

# APPENDIX A

APPENDIX A

**KEY TO THE WETLAND GOLDENRODS (*Solidago*)  
OF MINNESOTA AND WISCONSIN**

[Modified from Gleason and Cronquist (1991)  
and Swink and Wilhelm (1994)]

1A. Flowering heads are flat-topped (inflorescence is a corymb).

2A. Leaves of lower and upper stem are dissimilar, the lower or basal leaves being better developed and usually persistent; leaves are not glandular-punctate; typically occur on calcareous soils.

3A. Branches and pedicels of the inflorescence are glabrous; leaves are flat and not triple nerved ..... *Solidago ohioensis*

3B. Branches and pedicels of the inflorescence are pubescent; leaves tend to be sickle-shaped (falcate), folded (conduplicate), and triple nerved ..... *Solidago riddellii*

2B. Leaves linear (narrow), similar on lower and upper stem, and glandular-punctate (use a 10-15X hand lens); stems are pubescent; tends to be clonal ..... *Euthamia graminifolia*<sup>1</sup>

1B. Flowering heads occur in axillary clusters, racemes, panicles or thyrses, but never as a corymb.

4A. Inflorescence spreading, with recurved-secund branching. Branches and branchlets of the inflorescence are pubescent.

5A. Leaves very scabrous above; basal and lower cauline leaves persistent and very large; stem generally angled in cross section; typically occurs in calcareous fens and shaded seeps .....  
..... *Solidago patula*

5B. Leaves triple nerved, not scabrous; leaves of lower and upper stem tend to be similar; stem glabrous and glaucous below the inflorescence and not angled; tends to be clonal .....  
..... *Solidago gigantea*

4B. Inflorescence much longer than broad; branches rather short and not recurved-secund; branches and branchlets of the inflorescence are not pubescent (but may be puberulent). Stems not angled, nor glaucous below the inflorescence; typically occurs in both bogs and fens .....  
..... *Solidago uliginosa*

<sup>1</sup> Formerly known as *Solidago graminifolia*.

# APPENDIX B

APPENDIX B

**KEY TO THE WETLAND ASTERS OF MINNESOTA AND WISCONSIN**

[Modified from Gleason and Cronquist (1991)  
and Swink and Wilhelm (1994)]

1A. Involucral bracts and peduncles glandular-pubescent; leaves auriculate-clasping; herbage often glandular; rays very numerous, violet or amethyst to rosy, rarely blue or white; large discs yellow to yellow-orange, distinctive .....*Symphyotrichum novae-angliae*

1B. Plant with inflorescence pubescent or glabrous, but not glandular.

2A. Stem leaves with perfoliate or auriculate-clasping bases.

3A. Stems reddish, coarsely hispid; leaves not serrate and not conspicuously crowded; inner involucral bracts taper to a slender tip; rays violet; nutlets glabrous; clonal .....  
.....*Symphyotrichum puniceum*

3B. Stems green or with purple lines or nodes, glabrous or sparingly hispid; leaves not serrate but conspicuously crowded, particularly towards the inflorescence; inner involucral bracts taper to a slender tip; rays very pale blue or lavender; nutlets pubescent; clonal .....*Symphyotrichum firmum*

3C. Stems zig-zag and pubescent to glabrous toward the base; leaves nearly perfoliate and coarsely serrate; rays blue to pale purple; nutlets strigose; not clonal; rare .....  
.....*Symphyotrichum prenanthoides*

2B. Stem leaves usually not clasping at the base (not auriculate).

4A. Flowering heads are flat-topped (inflorescence is a corymb); rays white; not clonal ....  
.....*Doellingeria umbellata*

4B. Flowering heads not flat-topped.

5A. Stem leaves entire or serrate, more than 8 mm. wide, not linear.

6A. Leaves pubescent beneath; rays white to slightly purple .....  
.....*Symphyotrichum ontarionis*

6B. Leaves glabrous or only pubescent along the veins.

7A. Leaves entire or subentire, 5 times as long as wide; usually scabrous above; rays usually bluish-purple .....*Symphyotrichum praealtum*

7B. Leaves mostly serrate, usually less than 5 times as long as wide; usually not scabrous above.

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8A. Flower heads secund (racemes 1-sided); leaves usually villous or puberulent beneath, at least along the midrib; rays usually white; not clonal . . . . .*Symphyotrichum lateriflorum*

8B. Flower heads form a panicle and are usually not secund; inflorescence leafy; leaves are usually glabrous beneath, except for occasionally ciliated margins; rays usually white; clonal . . . . .*Symphyotrichum lanceolatum*

5B. Leaves essentially entire, less than 8 mm. wide, linear.

9A. Leaves yellowish green, with revolute margins, generally scabrous above; areolae isodiametric . . . . .*Symphyotrichum praealtus*

9B. Leaves green to dark green, margins not revolute, glabrous or scabrous. areolae mostly rectangular.

10A. Ray flowers about 10 mm. long; flower heads few, subcorymbose, terminal; plant slender; rays white to pale lavender; typically found in open cold bogs and open fens . . . . .*Symphyotrichum boreale*

10B. Ray flowers less than 10 mm. long; flower heads numerous, forms a panicle; plant stouter; generally not found in cold bogs . . . . .*Symphyotrichum lanceolatum*

# APPENDIX C

APPENDIX C

KEY TO THE *UTRICULARIA* SPECIES  
OF  
MINNESOTA AND WISCONSIN

-Donald M. Reed-

- 1A. Leaves minute, simple and filiform or narrowly linear; leaves and bladders<sup>1</sup>  
embedded in substrate; not free floating; flowers 1-6 on scape:
- 2A. Flowers yellow, spur down curved; bracts accompanied each by a pair of  
branchlets .....*U. cornuta*
- 2B. Flowers violet, spur up curved; bracts not accompanied by branchlets  
.....*U. resupinata*
- 1B. Leaves dichotomously branched or dissected, not minute; leaves all or mostly on  
stems in the water, free floating; flowers 1 – 20 on scape(s):
- 3A. Upper leaves in whorls (4-9); bladders borne at leaf segment apex; flowers rose  
-purple.....*U. purpurea*
- 3B. Upper leaves alternate; bladders borne at base or on sides of leaf segments;  
flowers yellow:
- 4A. Leaf segments flattened, nearly to fully as wide as the primary segments;  
lower corolla lip about 2 times as long as the upper lip:
- 5A. Bladders located on specialized branches lacking leaves; leaf segment  
margins spinulose-toothed; lower corolla lip 8-12 mm with well developed  
palate.....*U. intermedia*
- 5B. Bladders located on leafy branches; leaf segments entire; lower corolla lip  
4-8 mm with small or no palate.....*U. minor*
- Note: The taxonomy of *Utricularia x ochroleuca*, which would be located in this couplet,  
is disputed and is treated here as the hybrid *Utricularia intermedia x minor*.
- 4B. Leaf segments terete, filiform, progressively narrower in successive  
segments; lower and upper corolla lips essentially equal in length:

<sup>1</sup>Tans (1987) notes that *U. cornuta* may occasionally lack bladder-traps.

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- 6A. Leaf segments with many bladders, stems loosely floating beneath water surface; flowers mostly 6-20 per peduncle; plants large, robust, more than 30 cm. long:
- 7A. Peduncles with 1- few widely scattered bract-like scales below the lowest bract; emergent scapes 1 mm. or more in diameter; lower corolla lip 1-2 cm. long.....*U. macrorhiza*
- 7B. Peduncles without scales below the lowest bract; emergent scapes less than 1 mm. in diameter; lower corolla lip 6-8 mm. long...  
.....*U. geminiscapa*
- 6B. Leaf segments with 1-few bladders, stems forming tangled mats beneath water surface; flowers 1-6 per peduncle; plants small, slender, less than 30 cm. long.....*U. gibba*

Sources: Crow and Hellquist (2000); Gleason and Cronquist (1991); R.L. McGregor *et al.* (1991); Swink and Wilhelm (1994); Tans (1987); and Voss (1996).

# GLOSSARY

**acid:** having more hydrogen ions than hydroxyl ions: a pH of less than 7.

**aerobic:** a condition in which free molecular oxygen is present.

**alien:** a non-native (introduced) species, which may or may not be naturalized.

**alkaline:** basic, having more hydroxyl ions than hydrogen ions; a pH of greater than 7.

**anaerobic:** a condition in which free molecular oxygen is absent.

**annual:** a plant that completes its life cycle in one growing season, then dies.

**auriculate:** having ear-shaped lobes at the base.

**awn:** a bristle, often located in a terminal position on a specific plant part.

**axil:** the upper angle formed between the axis and a lateral organ such as a leaf or branch that arises from it

**beak:** a relatively stout tip such as on a nutlet.

**biennial:** a plant that completes its life cycle in two years, usually flowering and producing fruit the second year, and then dies.

**calcareous:** limy, rich in calcium, usually in the form of calcium carbonates.

**calciphile:** a plant species with a high tolerance of calcium.

**callosities:** a hardened thickening of plant tissue.

**calyx:** the frequently green outer series of floral leaves (or sometimes the only ones); the sepals collectively.

**CFR:** Code of Federal Regulations.

**clasping:** partly surrounding another organ at the base.

**clonal:** forming clones.

**clone:** a group of vegetatively produced, genetically identical individuals.

**colonial:** forming colonies.

**colony:** a group of individuals of the same species produced vegetatively, or by seed, that may or may not be genetically identical.

## GLOSSARY

- community:** in reference to plants, an interacting assemblage of plant populations sharing a given habitat.
- composite:** a member of the aster family (Compositae).
- corolla:** the inner series of floral leaves, often showy; the petals collectively.
- dbh:** diameter at breast height; a measure of tree diameter at 4.5 feet above the ground or root collar.
- deciduous:** falling off, usually at a certain season after completion of the normal function.
- dichotomous:** forking into two directions of essentially equal branches.
- dioecious:** producing male and female flowers on different individual plants
- disc:** in the aster family (Compositae), a group of tubular flowers located in the central part of the flower head.
- dolomite:** in Minnesota and Wisconsin, a bedrock mineral consisting of calcium magnesium carbonate ( $\text{CaMg}(\text{CO}_3)_2$ ).
- dominant:** a species that exerts a considerable influence on, or defines the character of, a community because of such factors as its number, coverage, and/or size.
- ericaceous:** refers to members of the heath family (Ericaceae).
- fen:** in a broad sense, wetlands that are predominately supported by groundwater discharge; fens can be segregated by soil chemistry, water chemistry and vegetation, e.g., calcareous fens.
- floret:** a small or reduced flower, such as that of grasses.
- follicle:** a dry fruit that splits open along one seam.
- forbs:** herbaceous plants, excluding the grasses, rushes and sedges; especially used to describe broad-leaved, flowering plants.
- frond:** the leaf of ferns; also, the vegetative structure of duckweeds (Lemnaceae) that is not differentiated into stem and leaf.
- genus:** the first part of the scientific name for an organism, always capitalized (plural, genera).
- glabrous:** smooth.
- glaucous:** covered with a pale, waxy coating or “bloom.”
- glume:** a specialized, scale-like leaf at the base of a grass spikelet.
- graminoid:** grass-like plants including grasses, sedges and rushes.
- growing season:** that portion of the year when soil temperatures at 19.7 inches below the surface exceed biologic zero (41 degrees F.). This can be approximated by the number of frost-free days (i.e., the period between the last frost of spring and first frost of autumn).
- herb:** a herbaceous (non-woody) plant.

## GLOSSARY

**hispid:** having rigid hairs.

**hybrid:** a cross-breed between two species.

**hydric soils:** soils formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part.

**hydrophyte:** a plant that grows in water or on a substrate saturated at a frequency and duration during the growing season sufficient to affect plant occurrence.

**hypersaline:** extremely salty; very high concentration of dissolved salts.

**inflorescence:** the entire flower cluster of a plant.

**isodiametric:** having equal diameters.

**keel:** a longitudinal ridge (like the keel of a boat).

**lagg:** a moat, or open water area at the border between a bog and uplands.

**leaflet:** one of the blades of a compound leaf.

**lemma:** the lowermost scale-like leaves at the base of a grass floret.

**lenticel:** a small dot (opening) on the bark of young trees or shrubs.

**ligule:** in the grasses (Gramineae), a papery extension at the summit of a leaf sheath.

**lip:** one part of a two-lipped (bilabiate) flower; in the orchids (Orchidaceae), the odd petal that is usually the lowest.

**macroscopic:** visible without magnification.

**-merous:** A Greek suffix referring to the number of members of a set, e.g., 5-merous meaning that flower parts are in 5s.

**mesic:** intermediate between dry and wet conditions, moderately moist.

**mixosaline:** of intermediate salinity; somewhat salty.

**monoecious:** with unisexual flowers, both types borne on the same individual plant.

**monotype:** a plant community consisting of only one species.

**muck:** a soil consisting of partially decomposed plant remains where the decomposition has progressed to a point where the contributing plant species cannot be identified; an organic soil as opposed to mineral soils.

**native:** an indigenous species.

**nerve:** a ridge or vein on a plant structure.

**nonpersistent emergent:** an aquatic emergent plant whose upper portions (stems, leaves) die back at the end of the growing season (e.g., arrowhead).

## GLOSSARY

- nutlet:** a small dry fruit that does not split open along a seam or surface; as used herein, synonymous with achene.
- ocrea:** a stipular, tube-shaped sheath that surrounds the stem just above the leaf base; a characteristic of the smartweed family (Polygonaceae).
- oogonia:** eggs of algae.
- ovary:** the lower, usually enlarged portion of the pistil, in which the seeds are produced.
- peat:** a soil consisting of partially decomposed plant remains in which the contributing plant species can still be identified; an organic soil as opposed to mineral soils.
- pedicel:** the stalk of a single flower.
- perennial:** a plant species living three or more years.
- perfect flower:** a flower having both pistils and stamens.
- perigynium:** a flask-like papery structure that surrounds the ovary in *Carex* (plural, perigynia).
- persistent emergent:** an aquatic emergent plant that remains standing through the winter and at least until the start of the next growing season (e.g., cattails).
- petiole:** the stalk of a leaf.
- pinnae:** one of the primary lateral divisions of a pinnately compound leaf.
- pinnatifid:** a deeply lobed, pinnate-like pattern cut along a central axis; the inter-segmented clefts, however, do not reach the axis.
- pioneer:** a plant species that characteristically first colonizes exposed soils.
- pistil:** the seed producing organ of a flower, composed of an ovary, and one or more styles and stigmas.
- pistillate:** having only pistils (lacking staminate (pollen-producing) organs).
- pith:** the spongy central portion of stems and branches.
- prostrate:** laying flat on the ground.
- pubescent:** hairy.
- punctate:** dotted.
- rachis:** a main axis, such as that of a compound leaf.
- ray:** in the aster family (Compositae), a strap-shaped marginal flower radiating from the flower head.
- receptacle:** in the aster family (Compositae), an enlarged summit of the flower stalk to which the flowers are attached.
- recurved:** curved backward.

## GLOSSARY

- revolute:** having the margins rolled backward.
- rhizome:** an underground stem, usually growing horizontally.
- rosette:** a dense, circular, clump of leaves.
- saline:** salty; having a high concentration of dissolved salts.
- samara:** a dry fruit that does not split open along a seam and has a well-developed wing.
- scabrous:** rough.
- scale:** a minute, modified leaf subtending an individual flower, especially referring to sedges (Cyperaceae).
- secund:** arranged along only one side of the axis.
- sepal:** a single segment of the calyx, usually green.
- septate:** with hard cross partitions.
- sessile:** lacking a stalk.
- siliqua:** a seed pod consisting of 2 fused flower pistils, usually longer than wide. The outer walls of the fused pistil (referred to as valves) typically separate when ripe leaving a persistent partition (the replum). Shorter seed pods of similar structure are called a silicle. These seed pods are characteristic of the mustard family (Cruciferae).
- sorus:** a cluster of sporangia, as in ferns (plural: sori).
- spikelet:** a small spike with reduced flowers on a central axis; applied to the flower cluster (inflorescence) of grasses (Gramineae) and sedges (Cyperaceae).
- sporangia:** a case or structure that contains spores.
- spur:** a flower part that is a hollow, pointed projection.
- stamen:** the male or pollen-producing organ of the flower.
- staminate:** having only stamens (lacking pistillate (seed producing) organs).
- stand:** a particular example of a plant community.
- stigma:** the terminal portion of a pistil which is receptive to pollen.
- stipe:** a stalk.
- stipule:** an appendage at the base of a leaf.
- stolon:** an above-ground, horizontal stem.
- strigose:** having straight, stiff hairs that are flattened along a surface.
- style:** the stalk-like portion of a pistil connecting the stigma and ovary.
- tepal:** in a given plant, sepals and petals that strongly resemble each other.
- thyrs:** an inflorescence resembling a compact panicle.

## GLOSSARY

**tuber:** a starchy, enlarged portion of a rhizome or root.

**tubercle:** a small enlargement or appendage, usually distinct in color or texture, as in the “cap” on the nutlet of spike-rushes.

**unisexual:** having only stamens (staminate) or pistils (pistillate).

**upland:** an area that does not have the hydrologic conditions necessary for the development of hydric (wetland) soils and establishment of wetland plant communities.

**whorl:** a group of three or more parts surrounding a node.

**villous:** having long, soft hairs that are not matted.

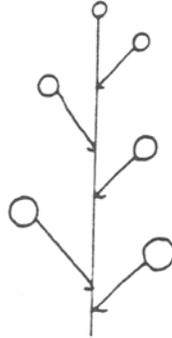
**wetlands (regulatory definition):** areas saturated or inundated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

**wetlands (scientific definition):** an ecosystem that depends on constant or recurrent, shallow inundation or saturation at or near the surface of the substrate. The minimum essential characteristics are recurrent, sustained inundation or saturation at or near the surface and the presence of physical, chemical and biological features reflective of recurrent, sustained inundation or saturation . Common diagnostic features of wetlands are hydric soils and hydrophytic vegetation. These features will be present except where specific physiochemical, biotic or anthropogenic factors have removed them or prevented their development (National Research Council 1995).

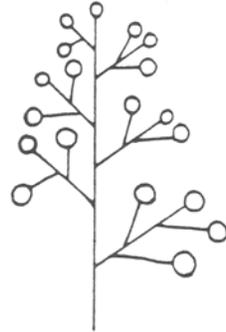
# GLOSSARY



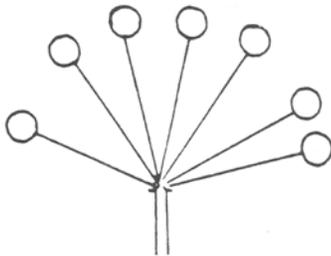
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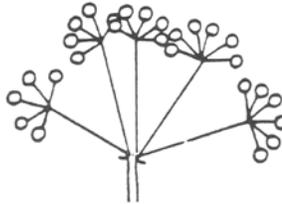
Raceme



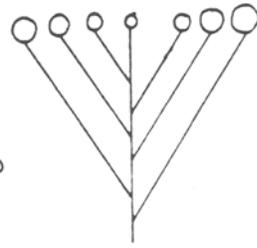
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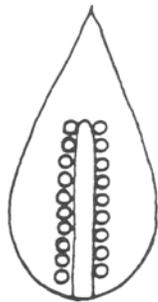
Umbel



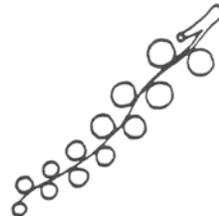
Compound Umbel



Corymb



Spathe and Spadix



Catkin

## Inflorescence Types

GLOSSARY



Linear



Oblong



Orbicular



Oval



Ovate



Heart-shaped



Lanceolate



Deltoid



Sagittate



Oval



Kidney-shaped



Obovate

**Leaf Shapes**

# GLOSSARY



Parallel



Pinnate



Palmate

## Leaf Venation



Entire



Crenate



Serrate



Doubly Serrate



Serrulate



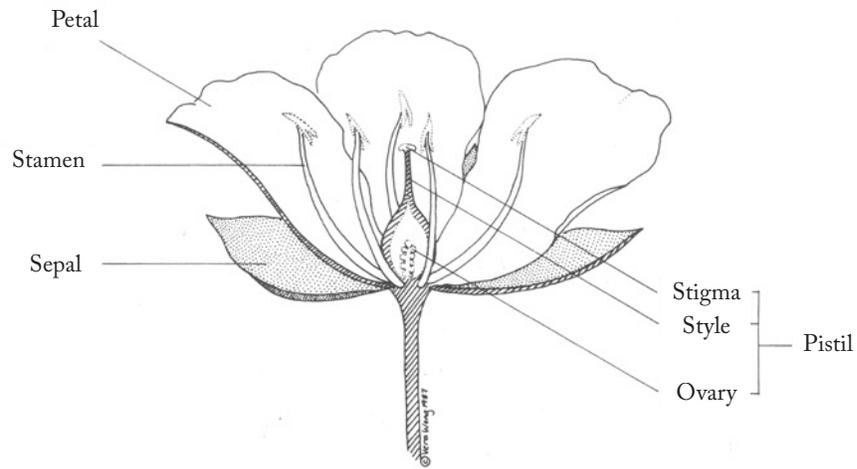
Ciliate



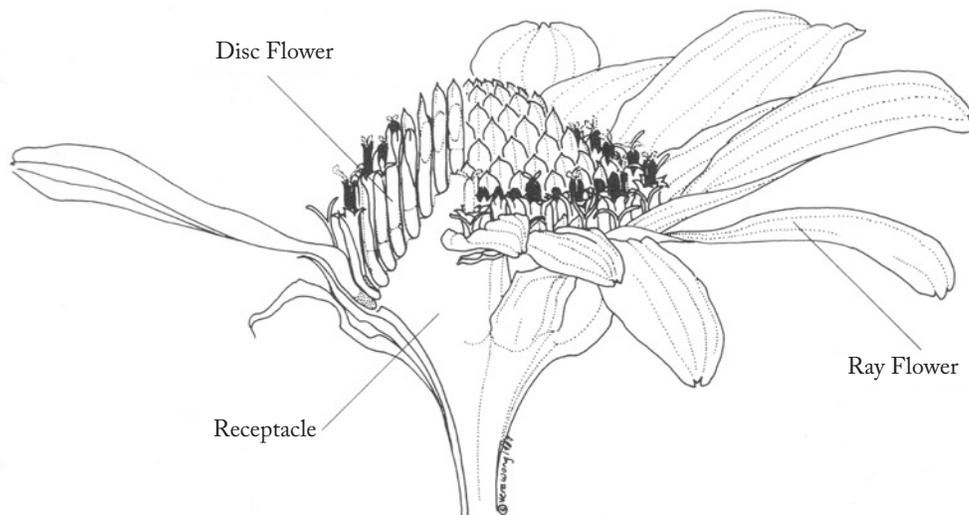
Dentate

## Leaf Margins

## GLOSSARY

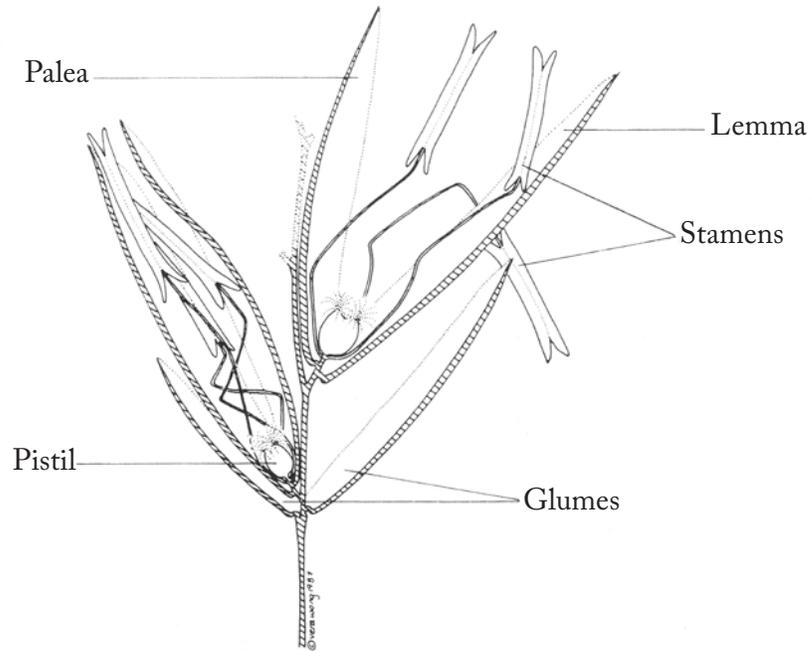


**Cross Section of a Typical Flower**

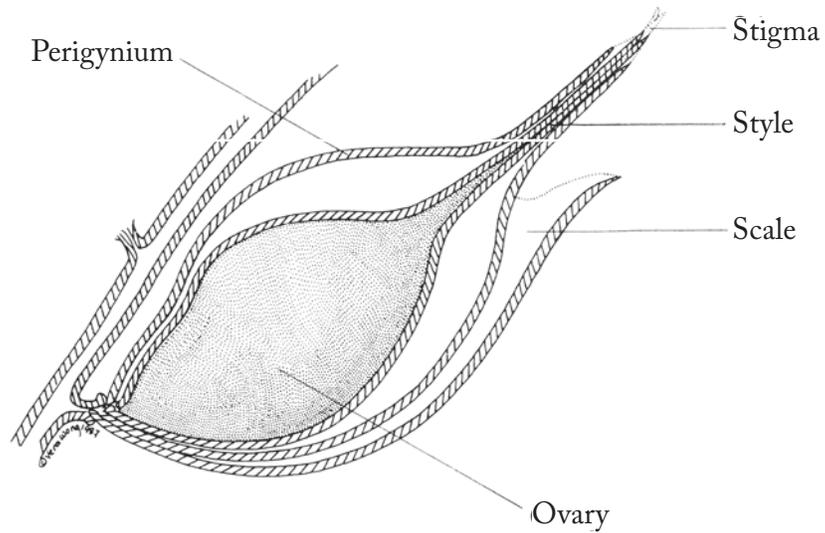


**Cross Section of a Typical Composite Flower (Compositae)**

GLOSSARY



**Cross Section of a Typical Grass Spikelet**



**Cross Section of a Perigynium (*Carex*)**

# BIBLIOGRAPHY

- Almendinger, James and Jeanette Leete. 1998. *Peat Characteristics and Groundwater Geochemistry of Calcareous Fens in the Minnesota River Basin, USA*. *Biogeochemistry* Vol: 43, No. 1: 17-41.
- Bernthal, Thomas. 2003. *Development of a Floristic Quality Assessment Methodology for Wisconsin*. Wisconsin Department of Natural Resources, Bureau of Integrated Science Services, Madison, Wisconsin. PUB-SS-986 2003. 19 pp.
- Black, Merel and Emmet Judziewicz. 2009. *Wildflowers of Wisconsin and the Great Lakes Region – Second Edition*. University of Wisconsin Press, Madison, Wisconsin. 275 pp.
- Boelter, Don and Elton Verry. 1977. *Peatland and Water in the Northern Lake States*. U.S. Department of Agriculture, Forest Service, General Technical Report NC-31. 22 pp.
- Britton, Nathaniel and Addison Brown. 1970. *An Illustrated Flora of the Northern United States and Canada*. Volumes I-III. Dover Publications Inc., New York, New York. 2,052 pp.
- Brockman, Frank. 1979. *Trees of North America*. Golden Press, Western Publishing Company, Inc., Racine, Wisconsin. 280 pp.
- Chadde, Steve. 2002. *A Great Lakes Wetlands Flora – Second Edition*. PocketFlora Press, Laurium, Michigan. 648 pp.
- Chadde, Steve. 2011. *A Great Lakes Wetland Flora – Third Edition*. 649 pp.
- Coffin, Barbara and Lee Pfannmueller, Editors. 1988. *Minnesota's Endangered Flora and Fauna*. University of Minnesota Press, Minneapolis. 473 pp.
- Courtenay, Booth and James Zimmerman. 1972. *Wildflowers and Weeds*. D. Van Nostrand Company, New York. New York. 144 pp.
- Crow, Garrett and C. Barre Hellquist. 2000. *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison, WI. 536 pp.
- Cowardin, Lewis, Virginia Carter, Francis Golet, and Edward LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 103 pp.
- Crum, Howard. 1978. *Mosses of the Great Lakes Forest*. University Herbarium, University of Michigan, Ann Arbor, Michigan. 404 pp.
- Curtis, John. 1971. *The Vegetation of Wisconsin*. University of Wisconsin Press, Madison, Wisconsin. 657 pp.

## BIBLIOGRAPHY

- Elias, Thomas. 1980. *The Complete Trees of North America*. Van Nostrand Reinhold Company, New York, New York. 948 pp.
- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. 98 pp. plus appendices.
- Fassett, Norman. 1951. *Grasses of Wisconsin*. University of Wisconsin Press, Madison, Wisconsin. 173 pp.
- Fassett, Norman. 1957. *A Manual of Aquatic Plants*. University of Wisconsin Press, Madison, Wisconsin. 405 pp.
- Fassett, Norman. 1976. *Spring Flora of Wisconsin – Fourth Edition Revised* by Olive Thomson. University of Wisconsin Press. Madison, Wisconsin. 413 pp.
- Fernald, Merritt. 1970. *Gray's Manual of Botany*. D. Van Nostrand Company, New York, New York. 1,632 pp.
- Glaser, Paul, Gerald Wheeler, Eville Gorham, and Herbert Wright, Jr. 1981. *The Patterned Mires of the Red Lake Peatland, Northern Minnesota: Vegetation, Water Chemistry, and Landforms*. *Journal of Ecology* 69: 575-599.
- Glaser, Paul. 1987. *The Ecology of Patterned Boreal Peatlands of Northern Minnesota: A Community Profile*. Biol. Report 85(7.14). U.S. Fish and Wildlife Service, Washington, D.C. 98 pp.
- Gleason, Henry and Arthur Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*. D. Van Nostrand Company. New York, New York. 910 pp.
- Great Plains Flora Association. 1991. *Flora of the Great Plains*. University of Kansas Press, Lawrence, Kansas. 1,402 pp.
- Hipp, Andrew. 2008. *A Field Guide to Wisconsin Sedges*. University of Wisconsin Press, Madison, Wisconsin. 265 pp.
- Hitchcock, A.S. 1950. *Manual of the Grasses of the United States. Volumes One and Two*. Misc. Publication No. 200, U.S. Department of Agriculture. U.S. Government Printing Office, Washington, D.C. 1,451 pp.
- Holmgren, Noel. 1998. *The Illustrated Companion to Gleason and Cronquist's Manual – Illustrations of the Vascular Plants of Northeastern United States and Adjacent Canada*. The New York Botanical Garden, Bronx, New York. 937 pp.
- Johnson, Charles. 1985. *Bogs of the Northeast*. University Press of New England, Hanover, New Hampshire. 269 pp.
- Kartesz, John. 1994. *A Synonymized Checklist of the Vascular Flora of the United States, Canada and Greenland*. Timber Press, Portland, Oregon. 1,438 pp.

## BIBLIOGRAPHY

- Lichvar, Robert and Jennifer Gillrich. 2011. *Final Protocol for Assigning Wetland Indicator Status Ratings to the 2011 National Wetland Plant List*. ERDC/CRREL TN-11-1. Hanover, NH: U.S. Army Engineer Research and Development Center.
- Mack, John and Mary Kentula. 2010. *Metric Similarity in Vegetation-Based Wetland Assessment Methods*. EPA/600/R-10/140. U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C.
- Marschner, Francis. 1930. *The Original Vegetation of Minnesota*. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station, St. Paul. Minnesota.
- Martin, Alexander, Herbert Zim, and Arnold Nelson. 1951. *American Wildlife and Plants - A Guide to Wildlife Food Habits*. Dover Publications, Inc., New York, New York. 500 pp.
- Minnesota Department of Natural Resources. 2003. *Field Guide to the Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province*. Ecological Classification Program, Minnesota County Biological Survey, and Natural Heritage and Nongame Research Program. Minnesota DNR, St. Paul, MN. 352 pp.
- Minnesota Department of Natural Resources. 2005. *Field Guide to the Native Plant Communities of Minnesota: The Prairie Parkland and Tallgrass Aspen Parklands Provinces*. Ecological Classification Program, Minnesota County Biological Survey, and Natural Heritage and Nongame Research Program. Minnesota DNR, St. Paul, MN. 362 pp.
- Minnesota Department of Natural Resources. 2005. *Field Guide to the Native Plant Communities of Minnesota: The Eastern Broadleaf Forest Province*. Ecological Classification Program, Minnesota County Biological Survey, and Natural Heritage and Nongame Research Program. Minnesota DNR, St. Paul, MN. 394 pp.
- Mitsch, William and James Gosselink. 2000. *Wetlands - Third Edition*. Van Nostrand Reinhold Company, New York, New York. 920 pp.
- Milburn, Scott, Michael Bourdaghs and Jason Husveth. 2007. *Floristic Quality Assessment for Minnesota Wetlands*. Minnesota Pollution Control Agency, St. Paul, Minnesota. 197 pp.
- Mohlenbrock, Robert. 1972. *The Illustrated Flora of Illinois - Grasses (Bromus to Paspalum)*. Second Edition. Southern Illinois University Press. 404 pp.
- Mohlenbrock, Robert. 1973. *The Illustrated Flora of Illinois - Grasses (Panicum to Danthonia)*. Second Edition. Southern Illinois University Press. 455 pp.
- Mohlenbrock, Robert. 1999. *The Illustrated Flora of Illinois - Sedges: Carex*. Southern Illinois University Press. 328 pp.
- National Research Council. 1995. *Wetlands: Characteristics and Boundaries*. National Academy of Sciences, Washington, D.C.
- National Wetland Plant List, U.S. Army Corps of Engineers. <https://rsgis.crrel.usace.army.mil/apex/>

## BIBLIOGRAPHY

- Niering, William. 1994. *Wetland Vegetation Change: A Dynamic Process*. Wetland Journal Vol. 6, No. 4 (6-10).
- Ownbey, Gerald and Thomas Morley. 1991. *Vascular Plants of Minnesota – A Checklist and Atlas*. University of Minnesota Press, Minneapolis, Minnesota. 307 pp.
- Peterson, Roger and Margaret McKenny. 1968. *A Field Guide to Wildflowers of Northeastern and Northcentral North America*. Houghton Mifflin Company, Boston, Mass. 420 pp.
- Petrides, George. 1972. *A Field Guide to Trees and Shrubs*. Houghton Mifflin Company, Boston, Mass. 428 pp.
- Pohl, Richard. 1966. Grasses of Iowa. Iowa State Journal of Science Vol. 40, No. 4 (341-567).
- Reed, Porter. 1988. *National List of Plant Species That Occur in Wetlands – North Central (Region 3)*. National Wetland Inventory, U.S. Department of the Interior, Fish and Wildlife Service, St. Petersburg, Florida. 90 pp.
- Reed, Porter. 1996. (Draft) *National List of Vascular Plant Species That Occur in Wetlands: 1996 National Summary*. National Wetland Inventory. U.S. Department of the Interior, Fish and Wildlife Service, St. Petersburg, Florida. 462 pp.
- Sanders, Dale. 1982. Map of the prairie pothole region derived from the film: *Vital Heritage – Swamps, Bogs and Marshes*. Naturalist 33(1):1.
- Shaw, Samuel, and C. Gordon Fredine. 1971. *Wetlands of the United States*. Circular 39. U.S. Department of the Interior, Fish and Wildlife Service, Washington. D.C. 67 pp.
- Sloan, Charles. 1972. *Ground-water Hydrology of Prairie Potholes in North Dakota*. U.S. Department of the Interior, Geological Survey Professional Paper 585-C. U.S. Government Printing Office, Washington, D.C. 28 pp.
- Smith, Welby. 1993. *Orchids of Minnesota*. University of Minnesota Press, Minneapolis, Minnesota. 172 pp.
- Smith, Welby. 2008. *Trees and Shrubs of Minnesota*. University of Minnesota Press, Minneapolis, Minnesota. 703 pp.
- Stewart, Robert and Harold Kantrud. 1972. *Vegetation of Prairie Potholes, North Dakota, in Relation to Quality of Water and Other Environmental Factors*. U.S. Department of the Interior, Geological Survey Professional Paper 585-D. U.S. Government Printing Office, Washington, D.C. 36 pp.
- Swink, Floyd and Gerould Wilhelm. 1994. *Plants of the Chicago Region*. The Morton Arboretum, Lisle, Illinois. 921 pp.
- Tiner, Ralph. 1991. *The Concept of a Hydrophyte for Wetland Identification*. BioScience Volume 41, Number 6, 236-247.
- Tryon, Rolla. 1980. *Ferns of Minnesota*. University of Minnesota Press, Minneapolis, Minnesota. 165 pp.
- USDA Plants Database. <http://plants.usda.gov>

## BIBLIOGRAPHY

- USDA Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>
- Vance, Fenton, James Jowsey, and James McLean. 1984. *Wildflowers of the Northern Great Plains*. University of Minnesota Press, Minneapolis, Minnesota. 336 pp.
- Voss, Edward. 1972. *Michigan Flora. Part I – Gymnosperms and Monocots*. Cranbrook Institute of Science, Bloomfield Hills, Michigan and the University of Michigan Herbarium. 488 pp.
- Voss, Edward. 1985. *Michigan Flora. Part II – Dicots (Saururaceae—Cornaceae)*. Cranbrook Institute of Science, Bloomfield Hills, Michigan and the University of Michigan Herbarium. 724 pp.
- Voss, Edward. 1996. *Michigan Flora. Part III – Dicots (Pyrolaceae—Compositae)*. Cranbrook Institute of Science, Bloomfield Hills, Michigan, and the University of Michigan Herbarium. 622 pp.
- Weller, Milton. 1981. *Freshwater Marshes -- Ecology and Wildlife Management*. University of Minnesota Press, Minneapolis, Minnesota. 146 pp.
- Wisflora: Wisconsin Vascular Plant Species, University of Wisconsin Herbarium.  
<http://www.botany.wisc.edu/wisflora/>
- Wovcha, Daniel, Barbara Delany and Gerda Nordquist. 1995. *Minnesota's St. Croix River Valley and Anoka Sandplain – A Guide to Native Habitats*. University of Minnesota Press, Minneapolis, Minnesota. 234 pp.
- Wright, Herbert, Barbara Coffin and Norman Aaseng, Editors. 1992. *The Patterned Peatlands of Minnesota*. University of Minnesota Press, Minneapolis, Minnesota. 327 pp.

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