The flood of exotic species, along with anthropogenic disturbances, has tended to make more uniform natural landscapes by providing an opportunity for alien taxa to replace native plant species. With the abundance of alien taxa, natural places (natural areas) with intact native floras are becoming rarer.

The surviving undisturbed natural areas dominated by native flora, or those containing remnants of rare plant communities, are often sought out as special places or significant natural areas. To date, there is no adequate way to provide meaningful comparisons of the flora of the different types of plant communities found in these natural places. However, field biologists frequently are asked to evaluate their quality. Herrick (1974), with the help of numerous individuals, compiled preliminary data on 580 Ohio natural areas. In the early 1980s, the Ohio Chapter of The Nature Conservancy, with the help of regional experts, organized a list (scorecard) of the 100 best natural areas remaining in Ohio. Assessing the ecological value of these areas was done visually with the only criterion often being the presence of rare or unusual plant species.

In an attempt to make more objective evaluations and assessments of open land areas, Wilhelm (Swink and Wilhelm 1979) and Wilhelm and Ladd (1988) devised an index of conservatism, a component of their Natural Area Assessment. Their evaluation is based on the fundamental character of the native flora of a region. A numerical quality rating, called the coefficient of conservatism, is assigned to each plant. Each numerical value is an expression of the taxon's autecological value with respect to all other taxa in the flora. The higher the numerical rating, the more conservative is the taxon. Species conservatism reflects the ecological specializations that a plant displays to a specific habitat or set of environmental conditions. The natural quality of an area is reflected by its richness in conservative species.

The coefficient of conservatism is independent of frequency. A plant may be widely distributed in Ohio, but occur in only a limited number of habitats. *Viburnum acerifolium*, primarily found in rich mesic forests, is an example of this situation. Conversely, a plant species may be somewhat uncommon, but occur in various habitats throughout the study range. *Habenaria flava* var. *herbiola*, which grows in wet woods, fens, weedy fields, and margins of pools, is an example. Both species have a value of 6 (Appendix A).

2 Methods

A floristic checklist was compiled for 31 Ohio counties (Appendix A). Data for 20 counties (Ashland, Ashtabula, Columbiana, Cuyahoga, Geauga, Holmes, Knox, Lake, Licking, Lorain, Mahoning, Medina, Morrow, Perry, Portage, Richland, Stark, Summit, Trumbull, and Wayne) were taken from *The Vascular Flora of the Glaciated Allegheny Plateau* (Andreas 1989). These data were collected from extensive field collections by the author as well as from surveys of major Ohio herbaria with specimens from the region (Cleveland Museum of Natural History, Kent State University, Oberlin College, The Ohio State University, Ohio University, and the University of Akron).

Additional records were obtained for Erie, Defiance, Fulton, Henry, Huron, Lucas, Ottawa, Sandusky, Seneca, Williams, and Wood counties by examining county dot-distribution maps prepared by Braun (1967), Cooperrider (1995), Fisher (1988), and Furlow (1991). Additional county records for three species, *Carex longii*, *Panicum spretum*, and *Utricularia geminiscapa*, were obtained from the Division of Natural Areas and Preserves, Ohio Department of Natural Resources. In all, 2,063 species and 30 interspecific hybrids are included on the checklist.

The arrangement of the checklist is alphabetical by genus and species; the family name for each taxon is given in the right column. Nomenclature and circumscription follow Gleason and Cronquist (1991). Where a name differs from the one used by Andreas (1989), the latter is given in synonymy. The native status of taxa was determined from Fernald (1950), Braun (1967), Cooperrider (1995), Furlow (1991), and Gleason and Cronquist (1991).

Following Wilhelm and Ladd (1988), each taxon included in the checklist was assigned a numerical value. The assignment of these values by the authors was based on (a) the senior author's extensive field experience (over 25 years) with the flora of Ohio, (b) descriptions of habitat preferences in local and regional manuals, (c) a survey of information on herbarium labels, and (d) published abstracts of state-listed taxa (McCance and Burns 1984). The values assigned become less valid when applied beyond the study area.

Native species were given numerical ranks, or coefficients of conservatism, between 0 and 10. The ranking of 0 was given to those native taxa that, primarily as a result of human disturbance, have become opportunistic invaders

of natural areas, often creating extensive monocultures (for example, *Phragmites australis*). A ranking of 0 also was assigned to those native taxa that are typically part of a ruderal community (for example, *Ambrosia artemisiifolia*).

Rankings of 1 to 10 were assigned to native taxa based on their degree of fidelity to a range of synecological parameters. Plants found in a variety of plant communities, including disturbed sites, were assigned rankings of 1 to 3. Rankings of 4 to 6 were applied to taxa that typically are associated with a specific plant community, but tolerate moderate disturbance to that community. Rankings of 7 to 8 were applied to those taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance. Those plants with high degrees of fidelity to a narrow range of synecological parameters were assigned a value of 9 to 10.

All alien (non-native) taxa were assigned the value of 0. These plants are preceded with an asterisk (*) in the "Comments" column on the checklist, and their scientific name is printed in bold type.

Plants listed as "threatened," "endangered," or "extirpated" in the Ohio rare plant list (Division of Natural Areas and Preserves 1992) are noted in the "Comments" column on the checklist (Appendix A). While Ohio's rare plant list is updated every 2 years and the status of a taxon may change with the discovery of new sites, the majority of the "rare" taxa are inherently a rare part of the Ohio flora and generally have coefficient of conservatism rankings of 7-10.

Some taxa on the checklist are preceded by a double asterisk (**) in the "Comments" column. These plants fall into the following conditions: (a) taxa considered to be native in another region of Ohio, but adventive or naturalized within the study area (*Aralia spinosa, Campsis radicans, Cercis canadensis, Gymnocladus dioica, Hydrangea arborescens, Ilex opaca, Napaea dioica, Robinia pseudoacacia, Sagina decumbens, Thuja occidentalis*), and (b) taxa that include both native and non-native populations within the study area (*Physostegia virginiana, Pinus strobus, Prunella vulgaris*). For the latter group, the coefficient of conservatism ranking is based on native populations.

Rarely encountered interspecific hybrids, as included in Andreas (1989), Cooperrider (1995), and Furlow (1991), were eliminated from the list. Taxa rarely collected from landfills or gardens were deleted from the checklist.

3 Application of Coefficient of Conservatism to Floristic Quality Assessment System

Following Swink and Wilhelm (1979) and Wilhelm and Ladd (1988), the coefficients of conservatism can be used to arrive at a numerical value called the Floristic Quality Assessment Index (I). This numerical value provides a floristic based assessment of the natural area related to the degree of artificial disturbance indicated by the presence of non-native or opportunistic native taxa. The floristic quality assessment indices from different types of vegetation can be objectively compared. The index value does not imply that one type of vegetation is "better" than another; it simply provides a way of measuring the degree of naturalness of the species found there. The floristic quality assessment index is also useful in comparing how vegetation changes over time, either from natural succession or from management. In this situation, a repeatable vegetation sampling method would be used in conjunction with the floristic quality assessment index.

The application of this method requires field sampling by an experienced field biologist able to discern the subtle differences in the floristic elements. Following Wilhelm and Ladd (1988), the floristic quality assessment is constructed in the following manner:

a. Compile a list of the plants growing in the area to be assessed, independent of community types.

b. Assign coefficients of conservatism to each plant listed (Appendix A).

c. Determine the mean coefficient value by adding the coefficients of native plants recorded from the area, and dividing the sum by the total number of native plants.

d. Multiply the mean coefficient by the square root of the total number of native species.

e. The product obtained is the floristic quality assessment index (I).

Expressed mathematically,

$$I = \frac{R}{\sqrt{N}}$$

where

I = floristic quality assessment index

R = sum of valuation coefficients for all plants recorded in the area

N = number of different native species recorded

According to Wilhelm and Ladd (1988), "by treating diversity as the square root of N, increasing extremes of diversity are dampened to allow lower-diversity, specialized and often small areas of very high mean quality to rate favorably in relation to larger, often more diverse areas with lower overall mean qualities."

Table 1 provides an example of a floristic quality assessment index for two Ohio peatlands. In addition to the presence of a *Sphagnum*-dominated mat, these two areas have in common that no alien taxa were recorded from within either study area. Flatiron Lake Bog contains 11 state-listed rare plants, whereas Silica Sand Quarry Bog contains 4. Flatiron Lake Bog (Andreas and Bryan 1990) is a low diversity, high quality natural area. The floristic quality assessment index value for Flatiron Lake Bog is I = 37.53. The second area, Silica Sand Quarry Bog, has developed on the floor of a sandstone quarry within the past 80 years (Andreas and Host 1983). The floristic quality assessment index value for Silica Sand Quarry Bog is I = 26.22. The difference in the floristic index values between the undisturbed Flatiron Lake Bog and the disturbed Silica Sand Quarry Bog are probably a result of human disturbance and is reflected in the numerical values between the two sites.

The range of floristic index values can vary depending upon the quality of the species composition occurring in an area. For example, Wilhelm and Ladd (1988) reported values for woodlands ranging from as low as 10 to as high as 80 (or more). When they compared three sites within the Chicago region, each about 1 acre[1] in size, the index value for an old field was I = 8.4, for a degraded prairie, I = 28, and for a high quality prairie, I = 50.

Assigned values for a particular species can differ between physiographic regions. For example, when Wilhelm and Ladd's species list for the old field (I = 8.4) was subjected to the coefficient of conservatism values presented in this study, the result is I = 10.2 (Table 2). The major difference in the values for the two areas is the coefficient of conservatism for *Aster drummondii*.

---

[1] To convert acres to square meters, multiply by 4,046.873.

This plant is relatively rare in Ohio and is listed as endangered on Ohio's rare plant list (Division of Natural Areas and Preserves 1992). Therefore, the coefficient of conservatism values presented here will probably vary for another geographic region outside of northern Ohio.

Overall, Wilhelm and Ladd found that natural areas with ranking above 35 are significant from a regional perspective. Areas rating above 50 were extremely rare. It should be noted that Wilhelm and Ladd assigned special values (15 and 20) to those taxa considered threatened or endangered within the Chicago region. As a result, their Natural Areas Index values for rare communities would be higher than is possible under a strict 0-10 ranking system.

The floristic quality assessment index can be used in establishing reference standards for regional wetland subclass. The index can also provide a method to measure the response of the vegetation community to mitigation from invasion of non-native to native species. This measurement provides a numerical method to rate the results from various mitigation methods from either enhancement, restoration, or creation.

4 Conclusions

The floristic quality assessment index (index of conservatism) for northern Ohio was developed as a tool to assess the nativeness of an area based on the presence of conservative species. The floristic quality assessment index allows for an objective numerical comparison of two or more unrelated community types for the occurrence of higher quality assemblages of species, impacts by human disturbance reflected in the presence of alien species, or the capability to assist with calibration of the vegetation component of wetland functional indices. It allows for an objective numerical comparison of two unrelated community types and reflects numerically the impact of human disturbance by taking into account the presence of alien taxa.

Numerical values included in this report become less valid outside of the study area for several reasons. These include changes in species distribution patterns, abundance, and changes in habitat. Values for coefficient of conservatism are available for other areas outside of northern Ohio, including the state of Michigan (Herman et al. 1993) and northern Illinois (Swink and Wilhelm 1979, 1994). Michigan (Herman et al. 1993) has compiled for publication a Floristic Quality Assessment Index applicable to the entire state.

The floristic quality assessment index does provide a repeatable method for monitoring changes in species composition over time, evaluating wetland functions, natural area acquisition, selection of land management techniques, assessing the success of restoration efforts, designing and monitoring mitigation, and in evaluating wetlands. The results of land management, whether it be for mitigation or for restoration, require monitoring and evaluation. This report presents the background, the coefficient of conservatism values, and the steps to follow in order to establish a numerical rating for the floristic quality of plant communities in northern Ohio.

Fisher, T. R. (1988). *The Dicotyledoneae of Ohio. Part 3: Asteraceae.* Ohio State University Press, Columbus, OH.

Forsyth, J. L. (1970). "A geologist looks at the natural vegetation map of Ohio," *Ohio J. Sci.* 70, 180-191.

Furlow, J. J. (1991). "The vascular flora of Ohio. Volume 2, Part 1, Dicotyledoneae: Sauraceae through Fabaceae," Checklist and distribution maps, Reprographic manuscript, Ohio State University, Columbus, OH.

Gleason, H. A., and Cronquist, A. (1991). *Manual of the vascular plants of Northeastern United States and adjacent Canada.* 2nd ed., New York Botanical Garden, Bronx, NY.

Goldthwait, R. P. (1959). "Scenes in Ohio during the last Ice Age," *Ohio J. Sci.* 59, 193-216.

Gordon, R. B. (1966). Natural vegetation map of Ohio at the time of the earliest land surveys. *Ohio Biol. Surv.*, Columbus, OH.

_____. (1969). "The natural vegetation of Ohio in pioneer days," *Ohio Biol. Surv. Bull. New Series* 3(2), Columbus, OH.

Herman, K. D., Penskar, M. R., Reznicek, A. A., Brodowicz, W. M., Wilhelm, G., and Wetstein, L. (1993). "Michigan floristic assessment system with wetland categories (Draft version)," Reprographic manuscript, Michigan Natural Features Inventory, Natural Heritage Program, Lansing, MI.

Herrick, J. A. (1974). "The natural areas project. A summary of data to date," Ohio Biological Survey, Informative Circular No. 1, Columbus, OH.

Hobbs, R. J., and Huenneke, L. F. (1992). "Disturbance, diversity and invasion: Implications for conservation," *Conservation Biology* 6, 324-337.

Maser, C. (1990). "On the "naturalness" of natural areas: A perspective for the future," *Natural Areas Journal* 10, 129-133.

McCance, R. M., Jr., and Burns, J. F., ed. (1984). *Ohio endangered and threatened vascular plants: Abstracts of state-listed taxa.* Division of Natural Areas and Preserves, Ohio Department of Natural Resources, Columbus, OH.

Noss, R. F. (1985). "On characterizing presettlement vegetation: How and why," *Natural Areas Journal* 5, 5-19.

Pielou, E. C. (1979). *Biogeography.* John Wiley & Sons, New York.

Sears, P. B. (1926). "The natural vegetation of Ohio. II. The prairies," *Ohio J. Sci* 26, 128-146.

Smith, R. D. "An approach for assessing wetland functions using hydrogeomorphic classification, reference wetlands, and functional indices," Technical Report WRP in preparation, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Soule, M. E. (1990). "The onslaught of alien species, and other challenges in the coming decade," *Conservation Biology* 4, 233-239.

Swink, F., and Wilhelm, G. (1979). *Plants of the Chicago region.* Morton Arboretum, Lisle, IL.

_____. (1994). *Plants of the Chicago region.* Indiana Academy of Science, Indianapolis, IN.

Transeau, E. N. (1935). "The prairie peninsula," *Ecology* 16, 423-437.

Wilhelm, G., and Ladd, D. (1988). "Natural areas assessment in the Chicago region," *Trans. 53rd N.A. Wildl. and Nat. Res. Conf.* 361-375.

Table 1
Floristic Quality Assessment for Two Peatlands in Portage County, Ohio

Flatiron Lake Bog		Silica Sand Quarry Bog	
Coefficient of Conservation	**Taxon**	**Coefficient of Conservation**	**Taxon**
2	*Acer rubrum*	2	*Acer rubrum*
5	*Aronia melanocarpa*	5	*Amelanchier arborea*
7	*Betula alleghaniensis*	3	*Andropogon virginicus*
3	*Bidens coronata*	5	*Aronia melanocarpa*
10	*Calla palustris*	6	*Bartonia virginica*
9	*Carex atlantica var. capillacea*	6	*Betula populifolia*
8	*Carex canescens*	8	*Carex canescens*
9	*Carex trisperma*	5	*Carex lacustris*
7	*Cephalanthus occidentalis*	3	*Danthonia spicata*
10	*Chamaedaphne calyculata*	7	*Drosera rotundifolia*
5	*Decodon verticillatus*	7	*Gaylussacia baccata*
7	*Drosera rotundifolia*	4	*Juncus canadensis*
6	*Dulichium arundinaceum*	1	*Juncus effusus*
7	*Gaylussacia baccata*	1	*Leersia oryzoides*
2	*Glyceria striata*	3	*Lycopodium clavatum*
7	*Ilex verticillata*	9	*Lycopodium inundatum*
1	*Juncus effusus*	6	*Lycopodium tristachyum*
10	*Larix laricina*	7	*Nyssa sylvatica*
1	*Leersia oryzoides*	2	*Populus grandidentata*
4	*Lycopus virginicus*	2	*Populus tremuloides*
10	*Nemopanthus mucronatus*	4	*Prunus pensylvanica*
7	*Nyssa sylvatica*	4	*Quercus palustris*
6	*Osmunda cinnamomea*	1	*Scirpus cyperinus*
4	*Polygonum arifolium*	4	*Spiraea tomentosa*
10	*Rhynchospora alba*	4	*Thelypteris palustris*
5	*Rubus hispidus var. obovalis*	8	*Toxicodendron vernix*

(Continued)

Note:
R = Sum of valuation coefficients for all plants recorded in the area.
N = Number of different native species recorded.
I = Floristic quality assessment index.

Table 1 (Concluded)

Flatiron Lake Bog		Silica Sand Quarry Bog	
Coefficient of Conservation	**Taxon**	**Coefficient of Conservation**	**Taxon**
10	*Sarracenia purpurea*	7	*Triadenum virginicum*
1	*Scirpus cyperinus*	2	*Typha latifolia*
8	*Toxicodendron vernix*	7	*Vaccinium angustifolium*
7	*Triadenum virginicum*	5	*Vaccinium corymbosum*
8	*Vaccinium macrocarpon*	8	*Vaccinium macrocarpon*
5	*Vaccinium corymbosum*		
2	*Viburnum dentatum var. lucidum*		
9	*Woodwardia virginica*		
10	*Xyris difformis*		
R = 222; = N = 35; I = 37.53		R = 146; N = 31; I = 26.22	

Table 2
Index Values for Plants in an Old Field in Chicago Region Using Coefficient of Conservatism from Wilhelm and Ladd (1988) and Present Study

Taxon	Wilhelm and Ladd[1] Values	Present Study Values for Northern Ohio
Acalypha rhomboidea	0	0
Achillea millefolium		0
Agrostis alba (= A. gigantea)		0
Ambrosia artemisiifolia	0	0
Asclepias syriaca	0	0
Aster pilosus	1	1
Aster drummondii	2	8
Barbarea vulgaris		0
Carex laxiflora	1	3
Chrysanthemum leucanthemum		0
Cichorium intybus		0
Cirsium arvense		0
Cirsium vulgare		0
Crataegus mollis	2	3
Dactylis glomerata		0
Danthonia spicata	5	3
Daucus carota		0
Festuca elatior		0
Fragaria virginiana	1	2
Geum canadense	0	2
Geum laciniatum	1	2
Lonicera maackii		0
Medicago lupulina		0
Panicum implicatum (= P. languinosum)	3	2
Parthenocissus inserta (= P. vitacea)	1	1

(Continued)

Note:
R = Sum of valuation coefficients for all plants recorded in the area.
N = Number of different native species recorded.
I = Floristic quality assessment index.
[1] Wilhelm and Ladd did not assign values for alien taxa.
[2] Considered an alien taxon in Ohio.

Table 2 (Concluded)

Taxon	Wilhelm and Ladd[1] Values	Present Study Values for Northern Ohio
Phleum pratense		0
Plantago lanceolata		0
Poa pratensis		0
Polygonatum canaliculatum	3	5
Potentilla simplex	4	1
Prunella vulgaris	0	0
Prunus serotina	1	3
Prunus virginiana	1	2
Pyrus ioensis[2]	2	0
Rhamnus carthartica		0
Rosa multiflora		0
Rubus occidentalis	2	1
Solanum dulcamara		0
Solidago altissima (= S. canadensis)	1	1
Solidago nemoralis	4	3
Taraxacum officinale		0
Trifolium pratense		0
Ulmus americana	3	1
Viola papilionacea (= V. sororia)	0	2
Vitis riparia	4	4
	R = 42; N = 25; I = 8.4	R = 50; N = 24; I = 10.2

Wetlands Research Program

Technical Report WRP-DE-8
August 1995

Floristic Index for Establishing Assessment Standards: A Case Study for Northern Ohio

by Barbara K. Andreas

Cuyahoga Community College
Division of Natural Sciences
Cleveland, OH 44122
and
Department of Biological Sciences
Kent State University
Kent, OH 44242

Robert W. Lichvar

U.S. Army Corps of Engineers
Waterways Experiment Station
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

Final report

Approved for public release; distribution is unlimited

Prepared for U.S. Army Corps of Engineers
Washington, DC 20314-1000

Wetlands Vegetation

Floristic Index for Establishing Assessment Standards: A Case Study for Northern Ohio (TR WRP-DE-8)

ISSUE:

The assemblage of plant species can indicate various responses to environmental gradients and disturbances. Information is needed about the occurrence of species within natural and disturbed plant communities for establishing reference standards for use in the hydrogeomorphic approach used for evaluating wetland conditions and natural places.

RESEARCH:

A floristic checklist was compiled for 31 counties in northern Ohio. Rankings of 1 to 10 were assigned to native taxa based on their degree of fidelity to a range of synecological parameters. Plants found in a variety of plant communities, including disturbed sites, were assigned rankings of 1 to 3. Rankings of 4 to 6 were applied to taxa that typically are associated with a specific plant comunity, but tolerate moderate disturbance to that community. Rankings of 7 to 8 were applied to those taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance. Those plants with high degrees of fidelity to a narrow range of synecological parameters were assigned a value of 9 to 10.

SUMMARY:

The floristic quality index for 2,063 plant species in northern Ohio provides a tool to assess the quality of naturalness or presence of conservative species. It allows for an objective numerical comparison of two or more unrelated community types and reflects numerically the impact of human disturbance by taking into account the presence of alien taxa. The ability to evaluate floristically and assign a repeatable quantitative value has use in assessing wetland restoration projects and in designing and monitoring mitigation creations.

AVAILABILITY OF REPORT:

This report is available on Interlibrary Loan Service from the U.S. Army Engineer Waterways Experiment Station (WES) Library, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199, telephone (601) 634-2355.

To purchase a copy, call the National Technical Information Service (NTIS) at (703) 487-4650. For help in identifying a title for sale, call (703) 487-4780.

NTIS report numbers may also be requested from the WES librarians.

About the Authors:

Dr. Barbara K. Andreas is a professor at Cuyahoga Community College and Kent State University, OH. Mr. Robert W. Lichvar is a botanist at the WES Environmental Laboratory. Point of Contact is Mr. Lichvar, Phone: (601) 634-2938.

Mr. Robert W. Lichvar is now at Cold Regions Research and Engineering Laboratory (CRREL), phone: 603-646-4657. (April 2001)

Contents

Appendix A
A Checklist of Vascular Plants for the Floristic Quality Assessment for Northern Ohio

Key: C of C = Coefficient of Conservatism
* and bold = Alien Taxon
** = Native to another region of Ohio, or includes both native and nonnative populations
X = Extirpated[1]
E = Endangered[1]
T = Threatened[1]

1 Division of Natural Areas and Preserves 1992. References cited in this appendix are listed at the end of the main text.

COMMENTS	C OF C	GENUS	SPECIFIC EPITHET	FAMILY
*	0	**Abutilon**	**theophrasti**	MALVACEAE
*	0	**Acalypha**	**ostryaefolia**	EUPHORBIACEAE
	0	Acalypha	rhomboidea	EUPHORBIACEAE
	0	Acalypha	virginica	EUPHORBIACEAE
	3	Acer	negundo	ACERACEAE
E	10	Acer	pensylvanicum	ACERACEAE
*	0	**Acer**	**platanoides**	ACERACEAE
	2	Acer	rubrum	ACERACEAE
	3	Acer	saccharinum	ACERACEAE
	6	Acer	saccharum	ACERACEAE
	8	Acer	spicatum	ACERACEAE
*	0	**Achillea**	**millefolium**	ASTERACEAE
E	10	Aconitum	noveboracense	RANUNCULACEAE
	4	Acorus	calamus	ACORACEAE
	7	Actaea	alba (A. pachypoda)	RANUNCULACEAE
T	9	Actaea	rubra	RANUNCULACEAE
	6	Adiantum	pedatum	ADIANTACEAE
T	8	Adlumia	fungosa	FUMARIACEAE
*	0	**Aegilops**	**cylindrica**	POACEAE
*	0	**Aegopodium**	**podagraria**	APIACEAE
	6	Aesculus	glabra	HIPPOCASTANACEAE
*	0	**Aesculus**	**hippocastanum**	HIPPOCASTANACEAE

COMMENTS	C OF C	GENUS	SPECIFIC EPITHET	FAMILY
*	0	**Abutilon**	**theophrasti**	MALVACEAE
*	0	**Acalypha**	**ostryaefolia**	EUPHORBIACEAE
	0	Acalypha	rhomboidea	EUPHORBIACEAE
	0	Acalypha	virginica	EUPHORBIACEAE
	3	Acer	negundo	ACERACEAE
E	10	Acer	pensylvanicum	ACERACEAE
*	0	**Acer**	**platanoides**	ACERACEAE
	2	Acer	rubrum	ACERACEAE
	3	Acer	saccharinum	ACERACEAE
	6	Acer	saccharum	ACERACEAE
	8	Acer	spicatum	ACERACEAE
*	0	**Achillea**	**millefolium**	ASTERACEAE
E	10	Aconitum	noveboracense	RANUNCULACEAE
	4	Acorus	calamus	ACORACEAE
	7	Actaea	alba (A. pachypoda)	RANUNCULACEAE
T	9	Actaea	rubra	RANUNCULACEAE
	6	Adiantum	pedatum	ADIANTACEAE
T	8	Adlumia	fungosa	FUMARIACEAE
*	0	**Aegilops**	**cylindrica**	POACEAE
*	0	**Aegopodium**	**podagraria**	APIACEAE
	6	Aesculus	glabra	HIPPOCASTANACEAE
*	0	**Aesculus**	**hippocastanum**	HIPPOCASTANACEAE

*	0	**Aethusa**	**cynapium**	APIACEAE
E	8	Agalinis	auriculata (Tomanthera a.)	SCROPHULARIACEAE
E	10	Agalinis	purpurea var. parviflora	SCROPHULARIACEAE
	8	Agalinis	purpurea var. purpurea	SCROPHULARIACEAE
E	10	Agalinis	skinneriana	SCROPHULARIACEAE
	5	Agalinis	tenuifolia	SCROPHULARIACEAE
	4	Agastache	nepetoides	LAMIACEAE
	4	Agastache	scrophulariaefolia	LAMIACEAE
	3	Agrimonia	gryposepala	ROSACEAE
	2	Agrimonia	parviflora	ROSACEAE
	5	Agrimonia	pubescens	ROSACEAE
	5	Agrimonia	rostellata	ROSACEAE
	7	Agrimonia	striata	ROSACEAE
*	0	**Agrostemma**	**githago**	CARYOPHYLLACEAE
*	0	**Agrostis**	**capillaris (A. tenuis)**	POACEAE
*	0	**Agrostis**	**gigantea**	POACEAE
	2	Agrostis	hyemalis var. hyemalis	POACEAE
	3	Agrostis	hyemalis var. scabra	POACEAE
	4	Agrostis	perennans	POACEAE
*	0	**Ailanthus**	**altissima**	SIMAROUBACEAE
*	0	**Ajuga**	**reptans**	LAMIACEAE
*	0	**Alcea**	**rosea**	MALVACEAE
	8	Aletris	farinosa	LILIACEAE
	2	Alisma	subcordatum (A. plantago-aquatica)	ALISMATACEAE
	8	Alisma	triviale	ALISMATACEAE
*	0	**Alliaria**	**petiolata**	BRASSICACEAE
	3	Allium	canadense	LILIACEAE
	5	Allium	cernuum	LILIACEAE
*	0	**Allium**	**sativum**	LILIACEAE
*	0	**Allium**	**schoenoprasum**	LILIACEAE
	5	Allium	tricoccum	LILIACEAE
*	0	**Allium**	**vineale**	LILIACEAE
*	0	**Alnus**	**glutinosa**	BETULACEAE
	6	Alnus	incana (A. rugosa)	BETULACEAE

	6	Alnus	serrulata	BETULACEAE
	2	Alopecurus	aequalis	POACEAE
	0	Alopecurus	carolinianus	POACEAE
*	0	**Alopecurus**	**pratensis**	POACEAE
*	0	**Althaea**	**officinalis**	MALVACEAE
*	0	**Alyssum**	**alyssoides**	BRASSICACEAE
	0	Amaranthus	albus	AMARANTHACEAE
*	0	**Amaranthus**	**blitoides**	AMARANTHACEAE
*	0	**Amaranthus**	**blitum (A. lividus)**	AMARANTHACEAE
*	0	**Amaranthus**	**hybridus**	AMARANTHACEAE
*	0	**Amaranthus**	**retroflexus**	AMARANTHACEAE
*	0	**Amaranthus**	**rudis (A. tamariscinus)**	AMARANTHACEAE
*	0	**Amaranthus**	**tuberculatus**	AMARANTHACEAE
	0	Ambrosia	artemisiifolia	ASTERACEAE
*	0	**Ambrosia**	**psilostachya**	ASTERACEAE
	0	Ambrosia	trifida	ASTERACEAE
	5	Amelanchier	arborea	ROSACEAE
	10	Amelanchier	laevis	ROSACEAE
T	8	Amelanchier	sanguinea	ROSACEAE
	6	Amelanchier	spicata	ROSACEAE
	6	Ammannia	robusta	LYTHRACEAE
T	10	Ammophila	breviligulata	POACEAE
	2	Amorpha	fruticosa	FABACEAE
	3	Ampelamus	albidus (Cynanchum laeve)	ASCLEPIADACEAE
*	0	**Ampelopsis**	**brevipedunculata**	VITACEAE
	5	Amphicarpaea	bracteata	FABACEAE
*	0	**Anagallis**	**arvensis**	PRIMULACEAE
	6	Anaphalis	margaritacea	ASTERACEAE
*	0	**Anchusa**	**arvensis (Lycopsis a.)**	BORAGINACEAE
*	0	**Anchusa**	**azurea**	BORAGINACEAE
X	10	Andromeda	glaucophylla	ERICACEAE
	6	Andropogon	gerardii	POACEAE
	3	Andropogon	virginicus	POACEAE
T	10	Androsace	occidentalis	PRIMULACEAE

	5	Anemone	canadensis	RANUNCULACEAE
T	9	Anemone	cylindrica	RANUNCULACEAE
	5	Anemone	quinquefolia	RANUNCULACEAE
	3	Anemone	virginiana	RANUNCULACEAE
	6	Anemonella	thalictroides	RANUNCULACEAE
*	0	**Anethum**	**graveolens**	APIACEAE
	6	Angelica	atropurpurea	APIACEAE
	8	Angelica	venenosa	APIACEAE
*	0	**Anoda**	**cristata**	MALVACEAE
	2	Antennaria	neglecta var. neglecta	ASTERACEAE
	2	Antennaria	neglecta var. neodioica	ASTERACEAE
	1	Antennaria	plantaginifolia (A. parlinii)	ASTERACEAE
*	0	**Anthemis**	**arvensis**	ASTERACEAE
*	0	**Anthemis**	**cotula**	ASTERACEAE
*	0	**Anthemis**	**nobilis**	ASTERACEAE
*	0	**Anthemis**	**tinctoria**	ASTERACEAE
*	0	**Anthoxanthum**	**odoratum**	POACEAE
*	0	**Anthriscus**	**caucalis**	APIACEAE
*	0	**Anthriscus**	**sylvestris**	APIACEAE
*	0	**Antirrhinum**	**majus**	SCROPHULARIACEAE
*	0	**Apera**	**spica-venti**	POACEAE
	4	Apios	americana	FABACEAE
	8	Aplectrum	hyemale	ORCHIDACEAE
	6	Apocynum	androsaemifolium	APOCYNACEAE
	3	Apocynum	cannabinum	APOCYNACEAE
E	8	Apocynum	sibiricum	APOCYNACEAE
	3	Apocynum	x floribundum (A. medium)	APOCYNACEAE
	5	Aquilegia	canadensis	RANUNCULACEAE
*	0	**Aquilegia**	**vulgaris**	RANUNCULACEAE
*	0	**Arabidopsis**	**thaliana**	BRASSICACEAE
	7	Arabis	canadensis	BRASSICACEAE
E	10	Arabis	divaricarpa	BRASSICACEAE
E	9	Arabis	drummondii	BRASSICACEAE
	3	Arabis	glabra	BRASSICACEAE

	4	Arabis	hirsuta	BRASSICACEAE
	4	Arabis	laevigata	BRASSICACEAE
	6	Arabis	lyrata	BRASSICACEAE
	4	Arabis	perstellata	BRASSICACEAE
E	10	Aralia	hispida	ARALIACEAE
	5	Aralia	nudicaulis	ARALIACEAE
	8	Aralia	racemosa	ARALIACEAE
**	0	Aralia	spinosa	ARALIACEAE
*	0	**Arctium**	**lappa**	ASTERACEAE
*	0	**Arctium**	**minus**	ASTERACEAE
X	10	Arctostaphylos	uva-ursi	ERICACEAE
T	8	Arenaria	lateriflora	CARYOPHYLLACEAE
*	0	**Arenaria**	**serpyllifolia**	CARYOPHYLLACEAE
	10	Arenaria	stricta	CARYOPHYLLACEAE
E	10	Arethusa	bulbosa	ORCHIDACEAE
*	0	**Argemone**	**mexicana**	PAPAVERACEAE
	5	Arisaema	dracontium	ARACEAE
	9	Arisaema	triphyllum var. stewardsonii (A. stewardsonii)	ARACEAE
	4	Arisaema	triphyllum var. triphyllum (A. atrorubens)	ARACEAE
	2	Aristida	dichotoma	POACEAE
E	10	Aristida	longespica	POACEAE
	0	Aristida	oligantha	POACEAE
	8	Aristida	purpurascens	POACEAE
	7	Aristolochia	serpentaria	ARISTOLOCHIACEAE
E	8	Armoracia	lacustris (A. aquatica)	BRASSICACEAE
*	0	**Armoracia**	**rusticana**	BRASSICACEAE
	5	Aronia	melanocarpa (A. prunifolia)	ROSACEAE
*	0	**Arrhenatherum**	**elatius**	POACEAE
*	0	**Artemisia**	**absinthium**	ASTERACEAE
*	0	**Artemisia**	**annua**	ASTERACEAE
*	0	**Artemisia**	**biennis**	ASTERACEAE
T	10	Artemisia	campestris ssp. caudata	ASTERACEAE
*	0	**Artemisia**	**ludoviciana**	ASTERACEAE
*	0	**Artemisia**	**pontica**	ASTERACEAE

*	0	**Artemisia**	**vulgaris**	ASTERACEAE
	8	Aruncus	dioicus	ROSACEAE
*	0	**Arundinaria**	**gigantea**	POACEAE
	7	Asarum	canadense	ARISTOLOCHIACEAE
	7	Asclepias	amplexicaulis	ASCLEPIADACEAE
	8	Asclepias	exaltata	ASCLEPIADACEAE
	8	Asclepias	hirtella	ASCLEPIADACEAE
	5	Asclepias	incarnata	ASCLEPIADACEAE
	8	Asclepias	purpurascens	ASCLEPIADACEAE
	7	Asclepias	quadrifolia	ASCLEPIADACEAE
	0	Asclepias	syriaca	ASCLEPIADACEAE
	9	Asclepias	sullivantii	ASCLEPIADACEAE
	6	Asclepias	tuberosa	ASCLEPIADACEAE
	10	Asclepias	variegata	ASCLEPIADACEAE
	6	Asclepias	verticillata	ASCLEPIADACEAE
	7	Asclepias	viridiflora	ASCLEPIADACEAE
	6	Asimina	triloba	ANNONACEAE
*	0	**Asparagus**	**officinalis**	LILIACEAE
	8	Asplenium	montanum	ASPLENIACEAE
	8	Asplenium	pinnatifidum	ASPLENIACEAE
	5	Asplenium	platyneuron	ASPLENIACEAE
	8	Asplenium	rhizophyllus (Camptosorus r.)	ASPLENIACEAE
	8	Asplenium	trichomanes	ASPLENIACEAE
E	10	Aster	acuminatus	ASTERACEAE
	9	Aster	borealis (A. junciformis)	ASTERACEAE
*	0	**Aster**	**brachyactis**	ASTERACEAE
	5	Aster	cordifolius	ASTERACEAE
	5	Aster	divaricatus	ASTERACEAE
T	8	Aster	drummondii	ASTERACEAE
E	10	Aster	dumosus	ASTERACEAE
	3	Aster	ericoides	ASTERACEAE
	8	Aster	infirmus	ASTERACEAE
	6	Aster	laevis	ASTERACEAE
	2	Aster	lanceolatus (A. simplex)	ASTERACEAE

	2	Aster	lateriflorus	ASTERACEAE
	6	Aster	lowrieanus	ASTERACEAE
	5	Aster	macrophyllus	ASTERACEAE
	3	Aster	novae-angliae	ASTERACEAE
	7	Aster	oolentangiensis (A. azureus)	ASTERACEAE
	9	Aster	patens var. patens	ASTERACEAE
	5	Aster	patens var. phlogifolius	ASTERACEAE
	3	Aster	paternus	ASTERACEAE
	1	Aster	pilosus var. pilosus	ASTERACEAE
	3	Aster	pilosus var. pringlei	ASTERACEAE
	7	Aster	praealtus	ASTERACEAE
	3	Aster	prenanthoides	ASTERACEAE
	6	Aster	puniceus	ASTERACEAE
	2	Aster	racemosus (A. vimineus)	ASTERACEAE
	3	Aster	sagittifolius	ASTERACEAE
	5	Aster	schreberi	ASTERACEAE
	4	Aster	shortii	ASTERACEAE
*	0	**Aster**	**subulatus**	ASTERACEAE
	2	Aster	umbellatus	ASTERACEAE
	2	Aster	undulatus	ASTERACEAE
	3	Astragalus	canadensis	FABACEAE
E	10	Astragalus	neglectus	FABACEAE
	5	Athyrium	felix-femina	ASPLENIACEAE
	8	Athyrium	pycnocarpon	ASPLENIACEAE
	6	Athyrium	thelypteroides	ASPLENIACEAE
*	0	**Atriplex**	**argentea**	CHENOPODIACEAE
*	0	**Atriplex**	**littoralis (A. subspicata)**	CHENOPODIACEAE
	0	Atriplex	patula	CHENOPODIACEAE
*	0	**Atriplex**	**rosea**	CHENOPODIACEAE
	9	Aureolaria	flava	SCROPHULARIACEAE
E	10	Aureolaria	pedicularia var. ambigens	SCROPHULARIACEAE
	9	Aureolaria	virginica	SCROPHULARIACEAE
*	0	**Avena**	**fatua**	POACEAE
*	0	**Avena**	**sativa**	POACEAE

*	0	**Azolla**	**caroliniana**	SALVINIACEAE
T	8	Baptisia	lactea	FABACEAE
	8	Baptisia	tinctoria	FABACEAE
*	0	**Barbarea**	**verna**	BRASSICACEAE
*	0	**Barbarea**	**vulgaris**	BRASSICACEAE
	6	Bartonia	virginica	GENTIANACEAE
*	0	**Bellis**	**perennis**	ASTERACEAE
*	0	**Berberis**	**thunbergii**	BERBERIDACEAE
*	0	**Berberis**	**vulgaris**	BERBERIDACEAE
*	0	**Berteroa**	**incana**	BRASSICACEAE
	7	Betula	alleghaniensis	BETULACEAE
	7	Betula	lenta	BETULACEAE
*	0	**Betula**	**papyrifera**	BETULACEAE
*	0	**Betula**	**pendula**	BETULACEAE
	6	Betula	populifolia	BETULACEAE
T	10	Betula	pumila	BETULACEAE
*	0	**Betula**	**x purpusii**	BETULACEAE
	3	Bidens	aristosa	ASTERACEAE
X	10	Bidens	beckii (Megalodonta b.)	ASTERACEAE
	3	Bidens	bipinnata	ASTERACEAE
	3	Bidens	cernua	ASTERACEAE
	2	Bidens	connata (B. tripartita)	ASTERACEAE
	3	Bidens	coronata	ASTERACEAE
	7	Bidens	discoidea	ASTERACEAE
	2	Bidens	frondosa	ASTERACEAE
	6	Bidens	polylepis	ASTERACEAE
	2	Bidens	vulgata	ASTERACEAE
	4	Blephilia	ciliata	LAMIACEAE
	4	Blephilia	hirsuta	LAMIACEAE
	4	Boehmeria	cylindrica	URTICACEAE
	8	Boltonia	asteroides	ASTERACEAE
*	0	**Borago**	**officinalis**	BORAGINACEAE
	5	Botrychium	dissectum	OPHIOGLOSSACEAE
X	10	Botrychium	lanceolatum	OPHIOGLOSSACEAE

	5	Botrychium	matricariifolium	OPHIOGLOSSACEAE
T	10	Botrychium	multifidum	OPHIOGLOSSACEAE
	7	Botrychium	oneidense	OPHIOGLOSSACEAE
X	10	Botrychium	simplex	OPHIOGLOSSACEAE
	5	Botrychium	virginianum	OPHIOGLOSSACEAE
	7	Bouteloua	curtipendula	POACEAE
	6	Brachyelytrum	erectum	POACEAE
	8	Brasenia	schreberi	CABOMBACEAE
*	0	**Brassica**	**juncea**	BRASSICACEAE
*	0	**Brassica**	**napus**	BRASSICACEAE
*	0	**Brassica**	**nigra**	BRASSICACEAE
*	0	**Brassica**	**oleracea**	BRASSICACEAE
*	0	**Brassica**	**rapa**	BRASSICACEAE
	7	Bromus	altissimus (B. latiglumis)	POACEAE
	7	Bromus	ciliatus	POACEAE
*	0	**Bromus**	**commutatus**	POACEAE
*	0	**Bromus**	**hordeaceus (B. mollis)**	POACEAE
*	0	**Bromus**	**inermis**	POACEAE
*	0	**Bromus**	**japonicus**	POACEAE
	8	Bromus	kalmii	POACEAE
	4	Bromus	pubescens	POACEAE
*	0	**Bromus**	**secalinus**	POACEAE
*	0	**Bromus**	**sterilis**	POACEAE
*	0	**Bromus**	**tectorum**	POACEAE
E	8	Buchnera	americana	SCROPHULARIACEAE
	3	Bulbostylis	capillaris	CYPERACEAE
*	0	**Bunias**	**orientalis**	BRASSICACEAE
*	0	**Buxus**	**sempervirens**	BUXACEAE
*	0	**Cabomba**	**caroliniana**	CABOMBACEAE
	7	Cacalia	atriplicifolia	ASTERACEAE
	7	Cacalia	suaveolens	ASTERACEAE
	10	Cakile	edentula	BRASSICACEAE
	4	Calamagrostis	canadensis	POACEAE
	10	Calamagrostis	stricta (C. inexpansa)	POACEAE

	10	Calla	palustris	ARACEAE
	3	Callitriche	heterophylla	CALLITRICHACEAE
T	10	Callitriche	palustris	CALLITRICHACEAE
	8	Callitriche	terrestris	CALLITRICHACEAE
	10	Calopogon	tuberosus	ORCHIDACEAE
	5	Caltha	palustris	RANUNCULACEAE
*	0	**Calystegia**	**hederacea**	CONVOLVULACEAE
	1	Calystegia	sepium	CONVOLVULACEAE
	6	Calystegia	spithamaea	CONVOLVULACEAE
	5	Camassia	scilloides	LILIACEAE
*	0	**Camelina**	**microcarpa**	BRASSICACEAE
*	0	**Camelina**	**sativa**	BRASSICACEAE
	4	Campanula	americana	CAMPANULACEAE
	7	Campanula	aparinoides var. grandiflora	CAMPANULACEAE
*	0	**Campanula**	**rapunculoides**	CAMPANULACEAE
T	8	Campanula	rotundifolia	CAMPANULACEAE
**	0	Campsis	radicans	BIGNONIACEAE
*	0	**Cannabis**	**sativa**	CANNABACEAE
*	0	**Capsella**	**bursa-pastoris**	BRASSICACEAE
	8	Cardamine	angustata (Dentaria heterophylla)	BRASSICACEAE
	4	Cardamine	bulbosa	BRASSICACEAE
	3	Cardamine	concatenata (Dentaria laciniata)	BRASSICACEAE
	4	Cardamine	diphylla (Dentaria d.)	BRASSICACEAE
	5	Cardamine	douglassii	BRASSICACEAE
*	0	**Cardamine**	**hirsuta**	BRASSICACEAE
*	0	**Cardamine**	**impatiens**	BRASSICACEAE
	3	Cardamine	parviflora var. arenicola	BRASSICACEAE
	3	Cardamine	pensylvanica	BRASSICACEAE
	9	Cardamine	pratensis var. palustris	BRASSICACEAE
*	0	**Cardamine**	**pratensis var. pratensis**	BRASSICACEAE
	8	Cardamine	rotundifolia	BRASSICACEAE
*	0	**Cardaria**	**draba**	BRASSICACEAE
*	0	**Carduus**	**acanthoides**	ASTERACEAE
*	0	**Carduus**	**nutans**	ASTERACEAE

	8	Carex	alata	CYPERACEAE
	3	Carex	albicans var. albicans (C. artitecta)	CYPERACEAE
T	8	Carex	albicans var. emmonsii	CYPERACEAE
T	8	Carex	albolutescens	CYPERACEAE
	4	Carex	albursina	CYPERACEAE
	3	Carex	amphibola var. turgida	CYPERACEAE
T	9	Carex	aquatilis	CYPERACEAE
E	10	Carex	arctata	CYPERACEAE
T	7	Carex	argyrantha	CYPERACEAE
E	9	Carex	atherodes	CYPERACEAE
	8	Carex	atlantica var. atlantica	CYPERACEAE
	9	Carex	atlantica var. capillacea (C. howei)	CYPERACEAE
	9	Carex	aurea	CYPERACEAE
T	7	Carex	bebbii	CYPERACEAE
	3	Carex	blanda	CYPERACEAE
	4	Carex	brevior (incl. C. molesta)	CYPERACEAE
	5	Carex	bromoides	CYPERACEAE
T	9	Carex	brunnescens	CYPERACEAE
	10	Carex	buxbaumii	CYPERACEAE
	8	Carex	canescens	CYPERACEAE
	5	Carex	careyana	CYPERACEAE
	6	Carex	caroliniana	CYPERACEAE
	5	Carex	cephalophora	CYPERACEAE
	3	Carex	communis	CYPERACEAE
	2	Carex	comosa	CYPERACEAE
	2	Carex	complanata (C. hirsutella)	CYPERACEAE
	5	Carex	conjuncta	CYPERACEAE
T	8	Carex	conoidea	CYPERACEAE
	5	Carex	convoluta	CYPERACEAE
	8	Carex	crawei	CYPERACEAE
	2	Carex	crinita	CYPERACEAE
	3	Carex	cristatella	CYPERACEAE
E	10	Carex	crus-corvi	CYPERACEAE
	9	Carex	cryptolepis	CYPERACEAE

	6	Carex	davisii	CYPERACEAE
	8	Carex	debilis var. rudgei	CYPERACEAE
E	10	Carex	decomposita	CYPERACEAE
X	10	Carex	deweyana	CYPERACEAE
	9	Carex	diandra	CYPERACEAE
	4	Carex	digitalis	CYPERACEAE
E	10	Carex	disperma	CYPERACEAE
	10	Carex	eburnea	CYPERACEAE
E	10	Carex	echinata (C. cephalantha)	CYPERACEAE
	6	Carex	emoryi	CYPERACEAE
	6	Carex	festucacea	CYPERACEAE
	10	Carex	flaccosperma (C. glaucodea)	CYPERACEAE
	10	Carex	flava	CYPERACEAE
	7	Carex	folliculata	CYPERACEAE
X	10	Carex	formosa	CYPERACEAE
	5	Carex	frankii	CYPERACEAE
	3	Carex	gracilescens	CYPERACEAE
	4	Carex	gracillima	CYPERACEAE
	3	Carex	granularis	CYPERACEAE
	5	Carex	grayi	CYPERACEAE
X	10	Carex	haydenii	CYPERACEAE
	3	Carex	hirtifolia	CYPERACEAE
	7	Carex	hitchcockiana	CYPERACEAE
	8	Carex	hyalinolepis	CYPERACEAE
	4	Carex	hystericina	CYPERACEAE
	8	Carex	interior	CYPERACEAE
	5	Carex	intumescens	CYPERACEAE
	7	Carex	jamesii	CYPERACEAE
	5	Carex	lacustris	CYPERACEAE
	5	Carex	laevivaginata	CYPERACEAE
T	10	Carex	lasiocarpa	CYPERACEAE
	3	Carex	laxiculmis	CYPERACEAE
	3	Carex	laxiflora	CYPERACEAE
	6	Carex	leavenworthii	CYPERACEAE

	5	Carex	leptalea	CYPERACEAE
	6	Carex	leptonervia	CYPERACEAE
E	10	Carex	limosa	CYPERACEAE
E	10	Carex	longii	CYPERACEAE
X	10	Carex	louisianica	CYPERACEAE
T	10	Carex	lupuliformis	CYPERACEAE
	3	Carex	lupulina	CYPERACEAE
	3	Carex	lurida	CYPERACEAE
	7	Carex	meadii	CYPERACEAE
	6	Carex	muhlenbergii	CYPERACEAE
	8	Carex	muskingumensis	CYPERACEAE
	4	Carex	normalis	CYPERACEAE
	8	Carex	oligocarpa	CYPERACEAE
T	10	Carex	oligosperma	CYPERACEAE
T	10	Carex	pallescens	CYPERACEAE
	7	Carex	pedunculata	CYPERACEAE
	6	Carex	pellita (C. lanuginosa)	CYPERACEAE
	3	Carex	pensylvanica	CYPERACEAE
	8	Carex	plantaginea	CYPERACEAE
	7	Carex	platyphylla	CYPERACEAE
*	0	**Carex**	**praegracilis**	CYPERACEAE
	9	Carex	prairea	CYPERACEAE
	8	Carex	prasina	CYPERACEAE
T	8	Carex	projecta	CYPERACEAE
T	8	Carex	radiata	CYPERACEAE
T	8	Carex	retroflexa	CYPERACEAE
E	9	Carex	retrorsa	CYPERACEAE
X	10	Carex	richardsonii	CYPERACEAE
	3	Carex	rosea	CYPERACEAE
	9	Carex	rugosperma	CYPERACEAE
T	9	Carex	sartwellii	CYPERACEAE
	7	Carex	scabrata	CYPERACEAE
	4	Carex	scoparia	CYPERACEAE
	9	Carex	seorsa	CYPERACEAE

	5	Carex	shortiana	CYPERACEAE
	9	Carex	siccata (C. foenea)	CYPERACEAE
	2	Carex	sparganioides var. aggregata	CYPERACEAE
	3	Carex	sparganioides var. sparganioides	CYPERACEAE
E	8	Carex	sparganoides var. cephaloidea	CYPERACEAE
E	10	Carex	sprengelii	CYPERACEAE
	5	Carex	squarrosa	CYPERACEAE
	8	Carex	sterilis	CYPERACEAE
	2	Carex	stipata	CYPERACEAE
T	9	Carex	straminea	CYPERACEAE
	6	Carex	stricta	CYPERACEAE
	9	Carex	suberecta	CYPERACEAE
	4	Carex	swanii	CYPERACEAE
	6	Carex	tenera	CYPERACEAE
X	10	Carex	tenuiflora	CYPERACEAE
	8	Carex	tetanica	CYPERACEAE
	6	Carex	torta	CYPERACEAE
	4	Carex	tribuloides	CYPERACEAE
	9	Carex	trichocarpa	CYPERACEAE
	9	Carex	trisperma	CYPERACEAE
	8	Carex	tuckermanii	CYPERACEAE
	6	Carex	typhina	CYPERACEAE
	9	Carex	umbellata	CYPERACEAE
	7	Carex	utriculata (C. rostrata)	CYPERACEAE
	7	Carex	vesicaria	CYPERACEAE
	6	Carex	virescens	CYPERACEAE
	10	Carex	viridula	CYPERACEAE
	6	Carex	vulpinoidea var. ambigua (C. annectens)	CYPERACEAE
	3	Carex	vulpinoidea var. vulpinoidea	CYPERACEAE
	7	Carex	willdenowii	CYPERACEAE
	7	Carex	woodii	CYPERACEAE
	4	Carpinus	caroliniana	BETULACEAE
*	0	**Carum**	**carvi**	APIACEAE
	4	Carya	cordiformis	JUGLANDACEAE

	5	Carya	glabra	JUGLANDACEAE
	7	Carya	laciniosa	JUGLANDACEAE
	5	Carya	ovalis	JUGLANDACEAE
	6	Carya	ovata	JUGLANDACEAE
	6	Carya	tomentosa	JUGLANDACEAE
	6	Castanea	dentata	FAGACEAE
	8	Castilleja	coccinea	SCROPHULARIACEAE
*	0	**Catalpa**	**bignonioides**	BIGNONIACEAE
*	0	**Catalpa**	**ovata**	BIGNONIACEAE
*	0	**Catalpa**	**speciosa**	BIGNONIACEAE
	6	Caulophyllum	thalictroides var. giganteum	BERBERIDACEAE
	6	Caulophyllum	thalictroides var. thalictroides	BERBERIDACEAE
	6	Ceanothus	americanus	RHAMNACEAE
E	10	Ceanothus	herbaceus	RHAMNACEAE
	3	Celastrus	scandens	CELASTRACEAE
	6	Celtis	occidentalis	ULMACEAE
	8	Celtis	tenuifolia	ULMACEAE
	3	Cenchrus	longispinus	POACEAE
*	0	**Centaurea**	**cyanus**	ASTERACEAE
*	0	**Centaurea**	**dubia**	ASTERACEAE
*	0	**Centaurea**	**jacea**	ASTERACEAE
*	0	**Centaurea**	**maculosa**	ASTERACEAE
*	0	**Centaurea**	**nigra**	ASTERACEAE
*	0	**Centaurea**	**solstitialis**	ASTERACEAE
*	0	**Centaurium**	**pulchellum**	GENTIANACEAE
*	0	**Centunculus**	**minimus**	PRIMULACEAE
	7	Cephanlanthus	occidentalis	RUBIACEAE
	2	Cerastium	arvense	CARYOPHYLLACEAE
*	0	**Cerastium**	**conglomeratum**	CARYOPHYLLACEAE
	4	Cerastium	nutans	CARYOPHYLLACEAE
*	0	**Cerastium**	**tomentosum**	CARYOPHYLLACEAE
*	0	**Cerastium**	**viscosum**	CARYOPHYLLACEAE
*	0	**Cerastium**	**vulgatum (C. fontanum)**	CARYOPHYLLACEAE
	5	Ceratophyllum	demersum	CERATOPHYLLACEAE

	7	Ceratophyllum	echinatum	CERATOPHYLLACEAE
**	0	Cercis	canadensis	CAESALPINIACEAE
*	0	**Chaenomeles**	**lagenaria**	ROSACEAE
*	0	**Chaenorrhinum**	**minus**	SCROPHULARIACEAE
	4	Chaerophyllum	procumbens var. procumbens	APIACEAE
	8	Chaerophyllum	procumbens var. shortii	APIACEAE
	3	Chamaecrista	fasciculata (Cassia chamaecrista)	CAESALPINIACEAE
	10	Chamaedaphne	calyculata	ERICACEAE
	8	Chamaelirium	luteum	LILIACEAE
*	0	**Chelidonium**	**majus**	PAPAVERACEAE
	8	Chelone	glabra	SCROPHULARIACEAE
*	0	**Chenopodium**	**album**	CHENOPODIACEAE
*	0	**Chenopodium**	**ambrosioides**	CHENOPODIACEAE
*	0	**Chenopodium**	**botrys**	CHENOPODIACEAE
	10	Chenopodium	capitatum	CHENOPODIACEAE
	3	Chenopodium	gigantospermum (C. hybridum)	CHENOPODIACEAE
*	0	**Chenopodium**	**glaucum**	CHENOPODIACEAE
E	8	Chenopodium	leptophyllum	CHENOPODIACEAE
*	0	**Chenopodium**	**murale**	CHENOPODIACEAE
	6	Chenopodium	standleyanum	CHENOPODIACEAE
*	0	**Chenopodium**	**urbicum**	CHENOPODIACEAE
*	0	**Chenopodium**	**vulvaria**	CHENOPODIACEAE
	7	Chimaphila	maculata	PYROLACEAE
T	9	Chimaphila	umbellata	PYROLACEAE
*	0	**Chorispora**	**tenella**	BRASSICACEAE
*	0	**Chrysanthemum**	**balsamita**	ASTERACEAE
*	0	**Chrysanthemum**	**leucanthemum**	ASTERACEAE
*	0	**Chrysanthemum**	**maximum**	ASTERACEAE
*	0	**Chrysanthemum**	**parthenium**	ASTERACEAE
T	6	Chrysogonum	virginianum	ASTERACEAE
*	0	**Chrysopsis**	**camporum**	ASTERACEAE
	6	Chrysosplenium	americanum	SAXIFRAGACEAE
*	0	**Cichorium**	**intybus**	ASTERACEAE
	4	Cicuta	bulbifera	APIACEAE

	3	Cicuta	maculata	APIACEAE
	8	Cimicifuga	racemosa	RANUNCULACEAE
	4	Cinna	arundinacea	POACEAE
E	9	Cinna	latifolia	POACEAE
	9	Circaea	alpina	ONAGRACEAE
	3	Circaea	lutetiana	ONAGRACEAE
	5	Circaea	x intermedia	ONAGRACEAE
	5	Cirsium	altissimum	ASTERACEAE
*	0	**Cirsium**	**arvense**	ASTERACEAE
	6	Cirsium	discolor	ASTERACEAE
	8	Cirsium	muticum	ASTERACEAE
*	0	**Cirsium**	**plattense**	ASTERACEAE
	8	Cirsium	pumilum	ASTERACEAE
*	0	**Cirsium**	**vulgare**	ASTERACEAE
*	0	**Citrullus**	**lanatus**	CUCURBITACEAE
	10	Cladium	mariscoides	CYPERACEAE
	8	Claytonia	caroliniana	PORTULACACEAE
	3	Claytonia	virginica	PORTULACACEAE
*	0	**Clematis**	**terniflora (C. dioscoreifolia)**	RANUNCULACEAE
	3	Clematis	virginiana	RANUNCULACEAE
*	0	**Cleome**	**hassleriana**	CAPPARACEAE
E	10	Clintonia	borealis	LILIACEAE
T	8	Clintonia	umbellulata	LILIACEAE
	6	Collinsia	verna	SCROPHULARIACEAE
	5	Collinsonia	canadensis	LAMIACEAE
	7	Comandra	umbellata	SANTALACEAE
*	0	**Commelina**	**communis**	COMMELINACEAE
*	0	**Commelina**	**diffusa**	COMMELINACEAE
T	8	Comptonia	peregrina	MYRICACEAE
	10	Conioselinum	chinense	APIACEAE
*	0	**Conium**	**maculatum**	APIACEAE
	7	Conopholis	americana	OROBANCHACEAE
*	0	**Conringia**	**orientalis**	BRASSICACEAE
*	0	**Convallaria**	**majalis**	LILIACEAE

*	0	**Convolvulus**	**arvensis**	CONVOLVULACEAE
	0	Conyza	canadensis	ASTERACEAE
E	7	Conyza	ramosissima	ASTERACEAE
	10	Coptis	trifolia	RANUNCULACEAE
	7	Corallorhiza	maculata	ORCHIDACEAE
	5	Corallorhiza	odontorhiza	ORCHIDACEAE
E	9	Corallorhiza	trifida	ORCHIDACEAE
*	0	**Coreopsis**	**grandiflora**	ASTERACEAE
*	0	**Coreopsis**	**lanceolata**	ASTERACEAE
*	0	**Coreopsis**	**tinctoria**	ASTERACEAE
	7	Coreopsis	tripteris	ASTERACEAE
*	0	**Corispermum**	**hyssopifolium**	CHENOPODIACEAE
*	0	**Corispermum**	**nitidum**	CHENOPODIACEAE
	5	Cornus	alternifolia	CORNACEAE
	2	Cornus	amomum	CORNACEAE
T	9	Cornus	canadensis	CORNACEAE
	4	Cornus	drummondii	CORNACEAE
	5	Cornus	florida	CORNACEAE
	2	Cornus	racemosa	CORNACEAE
	7	Cornus	rugosa	CORNACEAE
	4	Cornus	sericea (C. stolonifera)	CORNACEAE
*	0	**Coronilla**	**varia**	FABACEAE
	7	Corydalis	flavula	FUMARIACEAE
	9	Corydalis	sempervirens	FUMARIACEAE
	5	Corylus	americana	BETULACEAE
X	10	Corylus	cornuta	BETULACEAE
*	0	**Cosmos**	**bipinnatus**	ASTERACEAE
*	0	**Cotinus**	**coggygria**	ANACARDIACEAE
X	10	Crataegus	brainerdii	ROSACEAE
	6	Crataegus	calpodendron	ROSACEAE
	7	Crataegus	chrysocarpa (C. rotundifolia)	ROSACEAE
	4	Crataegus	coccinea	ROSACEAE
	3	Crataegus	crus-galli	ROSACEAE
	3	Crataegus	flabellata	ROSACEAE

	7	Crataegus	intricata	ROSACEAE
	3	Crataegus	mollis	ROSACEAE
*	0	**Crataegus**	**monogyna**	ROSACEAE
	2	Crataegus	pruinosa	ROSACEAE
	3	Crataegus	punctata	ROSACEAE
	4	Crataegus	succulenta	ROSACEAE
*	0	**Crepis**	**capillaris**	ASTERACEAE
*	0	**Crepis**	**pulchra**	ASTERACEAE
*	0	**Crepis**	**tectorum**	ASTERACEAE
*	0	**Croton**	**glandulosus**	EUPHORBIACEAE
*	0	**Croton**	**monanthogynus**	EUPHORBIACEAE
	3	Cryptotaenia	canadensis	APIACEAE
	6	Cuphea	viscosissima	LYTHRACEAE
	9	Cuscuta	cephalanthi	CUSCUTACEAE
E	8	Cuscuta	coryli	CUSCUTACEAE
*	0	**Cuscuta**	**epilinum**	CUSCUTACEAE
*	0	**Cuscuta**	**epithymum**	CUSCUTACEAE
	3	Cuscuta	gronovii	CUSCUTACEAE
	5	Cuscuta	pentagona (incl. C. campestre)	CUSCUTACEAE
	7	Cuscuta	polygonorum	CUSCUTACEAE
*	0	**Cycloloma**	**atriplicfolium**	CHENOPODIACEAE
*	0	**Cymbalaria**	**muralis**	SCROPHULARIACEAE
*	0	**Cynodon**	**dactylon**	POACEAE
*	0	**Cynoglossum**	**officinale**	BORAGINACEAE
X	10	Cynoglossum	virginianum var. boreale	BORAGINACEAE
	7	Cynoglossum	virginianum var. virginianum	BORAGINACEAE
*	0	**Cynosurus**	**cristatus**	POACEAE
*	0	**Cynosurus**	**echinatus**	POACEAE
E	10	Cyperus	acuminatus	CYPERACEAE
	3	Cyperus	bipartitus (C. rivularis)	CYPERACEAE
	8	Cyperus	diandrus	CYPERACEAE
	4	Cyperus	erythrorhizos	CYPERACEAE
	2	Cyperus	esculentus	CYPERACEAE
	3	Cyperus	filiculmis	CYPERACEAE

	3	Cyperus	flavescens	CYPERACEAE
X	10	Cyperus	houghtonii	CYPERACEAE
	5	Cyperus	odoratus (incl. C. engelmanii and C. ferruginescens)	CYPERACEAE
	9	Cyperus	schweinitzii	CYPERACEAE
	3	Cyperus	squarrosus (C. inflexus)	CYPERACEAE
	2	Cyperus	strigosus	CYPERACEAE
	6	Cyperus	tenuifolius	CYPERACEAE
	10	Cypripedium	acaule	ORCHIDACEAE
E	10	Cypripedium	calceolus var. parviflorum	ORCHIDACEAE
	8	Cypripedium	calceolus var. pubescens	ORCHIDACEAE
E	10	Cypripedium	candidum	ORCHIDACEAE
T	10	Cypripedium	reginae	ORCHIDACEAE
	7	Cystopteris	bulbifera	ASPLENIACEAE
	5	Cystopteris	fragilis	ASPLENIACEAE
	5	Cystopteris	protrusa	ASPLENIACEAE
*	0	**Dactylis**	**glomerata**	POACEAE
*	0	**Dalea**	**purpurea**	FABACEAE
T	10	Dalibarda	repens	ROSACEAE
	8	Danthonia	compressa	POACEAE
	3	Danthonia	spicata	POACEAE
	8	Dasistoma	macrophylla	SCROPHULARIACEAE
*	0	**Datura**	**inoxia**	SOLANACEAE
*	0	**Datura**	**stramonium**	SOLANACEAE
*	0	**Daucus**	**carota**	APIACEAE
	6	Decodon	verticillatus	LYTHRACEAE
*	0	**Delphinium**	**ambiguum (Consolida a.)**	RANUNCULACEAE
	8	Delphinium	exaltatum	RANUNCULACEAE
	4	Delphinium	tricorne	RANUNCULACEAE
	5	Dennstaedtia	punctilobula	DENNSTAEDTIACEAE
	10	Deschampsia	cespitosa	POACEAE
T	8	Deschampsia	flexuosa	POACEAE
T	7	Descurainia	pinnata	BRASSICACEAE
*	0	**Descurainia**	**sophia**	BRASSICACEAE
	9	Desmanthus	illinoensis	MIMOSACEAE

	5	Desmodium	canadense	FABACEAE
	5	Desmodium	canescens	FABACEAE
	6	Desmodium	ciliare (D. obtusum)	FABACEAE
	4	Desmodium	cuspidatum	FABACEAE
	5	Desmodium	glutinosum	FABACEAE
E	10	Desmodium	illinoense	FABACEAE
	9	Desmodium	laevigatum	FABACEAE
	5	Desmodium	nudiflorum	FABACEAE
	4	Desmodium	paniculatum	FABACEAE
	6	Desmodium	rotundifolium	FABACEAE
E	8	Desmodium	sessilifolium	FABACEAE
	6	Desmodium	viridiflorum	FABACEAE
*	0	**Dianthus**	**armeria**	CARYOPHYLLACEAE
*	0	**Dianthus**	**barbatus**	CARYOPHYLLACEAE
*	0	**Dianthus**	**deltoides**	CARYOPHYLLACEAE
	8	Diarrhena	americana	POACEAE
	7	Dicentra	canadensis	FUMARIACEAE
	7	Dicentra	cucullaria	FUMARIACEAE
	6	Diervilla	lonicera	CAPRIFOLIACEAE
*	0	**Digitalis**	**grandiflora**	SCROPHULARIACEAE
*	0	**Digitalis**	**lanata**	SCROPHULARIACEAE
*	0	**Digitaria**	**ischaemum**	POACEAE
*	0	**Digitaria**	**sanguinalis**	POACEAE
*	0	**Dioscorea**	**batatas**	DIOSCOREACEAE
	4	Dioscorea	villosa	DIOSCOREACEAE
	3	Diospyros	virginiana	EBENACEAE
*	0	**Diplotaxis**	**muralis**	BRASSICACEAE
*	0	**Diplotaxis**	**tenuifolia**	BRASSICACEAE
*	0	**Dipsacus**	**fullonum**	DIPSACACEAE
*	0	**Dipsacus**	**laciniatus**	DIPSACACEAE
*	0	**Dipsacus**	**sativus**	DIPSACACEAE
	7	Dirca	palustris	THYMELAEACEAE
	8	Disporum	lanuginosum	LILIACEAE
	10	Dodecatheon	meadia	PRIMULACEAE

E	7	Draba	reptans	BRASSICACEAE
*	0	**Draba**	**verna (Erophila v.)**	BRASSICACEAE
*	0	**Dracocephalum**	**parviflorum**	LAMIACEAE
E	10	Drosera	intermedia	DROSERACEAE
	7	Drosera	rotundifolia	DROSERACEAE
	5	Dryopteris	carthusiana (D. spinulosa)	ASPLENIACEAE
T	8	Dryopteris	clintoniana	ASPLENIACEAE
	8	Dryopteris	cristata	ASPLENIACEAE
	6	Dryopteris	goldiana	ASPLENIACEAE
	5	Dryopteris	intermedia	ASPLENIACEAE
	5	Dryopteris	marginalis	ASPLENIACEAE
	4	Dryopteris	x boottii	ASPLENIACEAE
	4	Dryopteris	x neo-wherryi	ASPLENIACEAE
	4	Dryopteris	x triploidea	ASPLENIACEAE
*	0	**Duchesnea**	**indica**	ROSACEAE
	6	Dulichium	arundinaceum	CYPERACEAE
*	0	**Dyssodia**	**papposa**	ASTERACEAE
	8	Echinacea	purpurea	ASTERACEAE
*	0	**Echinochloa**	**crusgalli**	POACEAE
	2	Echinochloa	muricata	POACEAE
	7	Echinochloa	walteri	POACEAE
	3	Echinocystis	lobata	CUCURBITACEAE
*	0	**Echium**	**vulgare**	BORAGINACEAE
*	0	**Eclipta**	**prostrata (E. alba)**	ASTERACEAE
*	0	**Elaeagnus**	**angustifolia**	ELAEAGNACEAE
*	0	**Elaeagnus**	**umbellata**	ELAEAGNACEAE
	3	Eleocharis	acicularis	CYPERACEAE
E	9	Eleocharis	caribaea	CYPERACEAE
T	9	Eleocharis	compressa	CYPERACEAE
T	8	Eleocharis	flavescens var. olivacea (E. olivacea)	CYPERACEAE
	8	Eleocharis	intermedia	CYPERACEAE
	2	Eleocharis	ovata (E. obtusa)	CYPERACEAE
	4	Eleocharis	palustris (incl. E. erythropoda and E. smallii)	CYPERACEAE
T	9	Eleocharis	pauciflora	CYPERACEAE

	9	Eleocharis	quadrangulata	CYPERACEAE
	10	Eleocharis	rostellata	CYPERACEAE
	8	Eleocharis	tenuis var. borealis (E.elliptica)	CYPERACEAE
*	0	**Eleusine**	**indica**	POACEAE
	2	Elodea	canadensis	HYDROCHARITACEAE
	5	Elodea	nuttallii	HYDROCHARITACEAE
	3	Elymus	canadensis	POACEAE
	5	Elymus	hystrix (Hystrix patula)	POACEAE
	5	Elymus	riparius	POACEAE
T	8	Elymus	trachycaulus (Agropyron t.)	POACEAE
	4	Elymus	villosus	POACEAE
	3	Elymus	virginicus	POACEAE
*	0	**Elytrigia**	**repens (Agropyron r.)**	POACEAE
*	0	**Elytrigia**	**smithii (Agropyron s.)**	POACEAE
	8	Epifagus	virginiana	OROBANCHACEAE
	8	Epigaea	repens	ERICACEAE
E	8	Epilobium	angustifolium	ONAGRACEAE
	4	Epilobium	ciliatum	ONAGRACEAE
	2	Epilobium	coloratum	ONAGRACEAE
*	0	**Epilobium**	**hirsutum**	ONAGRACEAE
	7	Epilobium	leptophyllum	ONAGRACEAE
*	0	**Epilobium**	**parviflorum**	ONAGRACEAE
T	9	Epilobium	strictum	ONAGRACEAE
*	0	**Epipactis**	**helleborine**	ORCHIDACEAE
	0	Equisetum	arvense	EQUISETACEAE
	7	Equisetum	fluviatile	EQUISETACEAE
	2	Equisetum	hyemale	EQUISETACEAE
	8	Equisetum	laevigatum	EQUISETACEAE
T	7	Equisetum	sylvaticum	EQUISETACEAE
T	8	Equisetum	variegatum	EQUISETACEAE
	4	Equisetum	x ferrissii	EQUISETACEAE
	4	Equisetum	x nelsonii	EQUISETACEAE
	5	Eragrostis	capillaris	POACEAE
*	0	**Eragrostis**	**cilianensis**	POACEAE

*	0	**Eragrostis**	**curvula**	POACEAE
	3	Eragrostis	frankii	POACEAE
	4	Eragrostis	hypnoides	POACEAE
*	0	**Eragrostis**	**minor (E. poaeoides)**	POACEAE
	2	Eragrostis	pectinacea	POACEAE
*	0	**Eragrostis**	**pilosa**	POACEAE
	2	Eragrostis	spectabilis	POACEAE
	3	Erechtites	hieracifolia	ASTERACEAE
*	0	**Erica**	**tetralix**	ERICACEAE
	6	Erigenia	bulbosa	APIACEAE
	1	Erigeron	annuus	ASTERACEAE
	2	Erigeron	philadelphicus	ASTERACEAE
	6	Erigeron	pulchellus	ASTERACEAE
	1	Erigeron	strigosus	ASTERACEAE
E	10	Eriocaulon	aquaticum (E. septangulare)	ERIOCAULACEAE
	10	Eriophorum	virginicum	CYPERACEAE
	10	Eriophorum	viridicarinatum	CYPERACEAE
*	0	**Erodium**	**cicutarium**	GERANIACEAE
*	0	**Erucastrum**	**gallicum**	BRASSICACEAE
	10	Eryngium	yuccifolium	APIACEAE
*	0	**Erysimum**	**cheiranthoides**	BRASSICACEAE
*	0	**Erysimum**	**inconspicuum**	BRASSICACEAE
*	0	**Erysimum**	**repandum**	BRASSICACEAE
	5	Erythronium	albidum	LILIACEAE
	5	Erythronium	americanum	LILIACEAE
*	0	**Euonymus**	**alatus**	CELASTRACEAE
	4	Euonymus	atropurpureus	CELASTRACEAE
*	0	**Euonymus**	**europaeus**	CELASTRACEAE
*	0	**Euonymus**	**fortunei**	CELASTRACEAE
	5	Euonymus	obovatus	CELASTRACEAE
	3	Eupatorium	altissimum	ASTERACEAE
	5	Eupatorium	fistulosum	ASTERACEAE
	6	Eupatorium	maculatum	ASTERACEAE
	3	Eupatorium	perfoliatum	ASTERACEAE

	7	Eupatorium	purpureum	ASTERACEAE
	4	Eupatorium	rugosum	ASTERACEAE
	3	Eupatorium	serotinum	ASTERACEAE
	3	Eupatorium	sessilifolium	ASTERACEAE
	5	Euphorbia	commutata	EUPHORBIACEAE
	4	Euphorbia	corollata	EUPHORBIACEAE
*	0	**Euphorbia**	**cyathophora**	EUPHORBIACEAE
*	0	**Euphorbia**	**cyparissias**	EUPHORBIACEAE
*	0	**Euphorbia**	**dentata**	EUPHORBIACEAE
*	0	**Euphorbia**	**esula**	EUPHORBIACEAE
*	0	**Euphorbia**	**falcata**	EUPHORBIACEAE
*	0	**Euphorbia**	**lathyris**	EUPHORBIACEAE
	0	Euphorbia	maculata	EUPHORBIACEAE
*	0	**Euphorbia**	**marginata**	EUPHORBIACEAE
	0	Euphorbia	nutans	EUPHORBIACEAE
	6	Euphorbia	obtusata	EUPHORBIACEAE
*	0	**Euphorbia**	**peplus**	EUPHORBIACEAE
*	0	**Euphorbia**	**platyphyllos**	EUPHORBIACEAE
	10	Euphorbia	polygonifolia	EUPHORBIACEAE
*	0	**Euphorbia**	**prostrata**	EUPHORBIACEAE
E	8	Euphorbia	serpens	EUPHORBIACEAE
	1	Euphorbia	vermiculata	EUPHORBIACEAE
	2	Euthamia	graminifolia	ASTERACEAE
T	9	Euthamia	remota (Solidago gymnospermoides)	ASTERACEAE
*	0	**Fagopyrum**	**esculentum**	POLYGONACEAE
	6	Fagus	grandifolia	FAGACEAE
*	0	**Festuca**	**elatior (F. arundinacea)**	POACEAE
*	0	**Festuca**	**ovina**	POACEAE
*	0	**Festuca**	**pratensis**	POACEAE
	0	Festuca	rubra	POACEAE
	5	Festuca	subverticillata (F. obtusa)	POACEAE
	8	Filipendula	rubra	ROSACEAE
*	0	**Filipendula**	**ulmaria**	ROSACEAE
	4	Fimbristylis	autumnalis	CYPERACEAE

	4	Floerkea	proserpinacoides	LIMNANTHACEAE
*	0	**Foeniculum**	**vulgare**	APIACEAE
*	0	**Forsythia**	**x intermedia**	OLEACEAE
	2	Fragaria	virginiana	ROSACEAE
	4	Fragaria	vesca	ROSACEAE
	8	Frasera	caroliniensis (Swertia c.)	GENTIANACEAE
	4	Fraxinus	americana	OLEACEAE
	7	Fraxinus	nigra	OLEACEAE
	6	Fraxinus	pennsylvanica var. pennsylvanica	OLEACEAE
	6	Fraxinus	pennsylvanica var. subintegerrima	OLEACEAE
T	8	Fraxinus	profunda (F. tomentosa)	OLEACEAE
	8	Fraxinus	quadrangulata	OLEACEAE
*	0	**Froelichia**	**gracilis**	AMARANTHACEAE
*	0	**Fumaria**	**officinalis**	FUMARIACEAE
*	0	**Gaillardia**	**pulchella**	ASTERACEAE
*	0	**Galeopsis**	**tetrahit**	LAMIACEAE
*	0	**Galinsoga**	**parviflora**	ASTERACEAE
*	0	**Galinsoga**	**quadriradiata**	ASTERACEAE
	2	Galium	aparine	RUBIACEAE
	3	Galium	asprellum	RUBIACEAE
	8	Galium	boreale	RUBIACEAE
	5	Galium	circaezans	RUBIACEAE
	4	Galium	concinnum	RUBIACEAE
E	10	Galium	labradoricum	RUBIACEAE
	6	Galium	lanceolatum	RUBIACEAE
*	0	**Galium**	**mollugo**	RUBIACEAE
	5	Galium	obtusum	RUBIACEAE
*	0	**Galium**	**odoratum**	RUBIACEAE
E	9	Galium	palustre	RUBIACEAE
*	0	**Galium**	**pedemontanum**	RUBIACEAE
	4	Galium	pilosum	RUBIACEAE
	6	Galium	tinctorium	RUBIACEAE
	7	Galium	trifidum	RUBIACEAE
	5	Galium	triflorum	RUBIACEAE

*	0	**Gallium**	**verum**	RUBIACEAE
X	10	Gaultheria	hispidula	ERICACEAE
	5	Gaultheria	procumbens	ERICACEAE
	2	Gaura	biennis var. biennis	ONAGRACEAE
*	0	**Gaura**	**biennis var. pitcheri (G. longiflora)**	ONAGRACEAE
*	0	**Gaura**	**parviflora**	ONAGRACEAE
	7	Gaylussacia	baccata	ERICACEAE
	6	Gentiana	andrewsii	GENTIANACEAE
	8	Gentiana	clausa	GENTIANACEAE
E	10	Gentiana	flavida (G. alba)	GENTIANACEAE
E	10	Gentiana	puberulenta	GENTIANACEAE
E	10	Gentiana	saponaria	GENTIANACEAE
	9	Gentianella	quinquefolia (Gentiana q.)	GENTIANACEAE
	8	Gentianopsis	crinita (Gentiana c.)	GENTIANACEAE
	8	Gentianopsis	procera (Gentiana p.)	GENTIANACEAE
E	9	Geranium	bicknellii	GERANIACEAE
	4	Geranium	carolinianum	GERANIACEAE
*	0	**Geranium**	**dissectum**	GERANIACEAE
	4	Geranium	maculatum	GERANIACEAE
*	0	**Geranium**	**molle**	GERANIACEAE
*	0	**Geranium**	**pusillum**	GERANIACEAE
	3	Geranium	robertianum	GERANIACEAE
*	0	**Geranium**	**sanguineum**	GERANIACEAE
	3	Geum	aleppicum	ROSACEAE
	2	Geum	canadense	ROSACEAE
	2	Geum	laciniatum	ROSACEAE
	9	Geum	rivale	ROSACEAE
	4	Geum	vernum	ROSACEAE
	4	Geum	virginianum	ROSACEAE
*	0	**Gilia**	**rubra (Ipomopsis r.)**	POLEMONIACEAE
*	0	**Glechoma**	**hederacea (Glecoma h.)**	LAMIACEAE
	1	Gleditsia	triacanthos	CAESALPINIACEAE
E	10	Glyceria	acutiflora	POACEAE
X	10	Glyceria	borealis	POACEAE

	7	Glyceria	canadensis	POACEAE
	8	Glyceria	grandis	POACEAE
	7	Glyceria	melicaria	POACEAE
	5	Glyceria	septentrionalis	POACEAE
	2	Glyceria	striata	POACEAE
*	0	**Glycine**	**max**	FABACEAE
X	10	Gnaphalium	macounii (G. viscosum)	ASTERACEAE
	2	Gnaphalium	obtusifolium	ASTERACEAE
	3	Gnaphalium	purpureum	ASTERACEAE
	3	Gnaphalium	uliginosum	ASTERACEAE
	6	Goodyera	pubescens	ORCHIDACEAE
X	10	Goodyera	tesselata	ORCHIDACEAE
	4	Gratiola	neglecta	SCROPHULARIACEAE
*	0	**Grindelia**	**squarrosa**	ASTERACEAE
T	9	Gymnocarpium	dryopteris	ASPLENIACEAE
**	0	Gymnocladus	dioica	CAESALPINIACEAE
*	0	**Gypsophila**	**scorzonerifolia**	CARYOPHYLLACEAE
E	10	Habenaria	blephariglottis (Platanthera b.)	ORCHIDACEAE
T	10	Habenaria	ciliaris (Platanthera c.)	ORCHIDACEAE
	8	Habenaria	clavellata (Platanthera c.)	ORCHIDACEAE
	6	Habenaria	flava (Platanthera f.)	ORCHIDACEAE
	10	Habenaria	hookeri (Platanthera h.)	ORCHIDACEAE
	10	Habenaria	hyperborea (Platanthera h.)	ORCHIDACEAE
	6	Habenaria	lacera (Platanthera l.)	ORCHIDACEAE
	10	Habenaria	leucophaea (Platanthera l.)	ORCHIDACEAE
	7	Habenaria	orbiculata (Platanthera o.)	ORCHIDACEAE
	7	Habenaria	peramoena (Platanthera p.)	ORCHIDACEAE
X	10	Habenaria	psycodes var. grandiflora (Platanthera p.)	ORCHIDACEAE
	9	Habenaria	psycodes var. psycodes (Platanthera p.)	ORCHIDACEAE
E	10	Habenaria	viridis (Coeloglossum v.)	ORCHIDACEAE
	2	Hackelia	virginiana	BORAGINACEAE
	5	Hamamelis	virginiana	HAMAMELIDACEAE
T	8	Hedeoma	hispidum	LAMIACEAE
	2	Hedeoma	pulegioides	LAMIACEAE

	4	Hedyotis	caerulea (Houstonia c.)	RUBIACEAE
	6	Hedyotis	canadensis (Houstonia c.)	RUBIACEAE
	7	Hedyotis	longifolia (Houstonia l.)	RUBIACEAE
	8	Hedyotis	nigricans (Houstonia n.)	RUBIACEAE
	7	Hedyotis	purpurea (Houstonia p.)	RUBIACEAE
	4	Helenium	autumnale	ASTERACEAE
*	0	**Helenium**	**flexuosum**	ASTERACEAE
T	9	Helianthemum	bicknellii	CISTACEAE
T	9	Helianthemum	canadense	CISTACEAE
*	0	**Helianthus**	**annuus**	ASTERACEAE
	4	Helianthus	decapetalus	ASTERACEAE
	5	Helianthus	divaricatus	ASTERACEAE
	6	Helianthus	giganteus	ASTERACEAE
	4	Helianthus	grosseserratus	ASTERACEAE
	5	Helianthus	hirsutus	ASTERACEAE
*	0	**Helianthus**	**maximilianii**	ASTERACEAE
	4	Helianthus	microcephalus	ASTERACEAE
T	8	Helianthus	mollis	ASTERACEAE
	7	Helianthus	occidentalis	ASTERACEAE
*	0	**Helianthus**	**petiolaris**	ASTERACEAE
	5	Helianthus	strumosus	ASTERACEAE
	3	Helianthus	tuberosus	ASTERACEAE
	4	Helianthus	x laetiflorus	ASTERACEAE
	5	Heliopsis	helianthoides	ASTERACEAE
*	0	**Heliotropium**	**europaeum**	BORAGINACEAE
*	0	**Hemerocallis**	**fulva**	LILIACEAE
*	0	**Hemerocallis**	**lilio-asphodelus**	LILIACEAE
T	8	Hemicarpha	micrantha	CYPERACEAE
	5	Hepatica	acutiloba	RANUNCULACEAE
	5	Hepatica	americana	RANUNCULACEAE
	4	Heracleum	lanatum	APIACEAE
*	0	**Hesperis**	**matronalis**	BRASSICACEAE
	6	Heteranthera	dubia	PONTEDERIACEAE
	6	Heuchera	americana	SAXIFRAGACEAE

	9	Hibiscus	laevis	MALVACEAE
	8	Hibiscus	moscheutos	MALVACEAE
*	0	**Hibiscus**	**trionum**	MALVACEAE
*	0	**Hieracium**	**aurantiacum**	ASTERACEAE
*	0	**Hieracium**	**caespitosum**	ASTERACEAE
*	0	**Hieracium**	**floribundum**	ASTERACEAE
	6	Hieracium	gronovii	ASTERACEAE
	10	Hieracium	kalmii (H. canadense)	ASTERACEAE
E	7	Hieracium	longipilum	ASTERACEAE
	6	Hieracium	paniculatum	ASTERACEAE
*	0	**Hieracium**	**pilosella**	ASTERACEAE
*	0	**Hieracium**	**piloselloides (H. florentinum)**	ASTERACEAE
	5	Hieracium	scabrum	ASTERACEAE
	8	Hieracium	trailii	ASTERACEAE
	7	Hieracium	venosum	ASTERACEAE
	8	Hierochloe	odorata	POACEAE
*	0	**Holcus**	**lanatus**	POACEAE
*	0	**Holosteum**	**umbellatum**	CARYOPHYLLACEAE
*	0	**Hordeum**	**jubatum**	POACEAE
*	0	**Hordeum**	**pusillum**	POACEAE
*	0	**Hordeum**	**vulgare**	POACEAE
*	0	**Hosta**	**lancifolia**	LILIACEAE
E	10	Hudsonia	tomentosa	CISTACEAE
*	0	**Humulus**	**japonicus**	CANNABACEAE
	2	Humulus	lupulus	CANNABACEAE
	7	Hybanthus	concolor	VIOLACEAE
**	10	Hydrangea	arborescens	HYDRANGEACEAE
	7	Hydrastis	canadensis	RANUNCULACEAE
	8	Hydrocotyle	americana	APIACEAE
*	0	**Hydrocotyle**	**ranunculoides**	APIACEAE
E	10	Hydrocotyle	umbellata	APIACEAE
	6	Hydrophyllum	appendiculatum	HYDROPHYLLACEAE
	6	Hydrophyllum	canadense	HYDROPHYLLACEAE
	7	Hydrophyllum	macrophyllum	HYDROPHYLLACEAE

	5	Hydrophyllum	virginianum	HYDROPHYLLACEAE
E	10	Hymenoxys	herbacea	ASTERACEAE
E	10	Hypericum	boreale	CLUSIACEAE
T	8	Hypericum	canadense	CLUSIACEAE
	6	Hypericum	drummondii	CLUSIACEAE
T	8	Hypericum	ellipticum	CLUSIACEAE
	4	Hypericum	gentianoides	CLUSIACEAE
E	10	Hypericum	gymnanthum	CLUSIACEAE
T	10	Hypericum	kalmianum	CLUSIACEAE
	7	Hypericum	majus	CLUSIACEAE
	5	Hypericum	mutilum	CLUSIACEAE
*	0	**Hypericum**	**perforatum**	CLUSIACEAE
	4	Hypericum	prolificum	CLUSIACEAE
	3	Hypericum	punctatum	CLUSIACEAE
	7	Hypericum	pyramidatum	CLUSIACEAE
	7	Hypericum	sphaerocarpum	CLUSIACEAE
*	0	**Hypochoeris**	**radicata**	ASTERACEAE
	7	Hypoxis	hirsuta	LILIACEAE
*	0	**Iberis**	**umbellata**	BRASSICACEAE
**	0	Ilex	opaca	AQUIFOLIACEAE
	7	Ilex	verticillata	AQUIFOLIACEAE
*	0	**Impatiens**	**balsamina**	BALSAMINACEAE
	2	Impatiens	capensis	BALSAMINACEAE
	3	Impatiens	pallida	BALSAMINACEAE
*	0	**Inula**	**helenium**	ASTERACEAE
	6	Iodanthus	pinnatifidus	BRASSICACEAE
*	0	**Ipomoea**	**coccinea**	CONVOLVULACEAE
*	0	**Ipomoea**	**hederacea**	CONVOLVULACEAE
	3	Ipomoea	pandurata	CONVOLVULACEAE
*	0	**Ipomoea**	**purpurea**	CONVOLVULACEAE
E	10	Iris	brevicaulis	IRIDACEAE
	8	Iris	cristata	IRIDACEAE
*	0	**Iris**	**germanica**	IRIDACEAE
*	0	**Iris**	**pseudacorus**	IRIDACEAE

	6	Iris	versicolor	IRIDACEAE
	6	Iris	virginica var. shrevei	IRIDACEAE
	4	Isanthus	brachiatus	LAMIACEAE
X	10	Isoetes	echinospora	ISOETACEAE
E	10	Isoetes	engelmannii	ISOETACEAE
	7	Isopyrum	biternatum	RANUNCULACEAE
	9	Isotria	verticillata	ORCHIDACEAE
*	0	**Iva**	**xanthifolia**	ASTERACEAE
	7	Jeffersonia	diphylla	BERBERIDACEAE
	10	Juglans	cinerea	JUGLANDACEAE
	5	Juglans	nigra	JUGLANDACEAE
	3	Juncus	acuminatus	JUNCACEAE
T	10	Juncus	alpinoarticulatus (J. alpinus)	JUNCACEAE
	9	Juncus	arcticus (J. balticus)	JUNCACEAE
	4	Juncus	articulatus	JUNCACEAE
	4	Juncus	biflorus	JUNCACEAE
	5	Juncus	brachycarpus	JUNCACEAE
	6	Juncus	brachycephalus	JUNCACEAE
	3	Juncus	bufonius	JUNCACEAE
	4	Juncus	canadensis	JUNCACEAE
	1	Juncus	effusus	JUNCACEAE
*	0	**Juncus**	**gerardii**	JUNCACEAE
E	7	Juncus	greenei	JUNCACEAE
	6	Juncus	marginatus	JUNCACEAE
	4	Juncus	nodosus	JUNCACEAE
T	7	Juncus	secundus	JUNCACEAE
T	7	Juncus	tenuis var. dichotomus (J. platyphyllus)	JUNCACEAE
	4	Juncus	tenuis var. dudleyi	JUNCACEAE
	1	Juncus	tenuis var. tenuis (incl. J. interior)	JUNCACEAE
	3	Juncus	torreyi	JUNCACEAE
T	8	Juniperus	communis	CUPRESSACEAE
	3	Juniperus	virginiana	CUPRESSACEAE
	8	Justicia	americana	ACANTHACEAE
*	0	**Kerria**	**japonica**	ROSACEAE

*	0	**Liatris**	**scariosa**	ASTERACEAE
	8	Liatris	spicata	ASTERACEAE
	8	Liatris	squarrosa	ASTERACEAE
*	0	**Ligustrum**	**obtusifolium**	OLEACEAE
*	0	**Ligustrum**	**ovalifolium**	OLEACEAE
*	0	**Ligustrum**	**vulgare**	OLEACEAE
	5	Lilium	canadense	LILIACEAE
	7	Lilium	michiganense	LILIACEAE
T	8	Lilium	philadelphicum	LILIACEAE
	7	Lilium	superbum	LILIACEAE
E	8	Linaria	canadensis	SCROPHULARIACEAE
*	0	**Linaria**	**dalmatica**	SCROPHULARIACEAE
*	0	**Linaria**	**vulgaris**	SCROPHULARIACEAE
	6	Lindera	benzoin	LAURACEAE
	4	Lindernia	dubia	SCROPHULARIACEAE
X	10	Linnaea	borealis	CAPRIFOLIACEAE
	6	Linum	medium var. texanum	LINACEAE
*	0	**Linum**	**perenne**	LINACEAE
	8	Linum	striatum	LINACEAE
	8	Linum	sulcatum	LINACEAE
*	0	**Linum**	**usitatissimum**	LINACEAE
	5	Linum	virginianum	LINACEAE
	5	Liparis	lilifolia	ORCHIDACEAE
	9	Liparis	loeselii	ORCHIDACEAE
	6	Liriodendron	tulipifera	MAGNOLIACEAE
X	10	Listera	cordata	ORCHIDACEAE
*	0	**Lithospermum**	**arvense**	BORAGINACEAE
	7	Lithospermum	canescens	BORAGINACEAE
T	9	Lithospermum	caroliniense	BORAGINACEAE
	7	Lithospermum	latifolium	BORAGINACEAE
*	0	**Lithospermum**	**officinale**	BORAGINACEAE
	7	Lobelia	cardinalis	CAMPANULACEAE
	1	Lobelia	inflata	CAMPANULACEAE
	9	Lobelia	kalmii	CAMPANULACEAE

	6	Lobelia	spicata	CAMPANULACEAE
	4	Lobelia	siphilitica	CAMPANULACEAE
*	0	**Lobularia**	**maritima**	BRASSICACEAE
*	0	**Lolium**	**perenne var. aristatum**	POACEAE
*	0	**Lolium**	**perenne var. perenne**	POACEAE
X	10	Lonicera	caerulea var. villosa	CAPRIFOLIACEAE
	8	Lonicera	canadensis	CAPRIFOLIACEAE
	5	Lonicera	dioica	CAPRIFOLIACEAE
*	0	**Lonicera**	**japonica**	CAPRIFOLIACEAE
*	0	**Lonicera**	**maackii**	CAPRIFOLIACEAE
*	0	**Lonicera**	**morrowii**	CAPRIFOLIACEAE
X	10	Lonicera	oblongifolia	CAPRIFOLIACEAE
	7	Lonicera	prolifera	CAPRIFOLIACEAE
	6	Lonicera	sempervirens	CAPRIFOLIACEAE
*	0	**Lonicera**	**tatarica**	CAPRIFOLIACEAE
*	0	**Lonicera**	**xylosteum**	CAPRIFOLIACEAE
*	0	**Lonicera**	**x bella**	CAPRIFOLIACEAE
*	0	**Lotus**	**corniculatus**	FABACEAE
	5	Ludwigia	alternifolia	ONAGRACEAE
	4	Ludwigia	palustris	ONAGRACEAE
	7	Ludwigia	polycarpa	ONAGRACEAE
*	0	**Lunaria**	**annua**	BRASSICACEAE
*	0	**Lunaria**	**rediviva**	BRASSICACEAE
	10	Lupinus	perennis	FABACEAE
T	8	Luzula	bulbosa	JUNCACEAE
	7	Luzula	carolinae	JUNCACEAE
	4	Luzula	echinata	JUNCACEAE
	5	Luzula	multiflora	JUNCACEAE
*	0	**Lychnis**	**coronaria**	CARYOPHYLLACEAE
*	0	**Lychnis**	**flos-cuculi**	CARYOPHYLLACEAE
*	0	**Lychnis**	**viscaria**	CARYOPHYLLACEAE
*	0	**Lycium**	**barbarum (L. halimifolium)**	SOLANACEAE
*	0	**Lycopersicon**	**esculentum**	SOLANACEAE
	3	Lycopodium	clavatum	LYCOPODIACEAE

	5	Lycopodium	dendroideum	LYCOPODIACEAE
	3	Lycopodium	digitatum (L. flabelliforme)	LYCOPODIACEAE
	9	Lycopodium	inundatum	LYCOPODIACEAE
	8	Lycopodium	lucidulum	LYCOPODIACEAE
	5	Lycopodium	obscurum	LYCOPODIACEAE
	9	Lycopodium	porophilum	LYCOPODIACEAE
	6	Lycopodium	tristachyum	LYCOPODIACEAE
	3	Lycopodium	x habereri	LYCOPODIACEAE
	3	Lycopus	americanus	LAMIACEAE
*	0	**Lycopus**	**asper**	LAMIACEAE
*	0	**Lycopus**	**europaeus**	LAMIACEAE
	6	Lycopus	rubellus	LAMIACEAE
	3	Lycopus	uniflorus	LAMIACEAE
	4	Lycopus	virginicus	LAMIACEAE
*	0	**Lycoris**	**squamigera**	LILIACEAE
	4	Lysimachia	ciliata	PRIMULACEAE
	8	Lysimachia	lanceolata	PRIMULACEAE
*	0	**Lysimachia**	**nummularia**	PRIMULACEAE
*	0	**Lysimachia**	**punctata**	PRIMULACEAE
	8	Lysimachia	quadriflora	PRIMULACEAE
	5	Lysimachia	quadrifolia	PRIMULACEAE
	6	Lysimachia	terrestris	PRIMULACEAE
	6	Lysimachia	thyrsiflora	PRIMULACEAE
*	0	**Lysimachia**	**vulgaris**	PRIMULACEAE
	3	Lysimachia	x producta	PRIMULACEAE
	7	Lythrum	alatum	LYTHRACEAE
*	0	**Lythrum**	**hyssopifolia**	LYTHRACEAE
*	0	**Lythrum**	**salicaria**	LYTHRACEAE
*	0	**Maclura**	**pomifera**	MORACEAE
	7	Magnolia	acuminata	MAGNOLIACEAE
	7	Maianthemum	canadense	LILIACEAE
	8	Malaxis	unifolia	ORCHIDACEAE
*	0	**Malva**	**moschata**	MALVACEAE
*	0	**Malva**	**neglecta**	MALVACEAE

*	0	**Malva**	**rotundifolia**	MALVACEAE
*	0	**Malva**	**sylvestris**	MALVACEAE
*	0	**Marrubium**	**vulgare**	LAMIACEAE
*	0	**Matricaria**	**maritima**	ASTERACEAE
*	0	**Matricaria**	**matricarioides**	ASTERACEAE
*	0	**Matricaria**	**recutita**	ASTERACEAE
	5	Matteuccia	struthiopteris	ONOCLEACEAE
	7	Medeola	virginiana	LILIACEAE
*	0	**Medicago**	**lupulina**	FABACEAE
*	0	**Medicago**	**sativa**	FABACEAE
	9	Melampyrum	lineare	SCROPHULARIACEAE
T	10	Melanthium	virginicum	LILIACEAE
*	0	**Melilotus**	**alba**	FABACEAE
*	0	**Melilotus**	**altissima**	FABACEAE
*	0	**Melilotus**	**officinalis**	FABACEAE
*	0	**Melissa**	**officinalis**	LAMIACEAE
	5	Menispermum	canadense	MENISPERMACEAE
	2	Mentha	arvensis	LAMIACEAE
*	0	**Mentha**	**longifolia**	LAMIACEAE
*	0	**Mentha**	**spicata**	LAMIACEAE
*	0	**Mentha**	**x citrata**	LAMIACEAE
*	0	**Mentha**	**x gentilis**	LAMIACEAE
*	0	**Mentha**	**x piperita**	LAMIACEAE
*	0	**Mentha**	**x rotundifolia**	LAMIACEAE
*	0	**Mentha**	**x villosa**	LAMIACEAE
T	9	Menyanthes	trifoliata	MENYANTHACEAE
	8	Mertensia	virginica	BORAGINACEAE
	8	Milium	effusum	POACEAE
	6	Mimulus	alatus	SCROPHULARIACEAE
	5	Mimulus	ringens	SCROPHULARIACEAE
*	0	**Mirabilis**	**jalapa**	NYCTAGINACEAE
*	0	**Mirabilis**	**nyctaginea**	NYCTAGINACEAE
*	0	**Miscanthus**	**sinensis**	POACEAE
	5	Mitchella	repens	RUBIACEAE

	7	Mitella	diphylla	SAXIFRAGACEAE
*	0	**Mollugo**	**verticillata**	AIZOACEAE
	5	Monarda	clinopodia	LAMIACEAE
	7	Monarda	didyma	LAMIACEAE
	5	Monarda	fistulosa	LAMIACEAE
E	7	Monarda	punctata	LAMIACEAE
	5	Monarda	x media	LAMIACEAE
E	8	Moneses	uniflora	PYROLACEAE
	7	Monotropa	hypopithys	MONOTROPACEAE
	5	Monotropa	uniflora	MONOTROPACEAE
*	0	**Morus**	**alba**	MORACEAE
*	0	**Morus**	**nigra**	MORACEAE
	6	Morus	rubra	MORACEAE
*	0	**Muhlenbergia**	**asperifolia**	POACEAE
	3	Muhlenbergii	frondosa	POACEAE
	9	Muhlenbergia	glomerata	POACEAE
	5	Muhlenbergia	mexicana	POACEAE
	1	Muhlenbergia	schreberi	POACEAE
	8	Muhlenbergia	sobolifera	POACEAE
	6	Muhlenbergia	sylvatica	POACEAE
	8	Muhlenbergia	tenuiflora	POACEAE
*	0	**Muscari**	**botryoides**	LILIACEAE
*	0	**Myosotis**	**arvensis**	BORAGINACEAE
*	0	**Myosotis**	**discolor**	BORAGINACEAE
	7	Myosotis	laxa	BORAGINACEAE
*	0	**Myosotis**	**micrantha (M. stricta)**	BORAGINACEAE
*	0	**Myosotis**	**scorpioides**	BORAGINACEAE
*	0	**Myosotis**	**sylvatica**	BORAGINACEAE
	7	Myosotis	verna	BORAGINACEAE
E	10	Myrica	pensylvanica	MYRICACEAE
E	10	Myriophyllum	heterophyllum	HALORAGACEAE
	8	Myriophyllum	sibiricum (M. exalbescens)	HALORAGACEAE
*	0	**Myriophyllum**	**spicatum**	HALORAGACEAE
E	10	Myriophyllum	verticillatum	HALORAGACEAE

	8	Najas	flexilis	NAJADACEAE
E	10	Najas	gracillima	NAJADACEAE
	7	Najas	guadalupensis	NAJADACEAE
*	0	**Najas**	**minor**	NAJADACEAE
**	0	Napaea	dioica	MALVACEAE
*	0	**Narcissus**	**pseudonarcissus**	LILIACEAE
	9	Nelumbo	lutea	NELUMBONACEAE
	10	Nemopanthus	mucronatus	AQUIFOLIACEAE
*	0	**Nepeta**	**cataria**	LAMIACEAE
*	0	**Nicandra**	**physalodes**	SOLANACEAE
*	0	**Nicotiana**	**tabacum**	SOLANACEAE
	5	Nuphar	advena	NYMPHAEACEAE
E	10	Nuphar	variegata	NYMPHAEACEAE
	7	Nymphaea	odorata	NYMPHAEACEAE
*	0	**Nymphoides**	**peltata**	MENYANTHACEAE
	7	Nyssa	sylvatica	CORNACEAE
	8	Obolaria	virginica	GENTIANACEAE
	2	Oenothera	biennis	ONAGRACEAE
	5	Oenothera	fruticosa var. ambigua	ONAGRACEAE
	3	Oenothera	laciniata	ONAGRACEAE
	4	Oenothera	perennis	ONAGRACEAE
	4	Oenothera	pilosella	ONAGRACEAE
*	0	**Oenothera**	**speciosa**	ONAGRACEAE
	3	Onoclea	sensibilis	ASPLENIACEAE
	8	Onosmodium	molle var. hispidissimum	BORAGINACEAE
	6	Ophioglossum	vulgatum	OPHIOGLOSSACEAE
	9	Opuntia	humifusa	CACTACEAE
	9	Orbexilum	pedunculatum (Psoralea onobrychis)	FABACEAE
	7	Orchis	spectabilis	ORCHIDACEAE
*	0	**Origanum**	**vulgare**	LAMIACEAE
*	0	**Ornithogalum**	**umbellatum**	LILIACEAE
	7	Orobanche	uniflora	OROBANCHACEAE
E	10	Oryzopsis	asperifolia	POACEAE
E	10	Oryzopsis	racemosa	POACEAE

	5	Osmorhiza	claytonii	APIACEAE
	5	Osmorhiza	longistylis	APIACEAE
	6	Osmunda	cinnamomea	OSMUNDACEAE
	6	Osmunda	claytoniana	OSMUNDACEAE
	8	Osmunda	regalis	OSMUNDACEAE
	5	Ostrya	virginiana	BETULACEAE
E	10	Oxalis	acetosella (O. montana)	OXALIDACEAE
*	0	**Oxalis**	**corniculata**	OXALIDACEAE
	0	Oxalis	dillenii	OXALIDACEAE
	7	Oxalis	grandis	OXALIDACEAE
	0	Oxalis	stricta	OXALIDACEAE
	6	Oxalis	violacea	OXALIDACEAE
	8	Oxypolis	rigidior	APIACEAE
	8	Panax	quinquefolium	ARALIACEAE
	7	Panax	trifolium	ARALIACEAE
T	8	Panicum	boreale (incl. P. bicknellii)	POACEAE
	5	Panicum	boscii	POACEAE
X	10	Panicum	calliphyllum	POACEAE
	1	Panicum	capillare (incl. P. gattingeri)	POACEAE
	3	Panicum	clandestinum	POACEAE
	9	Panicum	columbianum	POACEAE
	5	Panicum	commutatum	POACEAE
	9	Panicum	depauperatum	POACEAE
	1	Panicum	dichotomiflorum	POACEAE
	3	Panicum	dichotomum	POACEAE
	2	Panicum	lanuginosum	POACEAE
	3	Panicum	latifolium	POACEAE
	4	Panicum	linearifolium	POACEAE
	5	Panicum	microcarpon	POACEAE
*	0	**Panicum**	**miliaceum**	POACEAE
	7	Panicum	oligosanthes	POACEAE
T	8	Panicum	philadelphicum	POACEAE
	4	Panicum	rigidulum (incl. P. agrostoides and P. stipitatum)	POACEAE
	4	Panicum	sphaerocarpon	POACEAE

E	10	Panicum	spretum	POACEAE
T	9	Panicum	villosissimum	POACEAE
	4	Panicum	virgatum	POACEAE
*	0	**Papaver**	**argemone**	PAPAVERACEAE
*	0	**Papaver**	**dubium**	PAPAVERACEAE
*	0	**Papaver**	**rhoeas**	PAPAVERACEAE
*	0	**Papaver**	**somniferum**	PAPAVERACEAE
	6	Parietaria	pensylvanica	URTICACEAE
	10	Parnassia	glauca	SAXIFRAGACEAE
	4	Paronychia	canadensis	CARYOPHYLLACEAE
	7	Paronychia	fastigiata	CARYOPHYLLACEAE
	3	Parthenocissus	quinquefolia	VITACEAE
	1	Parthenocissus	vitacea (P. inserta)	VITACEAE
	3	Paspalum	setaceum var. ciliatifolium	POACEAE
*	0	**Pastinaca**	**sativa**	APIACEAE
	6	Pedicularis	canadensis	SCROPHULARIACEAE
	8	Pedicularis	lanceolata	SCROPHULARIACEAE
	6	Peltandra	virginica	ARACEAE
	3	Penstemon	digitalis	SCROPHULARIACEAE
	6	Penstemon	hirsutus	SCROPHULARIACEAE
E	8	Penstemon	laevigatus (incl. P. calycosus)	SCROPHULARIACEAE
T	7	Penstemon	pallidus	SCROPHULARIACEAE
	3	Penthorum	sedoides	SAXIFRAGACEAE
x	10	Perideridia	americana	APIACEAE
*	0	**Perilla**	**frutescens**	LAMIACEAE
*	0	**Petasites**	**hybridus**	ASTERACEAE
*	0	**Petunia**	**x hybrida**	SOLANACEAE
x	10	Phacelia	dubia	HYDROPHYLLACEAE
	5	Phacelia	purshii	HYDROPHYLLACEAE
	0	Phalaris	arundinacea	POACEAE
*	0	**Phalaris**	**canariensis**	POACEAE
	8	Phaseolus	polystachios	FABACEAE
*	0	**Phaseolus**	**vulgaris**	FABACEAE
*	0	**Philadelphus**	**coronarius**	HYDRANGEACEAE

*	0	**Philadelphus**	**pubescens**	HYDRANGEACEAE
*	0	**Phleum**	**pratense**	POACEAE
	6	Phlox	divaricata	POLEMONIACEAE
	7	Phlox	maculata	POLEMONIACEAE
T	8	Phlox	ovata	POLEMONIACEAE
	4	Phlox	paniculata	POLEMONIACEAE
	7	Phlox	pilosa	POLEMONIACEAE
	6	Phlox	subulata	POLEMONIACEAE
	0	Phragmites	australis (P. communis)	POACEAE
	5	Phryma	leptostachya	VERBENACEAE
	6	Phyla	lanceolata (Lippia l.)	VERBENACEAE
*	0	**Physalis**	**alkekengii**	SOLANACEAE
	2	Physalis	heterophylla	SOLANACEAE
	2	Physalis	longifolia	SOLANACEAE
*	0	**Physalis**	**pubescens**	SOLANACEAE
*	0	**Physalis**	**pumila**	SOLANACEAE
	4	Physocarpus	opulifolius	ROSACEAE
**	6	Physostegia	virginiana	LAMIACEAE
	2	Phytolacca	americana	PHYTOLACCACEAE
*	0	**Picris**	**echioides**	ASTERACEAE
*	0	**Picris**	**hieracioides**	ASTERACEAE
	4	Pilea	fontana	URTICACEAE
	4	Pilea	pumila	URTICACEAE
*	0	**Pinus**	**nigra**	PINACEAE
**	6	Pinus	strobus	PINACEAE
*	0	**Pinus**	**sylvestris**	PINACEAE
*	0	**Plantago**	**aristata**	PLANTAGINACEAE
E	10	Plantago	cordata	PLANTAGINACEAE
*	0	**Plantago**	**lanceolata**	PLANTAGINACEAE
*	0	**Plantago**	**major**	PLANTAGINACEAE
*	0	**Plantago**	**patagonica (P. purshii)**	PLANTAGINACEAE
*	0	**Plantago**	**psyllium**	PLANTAGINACEAE
	0	Plantago	rugelii	PLANTAGINACEAE
	0	Plantago	virginica	PLANTAGINACEAE

	7	Platanus	occidentalis	PLATANACEAE
	4	Poa	alsodes	POACEAE
*	0	**Poa**	**annua**	POACEAE
*	0	**Poa**	**bulbosa**	POACEAE
*	0	**Poa**	**compressa**	POACEAE
	7	Poa	cuspidata	POACEAE
	8	Poa	languida	POACEAE
*	0	**Poa**	**nemoralis**	POACEAE
	5	Poa	palustris	POACEAE
*	0	**Poa**	**pratensis**	POACEAE
E	8	Poa	saltuensis	POACEAE
	6	Poa	sylvestris	POACEAE
	5	Poa	trivialis	POACEAE
	5	Podophyllum	peltatum	BERBERIDACEAE
E	10	Podostemum	ceratophyllum	PODOSTEMACEAE
T	10	Pogonia	ophioglossoides	ORCHIDACEAE
	3	Polanisia	dodecandra	CAPPARACEAE
*	0	**Polanisia**	**jamesii (Cristatella j.)**	CAPPARACEAE
*	0	**Polemonium**	**caeruleum**	POLEMONIACEAE
	6	Polemonium	reptans	POLEMONIACEAE
E	8	Polygala	cruciata	POLYGALACEAE
E	8	Polygala	paucifolia	POLYGALACEAE
T	10	Polygala	polygama	POLYGALACEAE
	4	Polygala	sanguinea	POLYGALACEAE
	7	Polygala	senega	POLYGALACEAE
	4	Polygala	verticillata	POLYGALACEAE
	5	Polygonatum	biflorum (incl. P. commutatum)	LILIACEAE
	5	Polygonatum	pubescens	LILIACEAE
*	0	**Polygonum**	**achoreum**	POLYGONACEAE
	5	Polygonum	amphibium	POLYGONACEAE
*	0	**Polygonum**	**arenastrum**	POLYGONACEAE
	4	Polygonum	arifolium	POLYGONACEAE
*	0	**Polygonum**	**aviculare**	POLYGONACEAE
*	0	**Polygonum**	**caespitosum**	POLYGONACEAE

X	10	Polygonum	careyi	POLYGONACEAE
E	9	Polygonum	cilinode	POLYGONACEAE
*	0	**Polygonum**	**convolvulus**	POLYGONACEAE
*	0	**Polygonum**	**cuspidatum**	POLYGONACEAE
	1	Polygonum	erectum	POLYGONACEAE
	3	Polygonum	hydropiper	POLYGONACEAE
	5	Polygonum	hydropiperoides	POLYGONACEAE
	1	Polygonum	lapathifolium	POLYGONACEAE
*	0	**Polygonum**	**orientale**	POLYGONACEAE
	1	Polygonum	pensylvanicum	POLYGONACEAE
*	0	**Polygonum**	**persicaria**	POLYGONACEAE
	6	Polygonum	punctatum	POLYGONACEAE
*	0	**Polygonum**	**robustius**	POLYGONACEAE
	3	Polygonum	sagittatum	POLYGONACEAE
	2	Polygonum	scandens var. cristatum	POLYGONACEAE
	2	Polygonum	scandens var. scandens	POLYGONACEAE
	5	Polygonum	tenue	POLYGONACEAE
	4	Polygonum	virginianum	POLYGONACEAE
	5	Polymnia	canadensis	ASTERACEAE
	8	Polymnia	uvedalia	ASTERACEAE
	7	Polypodium	virginianum	POLYPODIACEAE
	4	Polystichum	acrostichoides	ASPLENIACEAE
	7	Pontederia	cordata	PONTEDERIACEAE
*	0	**Populus**	**alba**	SALICACEAE
T	7	Populus	balsamifera	SALICACEAE
	5	Populus	deltoides	SALICACEAE
	2	Populus	grandidentata	SALICACEAE
	8	Populus	heterophylla	SALICACEAE
*	0	**Populus**	**nigra**	SALICACEAE
	2	Populus	tremuloides	SALICACEAE
*	0	**Populus**	**x canescens**	SALICACEAE
*	0	**Populus**	**x jackii**	SALICACEAE
	8	Porteranthus	stipulatus	ROSACEAE
	8	Porteranthus	trifoliatus	ROSACEAE

*	0	**Portulaca**	**oleracea**	PORTULACACEAE
	8	Potamogeton	amplifolius	POTAMOGETONACEAE
*	0	**Potamogeton**	**crispus**	POTAMOGETONACEAE
	6	Potamogeton	diversifolius	POTAMOGETONACEAE
	6	Potamogeton	epihydrus	POTAMOGETONACEAE
	4	Potamogeton	foliosus	POTAMOGETONACEAE
E	10	Potamogeton	friesii	POTAMOGETONACEAE
E	10	Potamogeton	gramineus	POTAMOGETONACEAE
E	10	Potamogeton	hillii	POTAMOGETONACEAE
	10	Potamogeton	illinoensis	POTAMOGETONACEAE
	10	Potamogeton	natans	POTAMOGETONACEAE
	3	Potamogeton	nodosus	POTAMOGETONACEAE
	3	Potamogeton	pectinatus	POTAMOGETONACEAE
E	10	Potamogeton	praelongus	POTAMOGETONACEAE
T	10	Potamogeton	pulcher	POTAMOGETONACEAE
	3	Potamogeton	pusillus (incl. P. berchtoldii)	POTAMOGETONACEAE
	10	Potamogeton	richardsonii	POTAMOGETONACEAE
E	10	Potamogeton	robbinsii	POTAMOGETONACEAE
T	10	Potamogeton	spirillus	POTAMOGETONACEAE
X	10	Potamogeton	strictifolius	POTAMOGETONACEAE
X	10	Potamogeton	vaseyi	POTAMOGETONACEAE
	8	Potamogeton	zosteriformis	POTAMOGETONACEAE
	10	Potentilla	anserina	ROSACEAE
*	0	**Potentilla**	**argentea**	ROSACEAE
E	8	Potentilla	arguta	ROSACEAE
	3	Potentilla	canadensis	ROSACEAE
	10	Potentilla	fruticosa	ROSACEAE
*	0	**Potentilla**	**inclinata**	ROSACEAE
*	0	**Potentilla**	**intermedia**	ROSACEAE
	1	Potentilla	norvegica	ROSACEAE
T	10	Potentilla	palustris	ROSACEAE
T	10	Potentilla	paradoxa	ROSACEAE
*	0	**Potentilla**	**recta**	ROSACEAE
*	0	**Potentilla**	**reptans**	ROSACEAE

	1	Potentilla	simplex	ROSACEAE
	5	Prenanthes	alba	ASTERACEAE
	5	Prenanthes	altissima	ASTERACEAE
E	10	Prenanthes	aspera	ASTERACEAE
T	10	Prenanthes	crepidinea	ASTERACEAE
	8	Prenanthes	racemosa	ASTERACEAE
*	0	**Proboscidea**	**louisiana**	PEDALIACEAE
	6	Proserpinaca	palustris	HALORAGACEAE
**	0	Prunella	vulgaris	LAMIACEAE
	5	Prunus	americana	ROSACEAE
*	0	**Prunus**	**avium**	ROSACEAE
*	0	**Prunus**	**cerasus**	ROSACEAE
*	0	**Prunus**	**mahaleb**	ROSACEAE
E	8	Prunus	nigra	ROSACEAE
	4	Prunus	pensylvanica	ROSACEAE
*	0	**Prunus**	**persica**	ROSACEAE
X	10	Prunus	pumila var. pumila	ROSACEAE
T	10	Prunus	pumila var. susquehanae	ROSACEAE
	3	Prunus	serotina	ROSACEAE
*	0	**Prunus**	**tomentosa**	ROSACEAE
	2	Prunus	virginiana	ROSACEAE
	8	Psoralea	psoralioides	FABACEAE
	6	Ptelea	trifoliata	RUTACEAE
	3	Pteridium	aquilinum	DENNSTAEDTIACEAE
*	0	**Puccinellia**	**distans**	POACEAE
	7	Puccinellia	pallida	POACEAE
	7	Pycnanthemum	incanum	LAMIACEAE
	8	Pycnanthemum	muticum	LAMIACEAE
	3	Pycnanthemum	tenuifolium	LAMIACEAE
E	9	Pycnanthemum	verticillatum var. pilosum	LAMIACEAE
	3	Pycnanthemum	virginianum	LAMIACEAE
E	10	Pyrola	chlorantha	PYROLACEAE
	6	Pyrola	elliptica	PYROLACEAE
	7	Pyrola	rotundifolia	PYROLACEAE

X	10	Pyrola	secunda	PYROLACEAE
X	10	Pyrus	angustifolia (Malus a.)	ROSACEAE
*	0	**Pyrus**	**communis**	ROSACEAE
	3	Pyrus	coronaria (Malus c.)	ROSACEAE
*	0	**Pyrus**	**ioensis**	ROSACEAE
*	0	**Pyrus**	**malus (Malus pumila)**	ROSACEAE
	7	Quercus	alba	FAGACEAE
	7	Quercus	bicolor	FAGACEAE
	6	Quercus	coccinea	FAGACEAE
	5	Quercus	imbricaria	FAGACEAE
	6	Quercus	macrocarpa	FAGACEAE
	5	Quercus	muehlenbergii	FAGACEAE
	4	Quercus	palustris	FAGACEAE
	6	Quercus	prinus	FAGACEAE
	7	Quercus	rubra	FAGACEAE
	7	Quercus	velutina	FAGACEAE
	5	Quercus	x leana	FAGACEAE
	4	Ranunculus	aboritivus	RANUNCULACEAE
*	0	**Ranunculus**	**acris**	RANUNCULACEAE
	5	Ranunculus	allegheniensis	RANUNCULACEAE
	8	Ranunculus	ambigens	RANUNCULACEAE
*	0	**Ranunculus**	**bulbosus**	RANUNCULACEAE
	8	Ranunculus	fascicularis	RANUNCULACEAE
*	0	**Ranunculus**	**ficaria**	RANUNCULACEAE
	6	Ranunculus	flabellaris	RANUNCULACEAE
	5	Ranunculus	hispidus var. hispidus	RANUNCULACEAE
	6	Ranunculus	hispidus var. nitidus (R. septentrionalis)	RANUNCULACEAE
	7	Ranunculus	longirostris	RANUNCULACEAE
	6	Ranunculus	micranthus	RANUNCULACEAE
	3	Ranunculus	pensylvanicus	RANUNCULACEAE
	3	Ranunculus	recurvatus	RANUNCULACEAE
*	0	**Ranunculus**	**repens**	RANUNCULACEAE
	2	Ranunculus	sceleratus	RANUNCULACEAE
*	0	**Ranunculus**	**testiculatus**	RANUNCULACEAE

*	0	**Raphanus**	**raphanistrum**	BRASSICACEAE
*	0	**Raphanus**	**sativus**	BRASSICACEAE
	7	Ratibida	pinnata	ASTERACEAE
*	0	**Reseda**	**luteola**	RESEDACEAE
	8	Rhamnus	alnifolia	RHAMNACEAE
*	0	**Rhamnus**	**cathartica**	RHAMNACEAE
*	0	**Rhamnus**	**frangula**	RHAMNACEAE
	6	Rhamnus	lanceolata	RHAMNACEAE
	8	Rhexia	virginica	MELASTOMATACEAE
	8	Rhododendron	prinophyllum (R. nudiflorum var. roseum)	ERICACEAE
X	10	Rhus	aromatica var. arenaria	ANACARDIACEAE
	4	Rhus	aromatica var. aromatica	ANACARDIACEAE
	6	Rhus	copallina	ANACARDIACEAE
	2	Rhus	glabra	ANACARDIACEAE
	2	Rhus	typhina	ANACARDIACEAE
	10	Rhynchospora	alba	CYPERACEAE
	9	Rhynchospora	capillacea	CYPERACEAE
	9	Rhynchospora	capitellata	CYPERACEAE
	6	Ribes	americanum	GROSSULARIACEAE
	5	Ribes	cynosbati	GROSSULARIACEAE
X	10	Ribes	glandulosum	GROSSULARIACEAE
*	0	**Ribes**	**grossularia**	GROSSULARIACEAE
	10	Ribes	hirtellum	GROSSULARIACEAE
*	0	**Ribes**	**odoratum**	GROSSULARIACEAE
*	0	**Ribes**	**sativum**	GROSSULARIACEAE
E	8	Ribes	triste	GROSSULARIACEAE
*	0	**Ricinus**	**communis**	EUPHORBIACEAE
*	0	**Robinia**	**hispida**	FABACEAE
**	0	Robinia	pseudoacacia	FABACEAE
*	0	**Robinia**	**viscosa**	FABACEAE
*	0	**Rorippa**	**nasturtium-aquaticum (Nasturtium officinale)**	BRASSICACEAE
	1	Rorippa	palustris	BRASSICACEAE
*	0	**Rorippa**	**sylvestris**	BRASSICACEAE
	8	Rosa	blanda	ROSACEAE

*	0	**Rosa**	**canina**	ROSACEAE
	5	Rosa	carolina	ROSACEAE
*	0	**Rosa**	**eglanteria**	ROSACEAE
*	0	**Rosa**	**majalis** (R. cinnamomea)	ROSACEAE
*	0	**Rosa**	**micrantha**	ROSACEAE
*	0	**Rosa**	**multiflora**	ROSACEAE
	4	Rosa	palustris	ROSACEAE
*	0	**Rosa**	**rugosa**	ROSACEAE
	6	Rosa	setigera	ROSACEAE
*	0	**Rosa**	**wichuriana**	ROSACEAE
	5	Rotala	ramosior	LYTHRACEAE
	1	Rubus	allegheniensis	ROSACEAE
	2	Rubus	flagellaris	ROSACEAE
	5	Rubus	hispidus	ROSACEAE
	6	Rubus	idaeus (R. strigosus)	ROSACEAE
*	0	**Rubus**	**laciniatus**	ROSACEAE
	1	Rubus	occidentalis	ROSACEAE
	5	Rubus	odoratus	ROSACEAE
	2	Rubus	pensylvanicus	ROSACEAE
	6	Rubus	pubescens	ROSACEAE
X	10	Rubus	setosus	ROSACEAE
	7	Rudbeckia	fulgida	ASTERACEAE
	3	Rudbeckia	hirta	ASTERACEAE
	5	Rudbeckia	laciniata	ASTERACEAE
	6	Rudbeckia	triloba	ASTERACEAE
	3	Ruellia	strepens	ACANTHACEAE
*	0	**Rumex**	**acetosella**	POLYGONACEAE
	2	Rumex	altissimus	POLYGONACEAE
*	0	**Rumex**	**conglomeratus**	POLYGONACEAE
*	0	**Rumex**	**crispus**	POLYGONACEAE
*	0	**Rumex**	**maritimus**	POLYGONACEAE
*	0	**Rumex**	**obtusifolius**	POLYGONACEAE
	3	Rumex	orbiculatus	POLYGONACEAE
	5	Rumex	verticillatus	POLYGONACEAE

*	0	**Ruppia**	**maritima**	RUPPIACEAE
	5	Sabatia	angularis	GENTIANACEAE
**	0	Sagina	decumbens	CARYOPHYLLACEAE
*	0	**Sagina**	**procumbens**	CARYOPHYLLACEAE
	7	Sagittaria	brevirostra	ALISMATACEAE
T	7	Sagittaria	calycina (Lophotocarpus c.)	ALISMATACEAE
E	8	Sagittaria	cuneata	ALISMATACEAE
E	8	Sagittaria	graminea	ALISMATACEAE
	2	Sagittaria	latifolia	ALISMATACEAE
T	7	Sagittaria	rigida	ALISMATACEAE
*	0	**Salicornia**	**europaea**	CHENOPODIACEAE
*	0	**Salix**	**alba**	SALICACEAE
	4	Salix	amygdaloides	SALICACEAE
*	0	**Salix**	**babylonica**	SALICACEAE
	8	Salix	bebbiana	SALICACEAE
T	10	Salix	candida	SALICACEAE
	3	Salix	discolor	SALICACEAE
	1	Salix	eriocephala	SALICACEAE
	1	Salix	exigua	SALICACEAE
*	0	**Salix**	**fragilis**	SALICACEAE
	4	Salix	humilis	SALICACEAE
	4	Salix	lucida	SALICACEAE
	9	Salix	myricoides	SALICACEAE
	3	Salix	nigra	SALICACEAE
	4	Salix	occidentalis (S. tristis)	SALICACEAE
E	10	Salix	pedicellaris	SALICACEAE
T	8	Salix	petiolaris	SALICACEAE
*	0	**Salix**	**purpurea**	SALICACEAE
	4	Salix	sericea	SALICACEAE
	10	Salix	serissima	SALICACEAE
	4	Salix	x subsericea	SALICACEAE
*	0	**Salsola**	**kali**	CHENOPODIACEAE
*	0	**Salvia**	**azurea**	LAMIACEAE
*	0	**Salvia**	**lyrata**	LAMIACEAE

*	0	**Salvia**	**officinalis**	LAMIACEAE
*	0	**Salvia**	**pratensis**	LAMIACEAE
*	0	**Salvia**	**reflexa**	LAMIACEAE
*	0	**Salvia**	**x superba**	LAMIACEAE
	3	Sambucus	canadensis	CAPRIFOLIACEAE
	6	Sambucus	racemosa (S. pubens)	CAPRIFOLIACEAE
	5	Samolus	floribundus (S. parviflorus)	PRIMULACEAE
	5	Sanguinaria	canadensis	PAPAVERACEAE
	8	Sanguisorba	canadensis	ROSACEAE
	4	Sanicula	canadensis	APIACEAE
	4	Sanicula	gregaria	APIACEAE
	5	Sanicula	marilandica	APIACEAE
	5	Sanicula	trifoliata	APIACEAE
*	0	**Saponaria**	**officinalis**	CARYOPHYLLACEAE
T	10	Sarracenia	purpurea	SARRACENIACEAE
	4	Sassafras	albidum	LAURACEAE
	8	Satureja	glabella var. angustifolia (S. arkansana)	LAMIACEAE
*	0	**Satureja**	**hortensis**	LAMIACEAE
	3	Satureja	vulgaris (Clinopodium v.)	LAMIACEAE
	7	Saururus	cernuus	SAURURACEAE
	6	Saxifraga	pensylvanica	SAXIFRAGACEAE
	8	Saxifraga	virginiensis	SAXIFRAGACEAE
E	10	Scheuchzeria	palustris	SCHEUCHZERIACEAE
E	10	Schizachne	purpurascens	POACEAE
	6	Schizachyrium	scoparium (Andropogon s.)	POACEAE
*	0	**Scilla**	**non-scripta**	LILIACEAE
	5	Scirpus	acutus	CYPERACEAE
	5	Scirpus	americanus	CYPERACEAE
	2	Scirpus	atrovirens	CYPERACEAE
	1	Scirpus	cyperinus	CYPERACEAE
T	9	Scirpus	expansus	CYPERACEAE
	5	Scirpus	fluviatilis	CYPERACEAE
	6	Scirpus	pendulus	CYPERACEAE
	4	Scirpus	polyphyllus	CYPERACEAE

E	8	Scirpus	smithii (S. purshianus)	CYPERACEAE
X	10	Scirpus	torreyi	CYPERACEAE
	6	Scirpus	validus	CYPERACEAE
	7	Scirpus	verecundus	CYPERACEAE
*	0	**Scleranthus**	**annuus**	CARYOPHYLLACEAE
T	10	Scleria	pauciflora	CYPERACEAE
	8	Scleria	triglomerata	CYPERACEAE
	10	Scleria	verticillata	CYPERACEAE
	5	Scrophularia	lanceolata	SCROPHULARIACEAE
	5	Scrophularia	marilandica	SCROPHULARIACEAE
	6	Scutellaria	galericulata (S. epilobiifolia)	LAMIACEAE
	6	Scutellaria	incana	LAMIACEAE
	3	Scutellaria	lateriflora	LAMIACEAE
	6	Scutellaria	nervosa var. calvifolia	LAMIACEAE
	7	Scutellaria	ovata	LAMIACEAE
*	0	**Secale**	**cereale**	POACEAE
*	0	**Sedum**	**acre**	CRASSULACEAE
*	0	**Sedum**	**album**	CRASSULACEAE
*	0	**Sedum**	**purpureum (S. telephium)**	CRASSULACEAE
*	0	**Sedum**	**sarmentosum**	CRASSULACEAE
	5	Sedum	ternatum	CRASSULACEAE
	9	Selaginella	apoda	SELAGINELLACEAE
E	10	Selaginella	rupestris	SELAGINELLACEAE
	3	Senecio	anonymus	ASTERACEAE
	5	Senecio	aureus	ASTERACEAE
*	0	**Senecio**	**glabellus**	ASTERACEAE
	5	Senecio	obovatus	ASTERACEAE
T	9	Senecio	pauperculus	ASTERACEAE
	5	Senecio	plattensis	ASTERACEAE
*	0	**Senecio**	**sylvaticus**	ASTERACEAE
*	0	**Senecio**	**vulgaris**	ASTERACEAE
	5	Senna	hebecarpa (Cassia h.)	CAESALPINIACEAE
	4	Senna	marilandica (Cassia m.)	CAESALPINIACEAE
*	0	**Setaria**	**faberi**	POACEAE

*	0	**Setaria**	**glauca**	POACEAE
*	0	**Setaria**	**italica**	POACEAE
*	0	**Setaria**	**verticillata**	POACEAE
*	0	**Setaria**	**viridis**	POACEAE
	8	Shepherdia	canadensis	ELAEAGNACEAE
*	0	**Sherardia**	**arvensis**	RUBIACEAE
	5	Sicyos	angulatus	CUCURBITACEAE
*	0	**Sida**	**spinosa**	MALVACEAE
	2	Silene	antirrhina	CARYOPHYLLACEAE
*	0	**Silene**	**armeria**	CARYOPHYLLACEAE
T	9	Silene	caroliniana var. pensylvanica	CARYOPHYLLACEAE
*	0	**Silene**	**conica**	CARYOPHYLLACEAE
*	0	**Silene**	**cserei**	CARYOPHYLLACEAE
*	0	**Silene**	**dichotoma**	CARYOPHYLLACEAE
*	0	**Silene**	**dioica (Lychnis d.)**	CARYOPHYLLACEAE
*	0	**Silene**	**latifolia (S. pratensis)**	CARYOPHYLLACEAE
*	0	**Silene**	**noctiflora**	CARYOPHYLLACEAE
	6	Silene	stellata	CARYOPHYLLACEAE
	7	Silene	virginica	CARYOPHYLLACEAE
*	0	**Silene**	**vulgaris**	CARYOPHYLLACEAE
E	9	Silphium	laciniatum	ASTERACEAE
	6	Silphium	perfoliatum	ASTERACEAE
	9	Silphium	terebinthinaceum	ASTERACEAE
	8	Silphium	trifoliatum	ASTERACEAE
*	0	**Silybum**	**marianum**	ASTERACEAE
*	0	**Sinapis**	**alba (Brassica a.)**	BRASSICACEAE
*	0	**Sinapis**	**arvensis (Brassica kaber)**	BRASSICACEAE
*	0	**Sisymbrium**	**altissimum**	BRASSICACEAE
*	0	**Sisymbrium**	**officinale**	BRASSICACEAE
	6	Sisyrinchium	albidum	IRIDACEAE
	4	Sisyrinchium	angustifolium	IRIDACEAE
E	10	Sisyrinchium	atlanticum	IRIDACEAE
X	10	Sisyrinchium	montanum	IRIDACEAE
E	10	Sisyrinchium	mucronatum	IRIDACEAE

	5	Sium	suave	APIACEAE
	5	Smilacina	racemosa	LILIACEAE
	9	Smilacina	stellata	LILIACEAE
X	10	Smilacina	trifolia	LILIACEAE
	6	Smilax	ecirrhata	SMILACACEAE
	6	Smilax	glauca	SMILACACEAE
	4	Smilax	herbacea	SMILACACEAE
	5	Smilax	hispida	SMILACACEAE
	4	Smilax	rotundifolia	SMILACACEAE
*	0	**Solanum**	**carolinense**	SOLANACEAE
*	0	**Solanum**	**dulcamara**	SOLANACEAE
	1	Solanum	nigrum	SOLANACEAE
*	0	**Solanum**	**rostratum**	SOLANACEAE
*	0	**Solanum**	**sarrachoides**	SOLANACEAE
*	0	**Solanum**	**tuberosum**	SOLANACEAE
	4	Solidago	bicolor	ASTERACEAE
	5	Solidago	caesia	ASTERACEAE
	1	Solidago	canadensis	ASTERACEAE
	6	Solidago	flexicaulis	ASTERACEAE
	2	Solidago	gigantea	ASTERACEAE
	5	Solidago	hispida	ASTERACEAE
	2	Solidago	juncea	ASTERACEAE
	3	Solidago	nemoralis	ASTERACEAE
	10	Solidago	ohioensis	ASTERACEAE
	8	Solidago	patula	ASTERACEAE
	10	Solidago	ptarmicoides	ASTERACEAE
	8	Solidago	riddellii	ASTERACEAE
	7	Solidago	rigida	ASTERACEAE
	3	Solidago	rugosa	ASTERACEAE
*	0	**Solidago**	**sempervirens**	ASTERACEAE
	5	Solidago	speciosa	ASTERACEAE
T	8	Solidago	squarrosa	ASTERACEAE
	8	Solidago	uliginosa	ASTERACEAE
	6	Solidago	ulmifolia	ASTERACEAE

*	0	**Sonchus**	**arvensis**	ASTERACEAE
*	0	**Sonchus**	**asper**	ASTERACEAE
*	0	**Sonchus**	**oleraceus**	ASTERACEAE
*	0	**Sorbaria**	**sorbifolia**	ROSACEAE
*	0	**Sorbus**	**aucuparia**	ROSACEAE
E	8	Sorbus	decora	ROSACEAE
	6	Sorghastrum	nutans	POACEAE
*	0	**Sorghum**	**bicolor**	POACEAE
*	0	**Sorghum**	**halepense**	POACEAE
	5	Sparganium	americanum	SPARGANIACEAE
E	9	Sparganium	androcladum	SPARGANIACEAE
	4	Sparganium	eurycarpum	SPARGANIACEAE
	7	Spartina	pectinata	POACEAE
*	0	**Spergula**	**arvensis**	CARYOPHYLLACEAE
*	0	**Spergularia**	**marina**	CARYOPHYLLACEAE
*	0	**Spergularia**	**media**	CARYOPHYLLACEAE
*	0	**Spergularia**	**rubra**	CARYOPHYLLACEAE
	8	Sphenopholis	nitida	POACEAE
	5	Sphenopholis	obtusata var. major (S. intermedia)	POACEAE
T	7	Sphenopholis	obtusata var. obtusata	POACEAE
	8	Sphenopholis	pensylvanica (Trisetum p.)	POACEAE
	3	Spiraea	alba var. alba	ROSACEAE
X	10	Spiraea	alba var. latifolia	ROSACEAE
	4	Spiraea	tomentosa	ROSACEAE
*	0	**Spiraea**	**x vanhouttei**	ROSACEAE
	5	Spiranthes	cernua var. cernua	ORCHIDACEAE
	5	Spiranthes	cernua var. ochroleuca	ORCHIDACEAE
	6	Spiranthes	lacera var. gracilis	ORCHIDACEAE
	5	Spiranthes	lacera var. lacera	ORCHIDACEAE
	8	Spiranthes	lucida	ORCHIDACEAE
	9	Spiranthes	magnicamporum	ORCHIDACEAE
E	10	Spiranthes	romanzoffiana	ORCHIDACEAE
	6	Spiranthes	tuberosa	ORCHIDACEAE
	8	Spiranthes	vernalis	ORCHIDACEAE

	5	Spirodela	polyrhiza	LEMNACEAE
	3	Sporobolus	asper	POACEAE
	8	Sporobolus	cryptandrus	POACEAE
	3	Sporobolus	neglectus	POACEAE
	5	Sporobolus	vaginiflorus	POACEAE
*	0	**Stachys**	**aspera**	LAMIACEAE
	7	Stachys	cordata (S. nuttallii)	LAMIACEAE
*	0	**Stachys**	**germanica**	LAMIACEAE
	6	Stachys	palustris	LAMIACEAE
	4	Stachys	tenuifolia	LAMIACEAE
	6	Staphylea	trifolia	STAPHYLEACEAE
*	0	**Stellaria**	**aquatica (Myosoton a.)**	CARYOPHYLLACEAE
*	0	**Stellaria**	**graminea**	CARYOPHYLLACEAE
	5	Stellaria	longifolia	CARYOPHYLLACEAE
*	0	**Stellaria**	**media**	CARYOPHYLLACEAE
	5	Stellaria	pubera	CARYOPHYLLACEAE
T	9	Stenanthium	gramineum	LILIACEAE
T	10	Stipa	spartea	POACEAE
E	10	Streptopus	roseus	LILIACEAE
	3	Strophostyles	helvola	FABACEAE
	6	Stylophorum	diphyllum	PAPAVERACEAE
*	0	**Suaeda**	**calceoliformis**	CHENOPODIACEAE
X	10	Symphoricarpos	albus var. albus	CAPRIFOLIACEAE
*	0	**Symphoricarpos**	**albus var. laevigarus**	CAPRIFOLIACEAE
*	0	**Symphoricarpos**	**occidentalis**	CAPRIFOLIACEAE
	4	Symphoricarpos	orbiculatus	CAPRIFOLIACEAE
*	0	**Symphytum**	**asperum**	BORAGINACEAE
*	0	**Symphytum**	**officinale**	BORAGINACEAE
	6	Symplocarpus	foetidus	ARACEAE
*	0	**Syringa**	**vulgaris**	OLEACEAE
	6	Taenidia	integerrima	APIACEAE
*	0	**Tamarix**	**gallica**	TAMARICACEAE
*	0	**Tanacetum**	**vulgare**	ASTERACEAE
*	0	**Taraxacum**	**laevigatum**	ASTERACEAE

*	0	**Taraxacum**	**officinale**	ASTERACEAE
*	0	**Taxodium**	**distichum**	TAXODIACEAE
	9	Taxus	canadensis	TAXACEAE
	6	Tephrosia	virginiana	FABACEAE
	3	Teucrium	canadense var. canadense	LAMIACEAE
	4	Teucrium	canadense var. occidentale	LAMIACEAE
	7	Thalictrum	dasycarpum	RANUNCULACEAE
	6	Thalictrum	dioicum	RANUNCULACEAE
	4	Thalictrum	pubescens	RANUNCULACEAE
	7	Thalictrum	revolutum	RANUNCULACEAE
	4	Thaspium	barbinode	APIACEAE
	3	Thaspium	trifoliatum	APIACEAE
	7	Thelypteris	hexagonoptera	THELYPTERIDACEAE
	5	Thelypteris	noveboracensis	THELYPTERIDACEAE
	5	Thelypteris	palustris	THELYPTERIDACEAE
	9	Thelypteris	phegopteris	THELYPTERIDACEAE
*	0	**Thlaspi**	**arvense**	BRASSICACEAE
*	0	**Thlaspi**	**perfoliatum**	BRASSICACEAE
**	0	Thuja	occidentalis	CUPRESSACEAE
*	0	**Thymus**	**serpyllum**	LAMIACEAE
	5	Tiarella	cordifolia	SAXIFRAGACEAE
	6	Tilia	americana	TILIACEAE
	8	Tipularia	discolor	ORCHIDACEAE
	10	Tofieldia	glutinosa	LILIACEAE
*	0	**Torilis**	**japonica**	APIACEAE
	1	Toxicodendron	radicans (Rhus r.)	ANACARDIACEAE
	7	Toxicodendron	rydbergii (Rhus radicans)	ANACARDIACEAE
	8	Toxicodendron	vernix (Rhus v.)	ANACARDIACEAE
*	0	**Tradescantia**	**bracteata**	COMMELINACEAE
	7	Tradescantia	ohiensis	COMMELINACEAE
	8	Tradescantia	virginiana	COMMELINACEAE
*	0	**Tragopogon**	**dubius**	ASTERACEAE
*	0	**Tragopogon**	**porrifolius**	ASTERACEAE
*	0	**Tragopogon**	**pratensis**	ASTERACEAE

	8	Triadenum	fraseri (Hypericum f.)	CLUSIACEAE
	7	Triadenum	virginicum (Hypericum v.)	CLUSIACEAE
*	0	**Tribulus**	**terrestris**	ZYGOPHYLLACEAE
	8	Trichostema	dichotomum	LAMIACEAE
E	9	Trichostema	setaceum (T. lineare)	LAMIACEAE
	3	Tridens	flavus	POACEAE
	9	Trientalis	borealis	PRIMULACEAE
*	0	**Trifolium**	**arvense**	FABACEAE
*	0	**Trifolium**	**aureum**	FABACEAE
*	0	**Trifolium**	**campestre**	FABACEAE
*	0	**Trifolium**	**dubium**	FABACEAE
*	0	**Trifolium**	**hybridum**	FABACEAE
*	0	**Trifolium**	**incarnatum**	FABACEAE
*	0	**Trifolium**	**pratense**	FABACEAE
E	8	Trifolium	reflexum	FABACEAE
*	0	**Trifolium**	**repens**	FABACEAE
T	9	Triglochin	maritimum	JUNCAGINACEAE
	9	Triglochin	palustre	JUNCAGINACEAE
X	10	Trillium	cernuum	LILIACEAE
	7	Trillium	erectum	LILIACEAE
	7	Trillium	flexipes	LILIACEAE
	6	Trillium	grandiflorum	LILIACEAE
	7	Trillium	sessile	LILIACEAE
T	9	Trillium	undulatum	LILIACEAE
	3	Triodanis	perfoliata	CAMPANULACEAE
	5	Triosteum	aurantiacum	CAPRIFOLIACEAE
	5	Triosteum	perfoliatum	CAPRIFOLIACEAE
T	8	Triphora	trianthophora	ORCHIDACEAE
	9	Triplasis	purpurea	POACEAE
*	0	**Triticum**	**aestivum**	POACEAE
E	8	Trollius	laxus	RANUNCULACEAE
	8	Tsuga	canadensis	PINACEAE
*	0	**Tulipa**	**gesneria**	LILIACEAE
*	0	**Tussilago**	**farfara**	ASTERACEAE

	0	Typha	angustifolia	TYPHACEAE
	2	Typha	latifolia	TYPHACEAE
	0	Typha	x glauca	TYPHACEAE
	1	Ulmus	americana	ULMACEAE
	2	Ulmus	rubra	ULMACEAE
E	8	Ulmus	thomasii	ULMACEAE
	1	Urtica	dioica	URTICACEAE
E	10	Utricularia	cornuta	LENTIBULARIACEAE
	10	Utricularia	geminiscapa	LENTIBULARIACEAE
	10	Utricularia	gibba	LENTIBULARIACEAE
T	8	Utricularia	intermedia	LENTIBULARIACEAE
T	8	Utricularia	minor	LENTIBULARIACEAE
	7	Utricularia	vulgaris	LENTIBULARIACEAE
	5	Uvularia	grandiflora	LILIACEAE
	5	Uvularia	perfoliata	LILIACEAE
	5	Uvularia	sessilifolia	LILIACEAE
*	0	**Vaccaria**	**hispanica**	CARYOPHYLLACEAE
	7	Vaccinium	angustifolium	ERICACEAE
	5	Vaccinium	corymbosum	ERICACEAE
	8	Vaccinium	macrocarpon	ERICACEAE
E	10	Vaccinium	myrtilloides	ERICACEAE
E	9	Vaccinium	oxycoccos	ERICACEAE
	6	Vaccinium	pallidum	ERICACEAE
	7	Vaccinium	stamineum	ERICACEAE
*	0	**Valeriana**	**officinalis**	VALERIANACEAE
	7	Valeriana	pauciflora	VALERIANACEAE
X	10	Valeriana	uliginosa	VALERIANACEAE
	4	Valerianella	chenopodifolia	VALERIANACEAE
*	0	**Valerianella**	**locusta**	VALERIANACEAE
*	0	**Valerianella**	**radiata**	VALERIANACEAE
	3	Valerianella	umbilicata	VALERIANACEAE
	8	Vallisneria	americana	HYDROCHARITACEAE
	10	Veratrum	viride	LILIACEAE
*	0	**Verbascum**	**blattaria**	SCROPHULARIACEAE

*	0	**Verbascum**	**thapsus**	SCROPHULARIACEAE
*	0	**Verbena**	**bracteata**	VERBENACEAE
*	0	**Verbena**	**canadensis**	VERBENACEAE
	4	Verbena	hastata	VERBENACEAE
	5	Verbena	simplex	VERBENACEAE
	5	Verbena	stricta	VERBENACEAE
	4	Verbena	urticifolia	VERBENACEAE
	4	Verbena	x engelmannii	VERBENACEAE
	4	Verbesina	alternifolia	ASTERACEAE
*	0	**Verbesina**	**virginica**	ASTERACEAE
	7	Vernonia	fasciculata	ASTERACEAE
	3	Vernonia	gigantea	ASTERACEAE
E	7	Vernonia	missurica	ASTERACEAE
*	0	**Veronica**	**agrestis**	SCROPHULARIACEAE
	3	Veronica	americana	SCROPHULARIACEAE
	6	Veronica	anagallis-aquatica	SCROPHULARIACEAE
*	0	**Veronica**	**arvensis**	SCROPHULARIACEAE
	3	Veronica	catenata	SCROPHULARIACEAE
*	0	**Veronica**	**chamaedrys**	SCROPHULARIACEAE
*	0	**Veronica**	**filiformis**	SCROPHULARIACEAE
*	0	**Veronica**	**hederaefolia**	SCROPHULARIACEAE
*	0	**Veronica**	**longifolia**	SCROPHULARIACEAE
*	0	**Veronica**	**officinalis**	SCROPHULARIACEAE
	1	Veronica	peregrina	SCROPHULARIACEAE
*	0	**Veronica**	**persica**	SCROPHULARIACEAE
*	0	**Veronica**	**polita**	SCROPHULARIACEAE
	4	Veronica	scutellata	SCROPHULARIACEAE
*	0	**Veronica**	**serpyllifolia**	SCROPHULARIACEAE
*	0	**Veronica**	**teucrium (V. latifolia)**	SCROPHULARIACEAE
	9	Veronicastrum	virginicum	SCROPHULARIACEAE
	6	Viburnum	acerifolium	CAPRIFOLIACEAE
	10	Viburnum	alnifolium	CAPRIFOLIACEAE
	2	Viburnum	dentatum var. dentatum	CAPRIFOLIACEAE
	2	Viburnum	dentatum var. lucidum (V. recognitum)	CAPRIFOLIACEAE

*	0	**Viburnum**	**lantana**	CAPRIFOLIACEAE
	6	Viburnum	lentago	CAPRIFOLIACEAE
	7	Viburnum	nudum var. cassinoides (V. cassinoides)	CAPRIFOLIACEAE
T	8	Viburnum	opulus var. americanum	CAPRIFOLIACEAE
*	0	**Viburnum**	**opulus var. opulus**	CAPRIFOLIACEAE
	5	Viburnum	prunifolium	CAPRIFOLIACEAE
	8	Viburnum	rafinesquianum var. affine	CAPRIFOLIACEAE
	8	Viburnum	rafinesquianum var. rafinesquianum	CAPRIFOLIACEAE
	5	Vicia	americana	FABACEAE
*	0	**Vicia**	**angustifolia**	FABACEAE
	7	Vicia	caroliniana	FABACEAE
*	0	**Vicia**	**cracca**	FABACEAE
*	0	**Vicia**	**hirsuta**	FABACEAE
*	0	**Vicia**	**sativa**	FABACEAE
*	0	**Vicia**	**villosa**	FABACEAE
*	0	**Vinca**	**minor**	APOCYNACEAE
*	0	**Vincetoxicum**	**nigrum (Cynanchum n.)**	ASCLEPIADACEAE
*	0	**Viola**	**arvensis**	VIOLACEAE
	5	Viola	blanda (incl. V. incognita)	VIOLACEAE
	5	Viola	canadensis	VIOLACEAE
	6	Viola	conspersa	VIOLACEAE
	7	Viola	cucullata	VIOLACEAE
	8	Viola	hastata	VIOLACEAE
	9	Viola	lanceolata	VIOLACEAE
	8	Viola	macloskeyi var. pallens	VIOLACEAE
E	10	Viola	nephrophylla	VIOLACEAE
*	0	**Viola**	**odorata**	VIOLACEAE
	6	Viola	palmata (incl. V. triloba)	VIOLACEAE
T	9	Viola	pedata	VIOLACEAE
E	8	Viola	primulifolia	VIOLACEAE
	5	Viola	pubescens	VIOLACEAE
	3	Viola	rafinesquii	VIOLACEAE
	6	Viola	rostrata	VIOLACEAE
	8	Viola	rotundifolia	VIOLACEAE

	6	Viola	sagittata (incl. V. fimbriatula)	VIOLACEAE
	2	Viola	sororia (incl. V. affinis)	VIOLACEAE
	5	Viola	striata	VIOLACEAE
*	0	**Viola**	**tricolor**	VIOLACEAE
	8	Viola	villosa (V. hirsutula)	VIOLACEAE
	6	Viola	x brauniae	VIOLACEAE
	6	Vitis	aestivalis	VITACEAE
	8	Vitis	labrusca	VITACEAE
	4	Vitis	riparia	VITACEAE
	3	Vitis	vulpina	VITACEAE
	10	Vittaria	lineata	ADIANTACEAE
	5	Vulpina	octoflora (Festuca o.)	POACEAE
	7	Waldsteinia	fragarioides	ROSACEAE
	6	Wolffia	columbiana	LEMNACEAE
	10	Wolffia	papulifera	LEMNACEAE
	6	Wolffia	punctata	LEMNACEAE
T	8	Wolffiella	floridana	LEMNACEAE
	9	Woodsia	obtusa	ASPLENIACEAE
T	8	Woodwardia	areolata	BLECHNACEAE
	9	Woodwardia	virginica	BLECHNACEAE
*	0	**Xanthium**	**spinosum**	ASTERACEAE
*	0	**Xanthium**	**strumarium**	ASTERACEAE
E	10	Xyris	difformis	XYRIDACEAE
T	8	Xyris	torta	XYRIDACEAE
*	0	**Yucca**	**filamentosa**	AGAVACEAE
	8	Zannichellia	palustris	ZANNICHELLIACEAE
	5	Zanthoxylum	americanum	RUTACEAE
*	0	**Zea**	**mays**	POACEAE
T	8	Zizania	aquatica	POACEAE
	7	Zizia	aurea	APIACEAE
	10	Zygadenus	elegans var. glaucus	LILIACEAE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	August 1995	Final report

4. TITLE AND SUBTITLE
Floristic Index for Establishing Assessment Standards: A Case Study for Northern Ohio

5. FUNDING NUMBERS

6. AUTHOR(S)
Barbara K. Andreas, Robert W. Lichvar

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Cuyahoga Community College, Cleveland, OH 44122;
Kent State University, Kent, OH 44242;
U.S. Army Engineer Waterways Experiment Station
3909 Halls Ferry Road, Vicksburg, MS 39180-6199

8. PERFORMING ORGANIZATION REPORT NUMBER
Technical Report
WRP-DE-8

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
U.S. Army Corps of Engineers, Washington, DC 20314-1000

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES
Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

The Floristic Quality Assessment System was developed as a tool to provide a numerical value (Floristic Quality Assessment Index) for a natural area evaluation based on plant species present. The index allows for objective numerical comparison of two unrelated plant community types.

A numerical rating, called the coefficient of conservation was assigned to 2,063 species of plants and 30 interspecific hybrids (Appendix A). Appendix A contains a checklist of the vascular flora of 31 Ohio counties, including those counties present within the Buffalo District of the U.S. Army Corps of Engineers.

Native species were assigned coefficient of conservatism values of 0 to 10. The rank of 0 was assigned to native taxa that are opportunistic invaders of natural areas and those that are typically part of ruderal communities. Rankings of 9 to 10 were used for those taxa that exhibit relatively high degrees of fidelity to a narrow range of synecological parameters. All alien (nonnative) taxa were assigned a value of 0.

The Floristic Quality Assessment Index (I) can be determined for any natural area from the tabulation of the coefficient of conservatism values. A higher index value expresses a natural area containing mostly native species, whereas a lower index value reflects human disturbance by taking into account the presence of alien (nonnative) taxa.

14. SUBJECT TERMS
Coefficient of conservatism
Disturbance
Exotic species
Natural areas assessment

15. NUMBER OF PAGES
87

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED		