

# Coastal Plant Identification

With a focus on plants found on the wetland/upland interface in Minnesota's Lake Superior Watershed



*Viola conspersa*



*Viola adunca*

This project was funded in part under the Coastal Zone Management Act, by the National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resource Management, in conjunction with Minnesota's Lake Superior Coastal Program.



Pictures and descriptions by  
Gary B. Walton, Consulting Botanist

Course produced by:  
Minnesota Board of Water and Soil Resources  
[www.bwsr.state.mn.us](http://www.bwsr.state.mn.us)

BWSR is an equal opportunity employer  
Information in this publication is available in alternative format upon request



# TABLE OF CONTENTS FOR 2003 COASTAL PLANT IDENTIFICATION

## Introductory pages

<b>Title</b>	<b>Page Number</b>
Table of Contents by Date	i to ii
Coastal Plant Identification Course Overview by Mark Nelson	iii to iv
Minnesota List of Plants That Occur in Wetlands	v to xxxiii
Lake Superior Coastal Wetlands Final Plant List 2003	xxxiv to xlii

## Lake Superior Coastal Wetlands Web Pages

<b>Title</b>	<b>Page Number</b>
Basswood ( <i>Tilia americana</i> )	1 to 3
Pussy Willow ( <i>Salix discolor</i> ) and Prairie Willow ( <i>S. humilis</i> )	4
Maples ( <i>Acer</i> )	5 to 8
Dogwoods ( <i>Cornus</i> )	9 to 11
Some Evergreen Ferns and Fern Allies	12 to 15
Ash ( <i>Fraxinus</i> )	16
Birches ( <i>Betula</i> )	17 to 19
Shrub to Small Tree Willows ( <i>Salix</i> ) Found in Wetlands	20 to 21
Sumac ( <i>Rhus</i> )	22
Sweetfern ( <i>Comptonia</i> )	23
Smooth Rose ( <i>Rosa acicularis</i> ) and Bristly Rose ( <i>R. blanda</i> )	24
Aspens and Poplars ( <i>Populus</i> )	25 to 26
Elms ( <i>Ulmus</i> )	27
Alders ( <i>Alnus</i> ), Hazels ( <i>Corylus</i> ), and Hop Hornbeam ( <i>Ostrya</i> )	28 to 31
Blueberries ( <i>Vaccinium</i> )	32 to 33
Viburnum Family (Caprifoliaceae)	34 to 37
Large Shrubby and Small Tree Members the Rose Family (Rosaceae)	38 to 41
Plant Developments to Look For Week of April 13, 2003	42
What's Developing Week of May 1, 2003	43 to 44
What's Developing Week of May 19, 2003	45 to 49
What's Developing Week of May 25, 2003	50 to 53
What's Developing- Violets ( <i>Viola</i> ) Week of June 2, 2003	54 to 57
What's Developing- Early Season Upland Sedges Week of June 8, 2003	58 to 64

<b>Title</b>	<b>Page Number</b>
Sedge and Grass Terminology	65
<i>Antennaria</i> (Pussy-toes)	66 to 67
What's Developing- Willows ( <i>Salix</i> ) Week of July 6, 2003	68 to 74
Scouring rushes and Horsetails ( <i>Equisetum</i> )	75 to 82
Rare Plants of Northeastern Minnesota- Part 1	83 to 86
Weed of the Week- Leafy Spurge ( <i>Euphorbia esula</i> )	87
Large Sedges ( <i>Carex</i> )	88 to 89
What's Developing- Milkweeds ( <i>Asclepias</i> ) and Dogbanes ( <i>Apocynum</i> )	91 to 92
Weeds of the Week- Spotted Knapweed ( <i>Centaurea bieberstenii</i> ) and Tansy ( <i>Tanacetum vulgare</i> )	93 to 94
Grass Terminology	95 to 97
Rare Plants of Northeastern Minnesota- Part 2	98 to 99
What's Developing- Grasses (Poaceae) Part 1	99 to 101
What's Developing- Orchids	102 to 104
What's Developing- Grasses (Poaceae) Part 2	105 to 106
What's Developing- Grasses (Poaceae) Part 3	107 to 108
What's Developing- Grasses (Poaceae) Part 4	109 to 112
What's Developing- Pearly Everlasting ( <i>Anaphalis margaritacea</i> )	113
What's Developing- Grasses (Poaceae) Part 5	114 to 116
Miscellaneous Asteraceae	117 to 119
Weeds of the Week- Bull Thistle and Field Thistle	120
What's Developing- Asters Part 1	121 to 122
What's Developing- Horseweeds ( <i>Conyza</i> ) and Fleabanes ( <i>Erigeron</i> )	123
What's Developing- Goldenrods ( <i>Solidago</i> and <i>Euthamia</i> ) Part 1	124 to 126
What's Developing- Sunflowers ( <i>Helianthus</i> and <i>Heliopsis</i> )	127
Native Thistles ( <i>Cirsium</i> ) Part 1	128 to 130
What's Developing- Asters Part 2	131
What's Developing- Joe-Pye-Weed ( <i>Eupatorium</i> )	132 to 133
What's Developing- Goldenrods ( <i>Solidago</i> and <i>Euthamia</i> ) Part 2	134 to 135
What's Developing- Grasses (Poaceae) Part 6	136 to 139
Native Thistles ( <i>Cirsium</i> ) Part 2	140 to 141
What's Developing- Asters Part 3	142 to 143
What's Developing- Asters Part 4	144 to 145
What's Developing- Goldenrods ( <i>Solidago</i> and <i>Euthamia</i> ) Part 3	146
What's Developing- Water Hemlock ( <i>Cicuta</i> ) and wild Parsnips ( <i>Sium</i> and <i>Heracleum</i> )	147 to 148
What's Developing- Asters Part 5	149
What's Developing- Beggar's Ticks ( <i>Bidens</i> )	150 to 151
What's Developing- Goldenrods ( <i>Solidago</i> and <i>Euthamia</i> ) Part 4	152 to 154
What's Developing- Ranunculaceae Part 1	155 to 157
What's Developing- Raspberries and Black berries ( <i>Rubus</i> ) Part 1	158 to 159
What's Developing- Raspberries and Black berries ( <i>Rubus</i> ) Part 2	160 to 161
What's Developing- Ranunculaceae Part 2	162 to 164

<b>Title</b>	<b>Page Number</b>
What's Developing- Fern Leaves Part 1 Oak Fern and Northern Beech Fern	165 to 167
What's Developing- Fern Leaves Part 2 <i>Osmunda</i> Ferns	168
What's Developing- Fern Leaves Part 3 Ostrich Fern	169
What's Developing- Fern Leaves Part 4 Sensitive Fern	170
What's Developing- Fern Leaves Part 5 Bracken Fern	171
What's Developing- Fern Leaves Part 2 Lady's Fern and Shield-ferns	172 to 174
What's Developing- Turtlehead ( <i>Chelone</i> )	175
Index to 2003 Web Pages	176 to 180



## TABLE OF CONTENTS BY DATE

The following plants (and references) found in Minnesota's Coastal area are listed in order of placement. Dates listed (mostly) reference the approximate time of year the plant was photographed in this condition (buds, leafing out, etc.).

<b>Date</b>	<b>Plant</b>
March 18	Pussy Willow, Prairie Willow
March 18	Basswood, Bur Oak, Red Oak
March 19	Maple Key, Red Maple, Sugar Maple, Silver Maple, Box Elder Maple, Mountain Maple, Norway Maple
March 24	Leathery-leafed Grapefern, Oblique-leafed Grapefern, Ostrich Fern, Sensitive Fern, Fancy Woodfern/Toothed Woodfern, Crested Woodfern, Fan-Leaf Ground Cedar, Rough Scouring Rush
March 24	Key to Dogwoods, Pagoda Dogwood, Gray Dogwood, Red Osier Dogwood, Round-Leaved Dogwood, Bunchberry
March 25	Paper Birch, Yellow Birch, Bog Birch
March 25	Staghorn Sumac, Smooth Sumac, Sweetfern, Smooth Rose, Bristly Rose
March 25	Pussy Willow, Slender Willow, Tea-Leaf Willow, Balsam Willow, Shining Willow, Autumn Willow, Bebb's Willow, Sandbar Willow
March 25	Black Ash, Green Ash
March 27	Key to Aspen and Poplars, Cottonwood, Balsam Poplar, Quaking Aspen, Big-Tooth Aspen
March 27	American Elm
March 29	Tag Alder, Green Alder, American Hazel, Beaked Hazel, Hop Hornbeam
March 31	Velvetleaf Blueberry, Lowbush Blueberry, Labrador Tea
March 31	Key to Viburnum Family: Sheepberry, Downy Arrow-Wood, Highbush Cranberry, Waterberry, Tatarian Honeysuckle, Fly-Honeysuckle, Yellow Bush-Honeysuckle, Red Elderberry
April 9	Chokecherry, Pin-Cherry, Beach Plum, Dwarf Serviceberry, Smooth Serviceberry, Fireberry Hawthorn, Downy Hawthorn, Rowan Tree, American Mountain Ash, Apple
April 13	Quaking Aspen
May 1	Tamarack, Slender-Leaf Willow, Stalked Sedge
May 19	American Elm, Red Maple, Carex pedunculata, Wood Rush, Wild Leak, Dutchman's Breeches, Bloodroot, Marsh Marigold, Swamp Red Currant, Pin Cherry, White Spruce
May 25	Interrupted Fern, Ostrich Fern, and Lady's Fern, Marsh Horsetail, Daisy-leaf Moonwort, St. Lawrence Grape Fern, Wild Ginger, Wood Anemone, and Gold Thread
June 2	Violets: <i>Viola blanda</i> , <i>V. macloskeyi</i> , <i>V. sororia</i> , <i>V. nova-angliae</i> , <i>V. canadensis</i> , <i>V. pubescens</i> , <i>V. conspersa</i> , <i>V. adunca</i>
June 8	Sedges: <i>Carex arctata</i> , <i>C. gracillima</i> , <i>C. pennsylvanica</i> , <i>C. communis</i> , <i>C. peckii</i> , <i>C. pedunculata</i> , <i>C. deweyana</i> , <i>C. umbellata</i> , <i>C. backii</i> , <i>C. houghtoniana</i>
June 15	Sedge and Grass Terminology
June 16	Pussy-Toes
July 8	Willows: Sandbar Willow, Meadow Willow, Bebb's Willow, Pussy Willow, Diamond-Leaf Willow, Prairie Willow, Shining Willow, Autumn Willow, Balsam Willow
July 19	Equisetum: Smooth Scouring Rush, Rough Scouring Rush, Variegated Scouring Rush, Marsh Horsetail, Field Horsetail, Woodland Horsetail, Meadow Horsetail
July 21	Leafy Spurge
July 21	Plant Collecting, Rare Plants: Floating Marsh Marigold, Clustered Bur-Reed, Barren Strawberry

July 24	Common Milkweed, Swamp Milkweed, Spreading Dogbane
July 24	Lake Sedge, Beaked Sedge, Retrorse Sedge
July 25	Tansy, Spotted Knapweed
August 11	Grass Terminology with Illustrations, Alopecurus pratensis, Avena fatua, Bromus inermis
August 11	Rare Plants: Wavy Hairgrass, Pale Manna Grass
August 11	Fen Orchid, Northern Green Orchid, Early Coralroot Orchid
August 11	Smooth Brome, Kalm's Brome, Fringed Brome
August 12	Barnyard Grass, Yellow Foxtail, Green Foxtail, Foxtail Bristle Grass
August 18	Quackgrass, Slender Wheatgrass
August 18	Canary Grass, Redtop Grass, Tickle Grass, Timothy
August 19	Pearly Everlasting
August 20	Fowl Manna Grass, Rattlesnake Manna Grass, Giant Manna Grass
August 26	Yarrow, Black-eyed Susan, Ox-Eye Daisy, Orange Hawkweed, Yellow Hawkweed
August 27	Bull Thistle, Field Thistle
August 28	Northern Heart-Leaved Aster
August 28	Early Goldenrod, Gray Goldenrod
August 28	Swamp-Sunflower, Everlasting Sunflower
August 28	Horseweed, Rough Fleabane
August 29	Joe-Pye-Weed, Boneset
August 29	Wavy-Leaved Thistle, Prairie Thistle
August 29	Bristly Aster
August 29	Smooth Goldenrod, Common Goldenrod
September 7	Slender Woodreed Grass, Short-Husk Grass, Canada Bluejoint Grass, Meadow Foxtail
September 8	Swamp Thistle, Pasture Thistle
September 8	White Panicle Aster
September 9	Flat-Top White Aster
September 9	Water Parsnip, Spotted Water Hemlock, Cow Parsnip
September 9	Zig-Zag Goldenrod
September 11	Bog Goldenrod
September 11	Big-Leaf Aster
September 11	Nodding Beggar-Ticks, Devil's Beggar-Ticks
September 13	Western Thimbleberry, Dewberry
September 13	Red Raspberry, Bristly Blackberry
September 13	Grass-Leaved Goldenrod
September 13	Tall Meadowrue, Doll's Eye Baneberry, Red Baneberry
September 13	Tall Buttercup, Small Yellow Water Crowfoot, Pennsylvania Buttercup, Canada Anemone, Woodland Anemone, Round-Lobed Hepatica
September 15	Fern Terminology, Oak Fern, Northern Beech Fern
September 15	Cinnamon Fern, Interrupted Fern
September 15	Ostrich Fern
September 15	Sensitive Fern
September 15	Bracken Fern
September 15	Lady's Fern, Spinulose Fern, Crested Woodfern
September 15	Turtlehead

# **Coastal Plant Identification Course**

Overview by Mark Nelson, BWSR Duluth Office

This is a compilation of web pages prepared for a correspondence course held in 2003. The course was entitled "Coastal Plant I.D." and focused on plants found in Minnesota's Lake Superior Watershed.

Specifically, plants found near the wetland/upland border were targeted for this study. These plants are important for accurate wetland delineation.

Lead botanist for the course was Gary Walton. Gary was a consultant for the Minnesota Board of Water and Soil Resources, which organized and managed the course.

Gary also took the pictures and wrote the descriptions. They are in (mostly) chronological order. You can study the pages (plants) as you progress during the growing season in northeastern Minnesota.

Beside the web pages, field trips were held throughout the growing season in 2003 to "calibrate" our learning and to reinforce information contained in the web pages. I encourage you to continue learning by using this information and examining plants in the field.

Other plant books and keys are needed for definitive plant identification. This course provided a baseline of information about the kinds of plants found in Minnesota's coastal area.

Principal funding for this course was provided by the National Oceanic and Atmospheric Administration along with the DNR and Minnesota's Lake Superior Coastal Program.

My thanks to the course participants. They were the real reason we held this course in the first place. Around 70 wetland practitioners monitored the course on the web. In addition, around 30 people attended field trips, and some of those carried through to the final exam. (Incidentally, we do have the final exam on CD in case you ever want to challenge yourself!)

Minnesota Board of Water and Soil Resources  
394 South Lake Avenue #403  
Duluth, Minnesota 55802  
Phone: 218-723-4752  
Fax: 218-723-4794  
TTY: (800) 627-3529

December 2003

## Acknowledgements:

While I always think that acknowledgements leave people out, I'm going to try and list as many people as I can. It takes a huge effort to provide meaningful training to people. So, here goes:

### **Administrative Support**

#### BWSR Duluth Office

Mary Jo Flemming – lead support

Gene Clark – support

#### BWSR St. Paul

Mary Miller – contracting

Peter Raeker – webmaster

Doug Thomas – grant signer

### **Technical Support**

Gary Walton – Botanist

Mike Walczynski – NRCS Soils

#### BWSR Wetland Specialists

Tom Mings – St. Paul

Dale Krystosek – Bemidji

Other BWSR Technical Assistance Jim Lemmerman – Duluth Ron Shelito – Brainerd

### Special Thanks:

Oneida Realty LCS Coaches

EPA Lab, Gooseberry Falls State Park – Paul Sundberg, Split Rock State Park – Maynard Soulier, City of Duluth – Spirit Mountain and Wheeler Field, DNR Waters – Tricia Ryan, Karla Sundberg, and Erv Berglund

And especially to all those who participated in the course!

## MINNESOTA LIST OF PLANTS THAT OCCUR IN WETLANDS

(Adapted from: Reed, Porter B., Jr. 1988. National list of plant species that occur in wetlands: North Central Region (Region 3). U.S. Fish and Wildlife Service, St. Petersburg. 99p.)

{Indicator status: UPL ↔ FACU' ↔ FACU ↔ FACU' ↔ FAC' ↔ FAC ↔ FAC' ↔ FACW' ↔ FACW ↔ FACW' ↔ OBL}

Scientific Name	Species Indicator	Common Name	Family	Habit	Status
ABIES BALSAMEA	ABBA	FIR; BALSAM	PINACEAE	NT	FACW
ABUTILON THEOPHRASTI	ABTH	VELVET-LEAF	MALVACEAE	AIF	FACU-
ACALYPHA RHOMBOIDEA	ACRH	COPPER-LEAF; COMMON	EUPHORBIACEAE	ANF	FACU
ACER NEGUNDO	ACNE2	BOX-ELDER	ACERACEAE	NT	FACW-
ACER RUBRUM	ACRU	MAPLE; RED	ACERACEAE	NT	FAC
ACER SACCHARINUM	ACSA2	MAPLE; SILVER	ACERACEAE	NT	FACW
ACER SACCHARUM	ACSA3	MAPLE; SUGAR	ACERACEAE	NT	FACU
ACER SPICATUM	ACSP2	MAPLE; MOUNTAIN	ACERACEAE	NST	FACU*
ACHILLEA MILLEFOLIUM	ACMI2	YARROW; COMMON	ASTERACEAE	PNF	FACU
ACORUS CALAMUS	ACCA4	SWEETFLAG	ARACEAE	PIEF	OBL
ADIANTUM PEDATUM	ADPE	FERN; NORTHERN MAIDEN-HAIR	ADIANTACEAE	PNF3	FAC-
ADOXA MOSCHATPELLINA	ADMO	MUSK-ROOT	ADOXACEAE	PNF	FAC
AESCULUS GLABRA	AEGL	BUCKEYE; OHIO	HIPPOCASTANACEAE	NT	FAC+
AGALINIS ASPERA	AGAS2	FALSE-FOXGLOVE; ROUGH PURPLE	SCROPHULARIACEAE	ANF	FAC-
AGALINIS PAUPERCULA	AGPA12	FALSE-FOXGLOVE; SMALL-FLOWER	SCROPHULARIACEAE	ANF	OBL
AGALINIS PURPUREA	AGPU5	FALSE-FOXGLOVE; LARGE PURPLE	SCROPHULARIACEAE	ANF	FACW
AGALINIS TENUIFOLIA	AGTE3	FALSE-FOXGLOVE; SLENDER	SCROPHULARIACEAE	AF	FACW
AGASTACHE NEPETOIDES	AGNE2	GIANT-HYSSOP; YELLOW	LAMIACEAE	PNF	FACU
AGERATINA ALTISSIMA	AGAL5	SNAKEROOT; WHITE	ASTERACEAE	N	FACU
AGOSERIS GLAUCA	AGGL	FALSE-DANDELION; PALE	ASTERACEAE	PNF	FACU
AGRIMONIA GRYPOSEPALA	AGGR2	GROOVEBUR; TALL HAIRY	ROSACEAE	PNF	FACU+
AGRIMONIA ROSTELLATA	AGRO3	GROOVEBUR; BEAKED	ROSACEAE	PNF	FACU
AGRIMONIA STRIATA	AGST	GROOVEBUR; WOODLAND	ROSACEAE	PNF	FAC-
AGROHORDEUM X MACOUNII	AGMA2	WILDRYE; MACOUN	POACEAE	PNG	FAC-
AGROPYRON CANINUM	AGCA2	WHEATGRASS; CUTTING	POACEAE	PIG	FACU*
AGROPYRON REPENS	AGRE2	QUACKGRASS	POACEAE	PIG	FACU
AGROPYRON SMITHII	AGSM	WHEATGRASS; WESTERN	POACEAE	PNG	FACU+
AGROPYRON TRACHYCAULUM	AGTR	WHEATGRASS; SLENDER	POACEAE	PNG	FAC
AGROSTIS ALBA	AGAL3	REDTOP	POACEAE	PIG	FACW
AGROSTIS CANINA	AGCA4	BENTGRASS; BROWN	POACEAE	PNG	UPL
AGROSTIS GIGANTEA	AGGH2	BENTGRASS; BLACK	POACEAE	PNG	NI
AGROSTIS HYEMALIS	AGHY	BENTGRASS; WINTER	POACEAE	PNG	FAC-
AGROSTIS PERENNANS	AGPE	BENTGRASS; PERENNIAL	POACEAE	PNG	FAC-
AGROSTIS SCABRA	AGSC5	BENTGRASS; ROUGH	POACEAE	PNG	FAC
AGROSTIS STOLONIFERA	AGST2	BENTGRASS; SPREADING	POACEAE	PNG	FACW
ALETIS FARINOSA	ALFA2	COLIC-ROOT; WHITE	LILIACEAE	PNF	FAC
ALISMA GRAMINEUM	ALGR	WATER-PLANTAIN; NARROW-LEAF	ALISMACEAE	PNEF	OBL
ALISMA PLANTAGO-AQUATICA	ALPL	WATER-PLANTAIN; BROAD-LEAF	ALISMACEAE	PNEF	OBL
ALISMA SUBCORDATUM	ALSU	WATER-PLANTAIN; SUBCORDATE	ALISMACEAE	PNEF	OBL
ALLIARIA PETIOLATA	ALPE4	MUSTARD; GARLIC	BRASSICACEAE	BIF	FAC
ALLIUM CANADENSE	ALCA3	ONION; MEADOW	LILIACEAE	PNF	FACU
ALLIUM SCHOENOPRASUM	ALSC	CHIVES	LILIACEAE	PNF	FAC+
ALLIUM TRICOCCUM	ALTR	LEEK; SMALL WHITE	LILIACEAE	PNF	FACU+
ALNUS CRISPA	ALCR6	ALDER; GREEN	BETULACEAE	NS	FAC

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU' ↔ FAC' ↔ FAC' ↔ FAC' ↔ FACW ↔ FACW ↔ FACW' ↔ OBL}

Species					
Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
ALNUS GLUTINOSA	ALGL2	ALDER; EUROPEAN	BETULACEAE	IT	FACW-
ALNUS INCANA	ALIN2	ALDER; SPECKLED	BETULACEAE	NS	FACU
ALNUS RUGOSA	ALRU3	ALDER; SPECKLED	BETULACEAE	NT	OBL
ALOPECURUS AEQUALIS	ALAE	FOXTAIL; SHORT-AWN	POACEAE	PNG	OBL
ALOPECURUS CAROLINIANUS	ALCA4	FOXTAIL; TUFTED	POACEAE	ANG	FACW
ALOPECURUS GENICULATUS	ALGE2	FOXTAIL; MEADOW	POACEAE	PNG	OBL
ALOPECURUS PRATENSIS	ALPR3	FOXTAIL; MEADOW	POACEAE	PIG	FACW
AMARANTHUS ALBUS	AMAL	AMARANTH; WHITE	AMARANTHACEAE	ANF	FACU
AMARANTHUS RETROFLEXUS	AMRE	AMARANTH; RED-ROOT	AMARANTHACEAE	ANF	FACU+
AMARANTHUS RUDIS	AMRU	AMARANTH; TALL	AMARANTHACEAE	ANF	FACW
AMARANTHUS SPINOSUS	AMSP	AMARANTH; SPINY	AMARANTHACEAE	ANF	FACU
AMARANTHUS TUBERCOLATUS	AMTU	AMARANTH; ROUGH-FRUIT	AMARANTHACEAE	ANF	OBL
AMBROSIA ARTEMISIIFOLIA	AMAR2	RAGWEED; ANNUAL	ASTERACEAE	ANF	FACU
AMBROSIA PSILOSTACHYA	AMPS	RAGWEED; NAKED-SPIKE	ASTERACEAE	PNF	FAC-
AMBROSIA TRIFIDA	AMTR	RAGWEED; GREAT	ASTERACEAE	ANF	FAC+
AMELANCHIER ALNIFOLIA	AMAL2	SERVICE-BERRY; SASKATOON	ROSACEAE	NS	FACU+
AMELANCHIER ARBOREA	AMAR3	SERVICE-BERRY; DOWNY	ROSACEAE	NT	FACU
AMELANCHIER BARTRAMIANA	AMBA	SERVICE-BERRY; BARTRAM'S	ROSACEAE	NS	FAC
AMELANCHIER CANADENSIS	AMCA4	SERVICE-BERRY; OBLONG-LEAF	ROSACEAE	NS	FACU
AMELANCHIER SPICATA	AMSP2	JUNE-BERRY; LOW	ROSACEAE	NS	FACU
AMELANCHIER X INTERMEDIA	AMIN4	SHADBUSH; SWAMP	ROSACEAE	NS	FACW
AMERORCHIS ROTUNDIFOLIA	AMRO	ORCHID; ROUND-LEAF	ORCHIDACEAE	PNF	OBL
AMMANNIA COCCINEA	AMCO	AMMANNIA; PURPLE	LYTHRACEAE	ANF	OBL
AMMOPHILA BREVLIGULATA	AMBR	BEACHGRASS; AMERICAN	POACEAE	PNG	UPL*
AMORPHA FRUTICOSA	AMFR	INDIGO-BUSH; FALSE	FABACEAE	NS	FACW+
AMORPHA NANA	AMNA	INDIGO-BUSH; FRAGRANT	FABACEAE	NS	NI
AMPHICARPAEA BRACTEATA	AMBR2	HOG-PEANUT; AMERICAN	FABACEAE	APNFV	FAC
AMSONIA TABERNAEMONTANA	AMTA2	SLIMPOD; EASTERN	APOCYNACEAE	PNF	FACW
ANAGALLIS ARVENSIS	ANAR	PIMPERNEL; SCARLET	PRIMULACEAE	AIF	NI
ANDROMEDA GLAUCOPHYLLA	ANGL	ROSEMARY; DOWNY BOG	ERICACEAE	NS	OBL
ANDROMEDA POLIFOLIA	ANPO	ROSEMARY; BOG	ERICACEAE	NS	OBL
ANDROPOGON GERARDII	ANGE	BLUESTEM; BIG	POACEAE	PNG	FAC-
ANDROPOGON VIRGINICUS	ANVI2	BROOM-SEDGE	POACEAE	PNG	FAC-
ANDROSACE OCCIDENTALIS	ANOC2	ROCK-JASMINE; WESTERN	PRIMULACEAE	ANF	FACU-
ANDROSACE SEPTENTRIONALIS	ANSE4	ROCK-JASMINE; PYGMY-FLOWER	PRIMULACEAE	ANF	FAC-
ANEMONE CANADENSIS	ANCA8	THIMBLE-WEED; CANADA	RANUNCULACEAE	PNF	FACW
ANEMONE PARVIFLORA	ANPA	THIMBLE-WEED; SMALL-FLOWER	RANUNCULACEAE	PNF	NI
ANEMONE QUINQUEFOLIA	ANQU	THIMBLE-WEED; AMERICAN WOODLAND	RANUNCULACEAE	PNF	FACW
	FAC*				NI
ANEMONE RIPARIA	ANRI2	THIMBLE-WEED; RIVER	RANUNCULACEAE	PNF	NI
ANEMONE VIRGINIANA	ANVI3	THIMBLE-WEED; TALL	RANUNCULACEAE	PNF	NI
ANGELICA ATROPURPUREA	ANAT	ANGELICA; PURPLE-STEM	APIACEAE	PNF	OBL
ANTHEMIS COTULA	ANCO2	MAYWEED	ASTERACEAE	AIF	FACU
ANTHOXANTHUM ODORATUM	ANOD	GRASS; SWEET VERNAL	POACEAE	PIG	FACU
APIOS AMERICANA	APAM	POTATO-BEAN; AMERICAN	FABACEAE	PNF	FACW
APLECTRUM HYEMALE	APHY	PUTTYROOT	ORCHIDACEAE	PNF	FAC-
APOCYNUM CANNABINUM	APCA	DOGBANE; CLASPING-LEAF	APOCYNACEAE	PNF	FAC
APOCYNUM SIBIRICUM	APSI	DOGBANE; PRAIRIE	APOCYNACEAE	PNF	FAC+

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU' ↔ FAC' ↔ FAC' ↔ FACW ↔ FACW' ↔ OBL}

Species					
Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
AQUILEGIA CANADENSIS	AQCA	COLUMBINE; WILD	RANUNCULACEAE	PNF	FAC-
ARABIS DIVARICARPA	ARDI2	ROCKCRESS; LIMESTONE	BRASSICACEAE	BNF	FACU
ARABIS DRUMMONDII	ARDR	ROCKCRESS; DRUMMOND'S	BRASSICACEAE	BNF	FACU
ARABIS HIRSUTA	ARHI	ROCKCRESS; HAIRY	BRASSICACEAE	PNF	FACU
ARABIS HOLBOELLII	ARHO2	ROCKCRESS; HOLBOELL'S	BRASSICACEAE	BNF	UPL
ARABIS LYRATA	ARLY2	ROCKCRESS; LYRE-LEAF	BRASSICACEAE	BNF	FACU-
ARALIA NUDICAULIS	ARNU2	SARSAPARILLA; WILD	ARALIACEAE	PNF	FACU
ARCTOSTAPHYLOS UVA-URSI	ARUV	BEARBERRY	ERICACEAE	NS	UPL
ARENARIA SERPYLLIFOLIA	ARSE2	SANDWORT; THYME-LEAF	CARYOPHYLLACEAE	AIF	FAC
ARETHUSA BULBOSA	ARBU	SWAMP-PINK	ORCHIDACEAE	PNF	OBL
ARISAEMA DRACONTIUM	ARDR3	DRAGON; GREEN	ARACEAE	PNF	FACW
ARISAEMA TRIPHYLLUM	ARTR	JACK-IN-THE-PULPIT; SWAMP	ARACEAE	PNF	FACW-
ARISTIDA DICHOTOMA	ARDI4	GRASS; SHINNERS' THREE-AWN	POACEAE	ANG	FACU
ARISTIDA LONGESPICA	ARLO2	GRASS; SLIM-SPIKE THREE-AWN	POACEAE	ANG	FACU-
ARMORACIA AQUATICA	ARAQ	LAKECRESS	BRASSICACEAE	PNZF	OBL
ARMORACIA RUSTICANA	ARRU4	HORSERADISH	BRASSICACEAE	PIEF	FAC*
ARNICA CHAMISSONIS	ARCH3	ARNICA; LEAFY	ASTERACEAE	PNF	NI
ARNOGLOSSUM PLANTAGINEUM	ARPL4	INDIAN-PLANTAIN; GROOVE-STEM	ASTERACEAE	PNF	FAC
ARONIA MELANOCARPA	ARME6	CHOKEBERRY; BLACK	ROSACEAE	NS	FACW-
ARRHENATHERUM ELATIUS	AREL3	OATGRASS; TALL	POACEAE	PIG	FACU
ARTEMISIA BIENNIS	ARBI2	WORMWOOD; BIENNIAL	ASTERACEAE	AIF	FACW-
ARTEMISIA CANA	ARCA13	SAGEBRUSH; SILVER	ASTERACEAE	NS	FACU
ARTEMISIA LUDOVICIANA	ARLU	SAGEBRUSH; WHITE	ASTERACEAE	PNFH	UPL
ARTEMISIA STELLERANA	ARST6	SAGEBRUSH; HOARY	ASTERACEAE	PIF	FACU-
ASCLEPIAS EXALTATA	ASEX	MILKWEED; POKE	ASCLEPIADACEAE	PNF	NI
ASCLEPIAS HIRTELLA	ASHI	MILKWEED; GREEN	ASCLEPIADACEAE	PNF	UPL
ASCLEPIAS INCARNATA	ASIN	MILKWEED; SWAMP	ASCLEPIADACEAE	PNF	OBL
ASCLEPIAS PURPURASCENS	ASPU2	MILKWEED; PURPLE	ASCLEPIADACEAE	PNF	FACU
ASCLEPIAS SPECIOSA	ASSP	MILKWEED; SHOWY	ASCLEPIADACEAE	PNF	FAC
ASPARAGUS OFFICINALIS	ASOF	ASPARAGUS-FERN; GARDEN	LILIACEAE	PIF	FACU
ASPLENIUM PLATYNEURON	ASPL	SPLEENWORT; EBONY	ASPLENIACEAE	PNF3	FACU
ASTER BRACHYACTIS	ASBR3	ASTER; RAYLESS ALKALI	ASTERACEAE	ANF	FAC
ASTER ERICOIDES	ASER3	ASTER; WHITE HEATH	ASTERACEAE	PNF	FACU-
ASTER FALCATUS	ASFA2	ASTER; WHITE PRAIRIE	ASTERACEAE	PNF	FAC-
ASTER HESPERIUS	ASHF	ASTER; SISKIYOU	ASTERACEAE	PNF	OBL
ASTER JUNCIFORMIS	ASJU	ASTER; RUSH	ASTERACEAE	PNF	OBL
ASTER LATERIFLORUS	ASLA6	ASTER; CALICO	ASTERACEAE	PNF	FACW-
ASTER LUCIDULUS	ASLU	ASTER; SHINING	ASTERACEAE	PNF	FACW+
ASTER MODESTUS	ASMO3	ASTER; GREAT NORTHERN	ASTERACEAE	PNF	FAC+
ASTER NOVAE-ANGLIAE	ASNO	ASTER; NEW ENGLAND	ASTERACEAE	PNF	FACW
ASTER ONTARIONIS	ASON	ASTER; ONTARIO	ASTERACEAE	PNF	FAC
ASTER PILOSUS	ASPI2	ASTER; WHITE HEATH	ASTERACEAE	PNF	FACU+
ASTER PRAEALTUS	ASPR2	ASTER; WILLOW-LEAF	ASTERACEAE	PNF	FACW
ASTER PRENANTHOIDES	ASPR4	ASTER; CROOKED-STEM	ASTERACEAE	PNF	FAC
ASTER PUNICEUS	ASPU5	ASTER; SWAMP	ASTERACEAE	PNF	OBL
ASTER SIMPLEX	ASSI2	ASTER; PANICLED	ASTERACEAE	PNF	FACW
ASTER TRADESCANTI	ASTR3	ASTER; TRADESCANT	ASTERACEAE	PNF	FACW
ASTER UMBELLATUS	ASUM	ASTER; FLAT-TOP WHITE	ASTERACEAE	PNF	FACW
ASTER X LANCEOLATUS	ASLA?	ASTER; WHITE PANICLE	ASTERACEAE	F	NI
ASTRAGALUS AGRESTIS	ASAG2	MILKVETCH; FIELD	FABACEAE	PNF	FACW-
ASTRAGALUS CANADENSIS	ASCA11	MILKVETCH; CANADA	FABACEAE	PNF	FAC+
ASTRAGALUS NEGLECTUS	ASNE2	MILKVETCH; COOPER'S	FABACEAE	PNF	FACU-

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU'' ↔ FAC' ↔ FAC'' ↔ FACW ↔ FACW' ↔ FACW'' ↔ OBL}

Species Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
ATHYRIUM FILIX-FEMINA	ATF1	FERN; SUBARCTIC LADY	ASPLENIACEAE	PNF3	FAC
ATHYRIUM PYCNOCARPON	ATPY	FERN; NARROW-LEAF LADY	ASPLENIACEAE	PNF3	FAC-
ATHYRIUM THELYPTEROIDES	ATTH	FERN; SILVERY LADY	ASPLENIACEAE	PNF3	FAC
ATRIPLEX ARGENTEA	ATAR2	SALTBUSH; SILVER-SCALE	CHENOPODIACEAE	ANF	FAC
ATRIPLEX HORTENSIS	ATHO	ORACHE; GARDEN	CHENOPODIACEAE	AIF	FAC
ATRIPLEX PATULA	ATPA4	SALTBUSH; HALBERD-LEAF	CHENOPODIACEAE	ANF	FACW-
AZOLLA MEXICANA	AZME	FERN; MEXICAN MOSQUITO	AZOLLACEAE	PN/W	OBL
BACOPA ROTUNDIFOLIA	BARO	WATER-HYSSOP; DISK	SCROPHULARIACEAE	PNF	OBL
BAPTISIA LACTEA	BALA2	WILD-INDIGO; WHITE	FABACEAE	PNF	FACU*
BARBAREA ORTHOCERAS	BAOR	WINTER-CRESS; AMERICAN	BRASSICACEAE	BNEF	OBL
BARBAREA VULGARIS	BAVU	ROCKET; YELLOW	BRASSICACEAE	BIF	FAC
BARTONIA VIRGINICA	BAV13	SCREWSTEM; YELLOW	GENTIANACEAE	ANF	FACW+
BECKMANNIA ERUCIFORMIS	BEER2	GRASS; BECKMANN'S	POACEAE	G	OBL
BECKMANNIA SYZIGACHNE	BESY	SLOUGHGRASS; AMERICAN	POACEAE	ANG	OBL
BERBERIS THUNBERGII	BETH	BARBERRY; JAPANESE	BERBERIDACEAE	IS	FACU-
BERBERIS VULGARIS	BEVU	BARBERRY; EUROPEAN	BERBERIDACEAE	IS	FACU
BERULA ERECTA	BEER	PARSNIP; CUT-LEAF WATER	APIACEAE	PIF	OBL
BETULA ALLEGHANIENSIS	BEAL2	BIRCH; YELLOW	BETULACEAE	NT	FAC
BETULA NIGRA	BENI	BIRCH; RIVER	BETULACEAE	NT	FACW
BETULA PAPHYRIFERA	BEPA	BIRCH; PAPER	BETULACEAE	NT	FACU+
BETULA PUMILA	BEPU4	BIRCH; BOG	BETULACEAE	NS	OBL
BETULA X PURPUSII	BEPU3	BIRCH; PURPUS'	BETULACEAE	NT	OBL
BETULA X SANDBERGII	BESA	BIRCH; SANDBERG'S	BETULACEAE	NT	OBL
BIDENS ARISTOSA	BIAR	BEGGAR-TICKS; BEARDED	ASTERACEAE	ANF	FACW
BIDENS CERNUA	BICE	BEGGAR-TICKS; NODDING	ASTERACEAE	AIF	OBL
BIDENS COMOSA	BICO3	BEGGAR-TICKS; LEAFY-BRACT	ASTERACEAE	ANF	FACW
BIDENS CONNATA	BICO5	BEGGAR-TICKS; PURPLE-STEM	ASTERACEAE	ANF	OBL
BIDENS CORONATA	BICO	BEGGAR-TICKS; LARGE-FRUIT	ASTERACEAE	ANF	OBL
BIDENS DISCOIDEA	BIDI	BEGGAR-TICKS; SWAMP	ASTERACEAE	ANF	FACW
BIDENS FRONDOSA	BIFR	BEGGAR-TICKS; DEVIL'S	ASTERACEAE	ANF	FACW
BIDENS TRIPARTITA	BITR	BEGGAR-TICKS; THREE-LOBE	ASTERACEAE	AIF	OBL
BLEPHILIA HIRSUTA	BLHI	WOODMINT; HAIRY	LAMIACEAE	PNF	FACU-*
BOEHMERIA CYLINDRICA	BOCY	FALSE-NETTLE; SMALL-SPIKE	URTICACEAE	PNF	OBL
BOLTONIA ASTEROIDES	BOAS	BOLTONIA; WHITE	ASTERACEAE	PNF	FACW
BOTRYCHIUM DISSECTUM	BOD12	GRAPEFERN; CUTLEAF	OPHIOGLOSSACEAE	PNF3	FAC
BOTRYCHIUM LANCEOLATUM	BOLA	MOONWORT; TRIANGLE	OPHIOGLOSSACEAE	PNF3	FACW
BOTRYCHIUM LUNARIA	ROLU	MOONWORT	OPHIOGLOSSACEAE	PNF3	FACW
BOTRYCHIUM MATRICARIIFOLIUM	BOA2	MOONWORT; DAISY-LEAF	OPHIOGLOSSACEAE	PNF3	FACU
BOTRYCHIUM MULTIFIDUM	BOMU	GRAPEFERN; LEATHERY	OPHIOGLOSSACEAE	PNF3	FACU
BOTRYCHIUM SIMPLEX	BOSI	GRAPEFERN; LEAST	OPHIOGLOSSACEAE	PNF3	FAC
BOTRYCHIUM VIRGINIANUM	BOVI	FERN; RATTLESNAKE	OPHIOGLOSSACEAE	PNF3	FACU
BRASENIA SCHREBERI	BRSC	WATERSHIELD	NYMPHAEACEAE	PNZF	OBL
BROMUS CILIATUS	BRC12	BROME; FRINGED	POACEAE	PNG	FACW
BROMUS JAPONICUS	BRJA	BROME; JAPANESE	POACEAE	AIG	FACU
BROMUS KALMII	BRKA2	BROME; KALM'S	POACEAE	PNG	FAC
BROMUS LATIGLUMIS	BRLA4	BROME; EARLEAF	POACEAE	PNG	FACW-
BROMUS PURGANS	BRPU4	BROME; CANADA	POACEAE	PNG	FACU+
BUCHLOE DACTYLOIDES	BUDA	GRASS; BUFFALO	POACEAE	PNG	FACU-
BULBOSTYLIS CAPILLARIS	BUCA2	HAIRSEEDGE; DENSE-TUFT	CYPERACEAE	APNGL	FACU+
CALAMAGROSTIS CANADENSIS	CACA4	REEDGRASS; BLUE-JOINT	POACEAE	PNG	OBL

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU' ↔ FAC' ↔ FAC' ↔ FAC' ↔ FACW ↔ FACW' ↔ FACW' ↔ OBL}

Species					
Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
CALAMAGROSTIS INEXPANSA	CAIN	SMALL-REEDGRASS; NARROW-SPIKE	POACEAE	PNG	FACW+
CALAMAGROSTIS NEGLECTA	CANE	REEDGRASS; SLIMSTEM	POACEAE	PNG	FACW+
CALAMAGROSTIS PERPLEXA	CAPE10	REEDGRASS; POND	POACEAE	PNG	FACW
CALLA PALUSTRIS	CAPA	CALLA; WILD	ARACEAE	PNEF	OBL
CALLITRICH HERMAPHRODITICA	CAHE2	WATER-STARWORT; AUTUMNAL	CALLITRICHACEAE	PNZF	OBL
CALLITRICH HETEROPHYLLA	CAHE3	WATER-STARWORT; LARGER	CALLITRICHACEAE	PIZ/F	OBL
CALLITRICH VERNA	CAVE2	WATER-STARWORT; SPINY	CALLITRICHACEAE	PNZ/F	OBL
CALOPOGON TUBEROSUS	CATU5	GRASS-PINK; TUBEROUS	ORCHIDACEAE	PNF	OBL
CALTHA NATANS	CANA	MARSH-MARIGOLD; FLOATING	RANUNCULACEAE	PNZF	OBL
CALTHA PALUSTRIS	CAPA5	MARSH-MARIGOLD; COMMON	RANUNCULACEAE	PNF	OBL
CALYPSO BULBOSA	CABU	SLIPPER; FAIRY	ORCHIDACEAE	PNF	FACW
CALYSTEGIA SEPIUM	CASE13	BINDWEED; HEDGE	CONVOLVULACEAE	PIF	FAC
CAMELINA SATIVA	CASA2	FALSE-FLAX; LARGE-SEED	BRASSICACEAE	AIF	FAC-
CAMPANULA AMERICANA	CAAM6	BELLFLOWER; AMERICAN	CAMPANULACEAE	ANF	FAC
CAMPANULA APARINOIDES	CAAP2	BELLFLOWER; MARSH	CAMPANULACEAE	PNF	OBL
CAMPANULA ROTUNDIFOLIA	CARO2	BELLFLOWER; SCOTCH	CAMPANULACEAE	PNF	FAC-
CANNABIS SATIVA	CASA3	MARIJUANA	MORACEAE	AIF	FAC
CAPSELLA BURSA-PASTORIS	CABU2	PURSE; COMMON SHEPHERD'S	BRASSICACEAE	AIF	FAC-
CARDAMINE BULBOSA	CABU3	BITTER-CRESS; BULBOUS	BRASSICACEAE	PNF	OBL
CARDAMINE CONCATENATA	CACO26	TOOTHWORT; CUT-LEAF	BRASSICACEAE	PNF	FACU
CARDAMINE DIPHYLLO	CADI10	TOOTHWORT; TWO-LEAF	BRASSICACEAE	PNF	FAC*
CARDAMINE PARVIFLORA	CAPA12	BITTER-CRESS; SMALL-FLOWER	BRASSICACEAE	AIF	FAC
CARDAMINE PENNSYLVANICA	CAPE3	BITTER-CRESS; PENNSYLVANIA	BRASSICACEAE	ANF	FACW+
CARDAMINE PRATENSIS	CAPR3	BITTER-CRESS; MEADOW	BRASSICACEAE	PNF	OBL
CAREX AENAE	CAAE	SEDGE; BRONZE	CYPERACEAE	PNGL	NI
CAREX ALOPECOIDEA	CAAL8	SEDGE; FOXTAIL	CYPERACEAE	PNGL	FACW+
CAREX AMPHIBOLA	CAAM8	SEDGE; NARROW-LEAF	CYPERACEAE	PNGL	FAC+
CAREX ANNECTENS	CAAN6	SEDGE; YELLOW-FRUIT	CYPERACEAE	PNGL	FACW
CAREX AQUATILIS	CAAQ	SEDGE; WATER	CYPERACEAE	PNEGL	OBL
CAREX ARCTA	CAAR2	SEDGE; NORTHERN CLUSTERED	CYPERACEAE	PNGL	OBL
CAREX ATHERODES	CAAT2	SEDGE; SLOUGH	CYPERACEAE	PNEGL	OBL
CAREX AUREA	CAAU3	SEDGE; GOLDEN-FRUIT	CYPERACEAE	PNGL	FACW+
CAREX BEBBII	CABE2	SEDGE; BEBB'S	CYPERACEAE	PNGL	OBL
CAREX BICKNELLII	CAB13	SEDGE; BICKNELL'S	CYPERACEAE	PNGL	FAC-
CAREX BLANDA	CABL	SEDGE; WOODLAND	CYPERACEAE	PNGL	FAC
CAREX BREVIOR	CABR10	SEDGE; SHORT-BEAK	CYPERACEAE	PNEGL	FAC
CAREX BRUNNESCENS	CABR15	SEDGE; BROWNISH	CYPERACEAE	PNGL	FACW
CAREX BUXBAUMII	CABU6	SEDGE; BROWN BOG	CYPERACEAE	PNEGL	OBL
CAREX CANESCENS	CACA11	SEDGE; HOARY	CYPERACEAE	PNGL	OBL
CAREX CAPILLARIS	CACA12	SEDGE; HAIR-LIKE	CYPERACEAE	PNGL	FACW
CAREX CASTANEA	CACA16	SEDGE; CHESTNUT-COLOR	CYPERACEAE	PNEGH.	FACW+
CAREX CEPHALOIDEA	CACE2	SEDGE; THIN-LEAF	CYPERACEAE	GL	FACU+
CAREX CEPHALOPHORA	CACE	SEDGE; OVAL-LEAF	CYPERACEAE	PNGL	FACU
CAREX CHORDORRHIZA	CACH5	SEDGE; CREEPING	CYPERACEAE	PNGL	OBL
CAREX COMOSA	CAC08	SEDGE; BEARDED	CYPERACEAE	PNEGL	OBL
CAREX CONJUNCTA	CACO13	SEDGE; SOFT FOX	CYPERACEAE	PNGL	FACW
CAREX CONOIDEA	CACO14	SEDGE; FIELD	CYPERACEAE	PNGL	FACW+
CAREX CRAWEI	CACR3	SEDGE; CRAWE'S	CYPERACEAE	PNGL	FACW
CAREX CRAWFORDII	CACR4	SEDGE; CRAWFORD'S	CYPERACEAE	PNGL	FAC+
CAREX CRINITA	CACR6	SEDGE; FRINGED	CYPERACEAE	PNEGL	FACW+
CAREX CRISTATELLA	CACR7	SEDGE; CRESTED	CYPERACEAE	PNGL	FACW+
CAREX CRUS-CORVI	CACR8	SEDGE; RAVEN-FOOT	CYPERACEAE	PNGL	OBL
CAREX CRYPTOLEPIS	CACR9	SEDGE; NORTHEASTERN	CYPERACEAE	PNGL	OBL
CAREX DAVISII	CADA	SEDGE; DAVIS'	CYPERACEAE	PNGL	FAC+
CAREX DEBILIS	CADE5	SEDGE; WHITE-EDGE	CYPERACEAE	PNGL	FACW
CAREX DEWEYANA	CADE9	SEDGE; SHORT-SCALE	CYPERACEAE	PNGL	FACU-
CAREX DIANDRA	CADI4	SEDGE; LESSER PANICLED	CYPERACEAE	PNGL	OBL
CAREX DISPERMA	CADI6	SEDGE; SOFT-LEAF	CYPERACEAE	PNGL	OBL
CAREX EBURNEA	CAEB2	SEDGE; BRISTLE-LEAF	CYPERACEAE	PNGL	FACU-

{Indicator status: UPL ↔ FACU' ↔ FACU ↔ FACU' ↔ FAC' ↔ FAC ↔ FAC' ↔ FACW ↔ FACW' ↔ FACW' ↔ OBL}

Species  
Indicator

<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
CAREX ECHINATA	CAEC	SEDGE; LITTLE PRICKLY	CYPERACEAE	PNGL	OBL
CAREX EMORYI	CAEM2	SEDGE; EMORY'S	CYPERACEAE	PNGL	OBL
CAREX EXILIS	CAEX7	SEDGE; COAST	CYPERACEAE	PNGL	OBL
CAREX FESTUCACEA	CAFE3	SEDGE; FESCUE	CYPERACEAE	PNGL	FAC
CAREX FLAVA	CAFL4	SEDGE; YELLOW	CYPERACEAE	PNGL	OBL
CAREX FOENEA	CAFO3	SEDGE; DRY-SPIKE	CYPERACEAE	PNGL	NI
CAREX FORMOSA	CAFO4	SEDGE; HANDSOME	CYPERACEAE	PNGL	FACW-
CAREX GRACILLIMA	CAGR2	SEDGE; GRACEFUL	CYPERACEAE	PNGL	FACU*
CAREX GRANULARIS	CAGR3	SEDGE; MEADOW	CYPERACEAE	PNGL	FACW+
CAREX GRAYI	CAGR5	SEDGE; ASA GRAY'S	CYPERACEAE	PNGL	FACW+
CAREX GYNOCRATES	CAGY2	SEDGE; NORTHERN BOG	CYPERACEAE	PNGL	OBL
CAREX HALLII	CAHA3	SEDGE; DEER	CYPERACEAE	PNGL	NI
CAREX HAYDENII	CAHA7	SEDGE; CLOUD	CYPERACEAE	PNEGL	OBL
CAREX HYSTERICINA	CAHY4	SEDGE; PORCUPINE	CYPERACEAE	PNEGL	OBL
CAREX INTERIOR	CAIN1	SEDGE; INLAND	CYPERACEAE	PNGL	OBL
CAREX INTUMESCENS	CAIN2	SEDGE; BLADDER	CYPERACEAE	PNGL	FACW+
CAREX LACUSTRIS	CALA1	SEDGE; LAKEBANK	CYPERACEAE	PNEGL	OBL
CAREX LAEVICONICA	CALA12	SEDGE; SMOOTH-CONE	CYPERACEAE	PNEGL	OBL
CAREX LAEVIVAGINATA	CALA14	SEDGE; SMOOTH-SHEATH	CYPERACEAE	PNGL	OBL
CAREX LANUGINOSA	CALA30	SEDGE; WOOLY	CYPERACEAE	PNGL	OBL
CAREX LASIOCARPA	CALA16	SEDGE; WOOLLY-FRUIT	CYPERACEAE	PNEGL	OBL
CAREX LAXIFLORA	CALA19	SEDGE; LOOSE-FLOWERED	CYPERACEAE	PNGL	UPL*
CAREX LENTICULARIS	CALE8	SEDGE; SHORE	CYPERACEAE	PNGL	OBL
CAREX LEPTALEA	CALE10	SEDGE; BRISTLY-STALK	CYPERACEAE	PNGL	OBL
CAREX LEPTONERVIA	CALE11	SEDGE; NERVELESS WOOD	CYPERACEAE	PNGL	FAC
CAREX LIMOSA	CAL17	SEDGE; MUD	CYPERACEAE	PNGL	OBL
CAREX LIVIDA	CALI	SEDGE; LIVID	CYPERACEAE	PNGL	OBL
CAREX LUPULIFORMIS	CALU3	SEDGE; FALSE HOP	CYPERACEAE	PNGL	FACW+
CAREX LUPULINA	CALU4	SEDGE; HOP	CYPERACEAE	PNEGL	OBL
CAREX LURIDA	CALU5	SEDGE; SHALLOW	CYPERACEAE	PNEGL	OBL
CAREX MEADII	CAME2	SEDGE; MEAD'S	CYPERACEAE	PNGL	FAC
CAREX MEDIA	CAME9	SEDGE; INTERMEDIATE	CYPERACEAE	PNGL	FACW
CAREX MICHAUXIANA	CAMI15	SEDGE; MICHAUX'S	CYPERACEAE	PNGL	OBL
CAREX MICROGLOCHIN	CAMI6	SEDGE; FALSE UNICINIA	CYPERACEAE	PNGL	NI
CAREX MUSKINGUMENSIS	CAMU9	SEDGE; MUSKINGUM	CYPERACEAE	PNGL	OBL
CAREX NORMALIS	CANO	SEDGE; LARGER STRAW	CYPERACEAE	PNGL	FACW
CAREX NORVEGICA	CANO2	SEDGE; SCANDINAVIAN	CYPERACEAE	PNGL	FACW
CAREX OLIGOSPERMA	CAOL3	SEDGE; FEW-SEED	CYPERACEAE	PNGL	OBL
CAREX PAUCIFLORA	CAPA19	SEDGE; FEW-FLOWER	CYPERACEAE	PNGL	OBL
CAREX PAUPERCULA	CAPA22	SEDGE; POOR	CYPERACEAE	PNEGL	OBL
CAREX PRAEGRACILIS	CAPR5	SEDGE; CLUSTERED FIELD	CYPERACEAE	PNGL	FACW
CAREX PRAIREA	CAPR6	SEDGE; PRAIRIE	CYPERACEAE	PNGL	FACW+
CAREX PRATICOLA	CAPR7	SEDGE; NORTHERN MEADOW	CYPERACEAE	PNGL	FAC
CAREX PROJECTA	CAPR9	SEDGE; NECKLACE	CYPERACEAE	PNGL	FACW+
CAREX PSEUDOCYPERUS	CAPS	SEDGE; CYPRESS-LIKE	CYPERACEAE	PNEGL	OBL
CAREX RETRORSA	CARE4	SEDGE; RETRORSE	CYPERACEAE	PNGL	OBL
CAREX RICHARDSONII	CARI	SEDGE; RICHARDSON'S	CYPERACEAE	PNGL	UPL
CAREX ROSTRATA	CAR06	SEDGE; BEAKED	CYPERACEAE	PNEGL	OBL
CAREX SARTWELLII	CASA8	SEDGE; SARTWELL'S	CYPERACEAE	PNGL	FACW+
CAREX SCOPARIA	CASC11	SEDGE; POINTED BROOM	CYPERACEAE	PNGL	FACW
CAREX SPARGANIOIDES	CASP3	SEDGE; BUR-REED	CYPERACEAE	PNGL	FAC
CAREX SPRENGELII	CASP7	SEDGE; LONG-BEAK	CYPERACEAE	PNGL	FAC
CAREX SQUARROSA	CASQ2	SEDGE; SQUARROSE	CYPERACEAE	PNGL	OBL
CAREX STERILIS	CAST16	SEDGE; DIOECIOUS	CYPERACEAE	PNGL	OBL
CAREX STRICTA	CAST8	SEDGE; UPTIGHT	CYPERACEAE	PNEGL	OBL
CAREX SUBRECTA	CASU5	SEDGE; PRAIRIE STRAW	CYPERACEAE	PNGL	OBL
CAREX SYCHNOCEPHALA	CASY	SEDGE; MANY-HEAD	CYPERACEAE	PNGL	FACW+
CAREX TENERA	CATE3	SEDGE; SLENDER	CYPERACEAE	PNGL	FAC+
CAREX TENUIFLORA	CATE5	SEDGE; SPARSE-FLOWER	CYPERACEAE	PNGL	OBL
CAREX TETANICA	CATE6	SEDGE; RIGID	CYPERACEAE	PNGL	FACW
CAREX TORREYI	CAT03	SEDGE; TORREY'S	CYPERACEAE	PNGL	NI
CAREX TORTA	CAT04	SEDGE; TWISTED	CYPERACEAE	PNGL	OBL
CAREX TRIBULOIDES	CATR7	SEDGE; BLUNT BROOM	CYPERACEAE	PNGL	FACW+
CAREX TRICHOCARPA	CATR8	SEDGE; HAIRY-FRUIT	CYPERACEAE	PNEGL	OBL
CAREX TRISPERMA	CATR10	SEDGE; THREE-SEED	CYPERACEAE	PNGL	OBL
CAREX TUCKERMANII	CATU2	SEDGE; TUCKERMAN'S	CYPERACEAE	PNGL	OBL
CAREX VAGINATA	CAVA2	SEDGE; SHEATHED	CYPERACEAE	PNGL	OBL
CAREX VESICARIA	CAVE6	SEDGE; INFLATED	CYPERACEAE	PNEGL	OBL
CAREX VIRIDULA	CAVI5	SEDGE; LITTLE GREEN	CYPERACEAE	PNGL	OBL
CAREX VULPINOIDEA	CAVU2	SEDGE; FOX	CYPERACEAE	PNEGL	OBL

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU'' ↔ FAC' ↔ FAC' ↔ FACW ↔ FACW' ↔ OBL}

Species						
Scientific Name	Indicator	Abrev.	Common Name	Family	Habit	Status
CAREX WILLDENOWII		CAWI2	SEDGE; WILLDENOW'S	CYPERACEAE	PNGL	FACU-*
CAREX WOODII		CAWO2	SEDGE; PRETTY	CYPERACEAE	GL	FAC
CAREX X MOLESTA		CAMO11	SEDGE; TROUBLESOME	CYPERACEAE	PNGL	FAC+
CAREX X STIPATA		CAST5	SEDGE; STALK-GRAIN	CYPERACEAE	PNGL	OBL
CAREX X TINCTA		CATI2	SEDGE; TINGED	CYPERACEAE	PNGL	NI
CARPINUS CAROLINIANA		CACA18	HORNBEAM; AMERICAN	BETULACEAE	NT	FAC
CARYA CORDIFORMIS		CACO15	HICKORY; BITTER-NUT	JUGLANDACEAE	NT	FAC
CARYA OVATA		CAOV2	HICKORY; SHAG-BARK	JUGLANDACEAE	NT	FACU
CASSIA FASCICULATA		CAFA	PEA; PARTRIDGE	FABACEAE	ANF	FACU-
CASTILLEJA COCCINEA		CACO17	INDIAN-PAINTBRUSH; SCARLET	SCROPHULARIACEAE	ANF	FAC
CELASTRUS SCANDENS		CESC	BITTER-SWEET; AMERICAN	CELASTRACEAE	NSWV	FACU*
CELTIS OCCIDENTALIS		CEOC	HACKBERRY; COMMON	ULMACEAE	NTS	FAC-
CENTUNCULUS MINIMUS		CEMI	CHAFFWEED	PRIMULACEAE	ANF	FACU-
CEPHALANTHUS OCCIDENTALIS		CEOC2	BUTTONBUSH; COMMON	RUBIACEAE	NT	OBL
CERASTIUM ARVENSE		CEAR4	CHICKWEED; MOUSE-EAR	CARYOPHYLLACEAE	PNF	FACU-
CERASTIUM BRACHYPODUM		CEBR3	CHICKWEED; SHORT-STALK	CARYOPHYLLACEAE	AIF	FACU-
CERASTIUM NUTANS		CENU2	CHICKWEED; NODDING	CARYOPHYLLACEAE	ANF	FACU+
CERASTIUM VULGATUM		CEVU	CHICKWEED; COMMON MOUSE-EAR	CARYOPHYLLACEAE	PIF	FACU
CERATOPHYLLUM DEMERSUM		CEDE4	HORNWORT; COMMON	CERATOPHYLLACEAE	PN/F	OBL
CERATOPHYLLUM MURICATUM		CEMU3	HORNWORT; PRICKLY	CERATOPHYLLACEAE	PNZF	OBL
CHAMAEDAPHNE CALYCVLATA		CHCA2	LEATHERLEAF	ERICACEAE	NS	OBL
CHELONE GLABRA		CHGL2	TURTLEHEAD; WHITE	SCROPHULARIACEAE	PNF	OBL
CHELONE OBLIQUA		CHOB3	TURTLEHEAD; RED	SCROPHULARIACEAE	PNF	OBL
CHENOPODIUM ALBUM		CHAL7	GOOSEFOOT; WHITE	CHENOPODIACEAE	AIF	FAC-
CHENOPODIUM BOTRYS		CHBO2	JERUSALEM-OAK	CHENOPODIACEAE	AIF	FACU-
CHENOPODIUM GLAUCUM		CHGL3	GOOSEFOOT; OAKLEAF	CHENOPODIACEAE	AIF	FACU-
CHENOPODIUM LEPTOPHYLLUM		CHLE4	GOOSEFOOT; NARROW-LEAF	CHENOPODIACEAE	ANF	FACU-
CHENOPODIUM RUBRUM		CHRU	GOOSEFOOT; COAST-BLITE	CHENOPODIACEAE	ANF	OBL
CHENOPODIUM SALINUM		CHSA2	PIGWEED; ROCKY MOUNTAIN	CHENOPODIACEAE	ANF	NI
CHRYSOSPLENIUM AMERICANUM		CHAM2	GOLDEN-SAXIFRAGE; AMERICAN	SAXIFRAGACEAE	PNF	OBL
CICUTA BULBIFERA		CIBU	WATER-HEMLOCK; BULBLET-BEARING	APIACEAE	PNF	OBL
CICUTA DOUGLASII		CIDO	WATER-HEMLOCK; WESTERN	APIACEAE	PNF	OBL
CICUTA MACULATA		CIMA2	WATER-HEMLOCK; SPOTTED	APIACEAE	PNF	OBL
CINNA ARUNDINACEA		CIAR2	WOOD-REEDGRASS; STOUT	POACEAE	PNG	FACW
CINNA LATIFOLIA		CILA2	WOOD-REEDGRASS; SLENDER	POACEAE	PNG	FACW+
CIRCAEA ALPINA		CIAL	NIGHTSHADE; SMALL ENCHANTER'S	ONAGRACEAE	PNF	FACW
CIRCAEA LUTETIANA		CILU	NIGHTSHADE; SOUTHERN BROAD-LEAF	ENCHANTER'	ONAGRACEAE	PNF
		FACU				
CIRSIUM ARVENSE		CIAR4	THISTLE; CREEPING	ASTERACEAE	PIF	FACU
CIRSIUM FLODMANII		CIFL	THISTLE; FLODMAN'S	ASTERACEAE	PNF	NI
CIRSIUM MUTICUM		CIMU	THISTLE; SWAMP	ASTERACEAE	BNF	OBL
CIRSIUM UNDULATUM		CIUN	THISTLE; WAVY-LEAF	ASTERACEAE	BPNF	FAC-
CIRSIUM VULGARE		CIVU	THISTLE; BULL	ASTERACEAE	BIF	FACU-
CLADIUM MARISCOIDES		CLMA	SAWGRASS; SMOOTH	CYPERACEAE	PNEGL	OBL
CLAYTONIA CAROLINIANA		CLCA	SPRINGBEAUTY; BROAD-LEAF	PORTULACACEAE	PNF	FACU
CLAYTONIA VIRGINICA		CLVI3	SPRINGBEAUTY; NARROW-LEAF	PORTULACACEAE	PNF	FACU
CLEMATIS VIRGINIANA		CLVI5	VIRGIN'S-BOWER; VIRGINIA	RANUNCULACEAE	PNV	FAC
CLEOME SERRULATA		CLSE	SPIDER-FLOWER; BEE	CAPPARIDACEAE	ANF	FACU-

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FAC' ↔ FAC ↔ FACW ↔ FACW' ↔ FACW' ↔ OBL}

Species					
Indicator					
Scientific Name	Abrev.	Common Name	Family	Habit	Status
CLEOME SPINOSA	CLSP3	SPIDER-FLOWER; SPINY	CAPPARIDACEAE	AIF	FACU*
CLINTONIA BOREALIS	CLBO3	BEADLILY; BLUE	LILIACEAE	PNF	FAC+
COELOGLOSSUM VIRIDE	COVI6	ORCHID; LONG-BRACT GREEN	ORCHIDACEAE	PNF	FAC
COLLOMIA LINEARIS	COLI2	COLLOMIA; NARROW-LEAF	POLEMONIACEAE	ANF	FACU
COMANDRA UMBELLATA	COUM	TOAD-FLAX; UMBELLATE BASTARD	SANTALACEAE	PN+F	FACU
COMMELINA COMMUNIS	COCO3	DAYFLOWER; ASIATIC	COMMELINACEAE	AIF	FAC
COMMELINA DIFFUSA	CODI5	DAYFLOWER; SPREADING	COMMELINACEAE	AIF	FACW
CONIOSELINUM CHINENSE	COCH2	HEMLOCK-PARSLEY	APIACEAE	PNF	FACW
CONYZA CANADENSIS	COCA5	HORSEWEED; CANADA	ASTERACEAE	ANF	FAC-
COPTIS TRIFOLIA	COTR2	GOLDTHREAD; ALASKA	RANUNCULACEAE	PNF	FACW
CORALLORRHIZA MACULATA	COMA4	CORALROOT; SPOTTED	ORCHIDACEAE	PN-F	FACU-
CORALLORRHIZA STRIATA	COST	CORALROOT; STRIPED	ORCHIDACEAE	PN-F	FACU-
CORALLORRHIZA TRIFIDA	COTR3	CORALROOT; EARLY	ORCHIDACEAE	PN-F	FACW-
COREOPSIS LANCEOLATA	COLA5	TICKSEED; LANCE-LEAF	ASTERACEAE	PNF	FACU
COREOPSIS TINCTORIA	COTI3	TICKSEED; GOLDEN	ASTERACEAE	ANF	FAC-
CORISPERMUM HYSSOPIFOLIUM	COHY	TICK-SEED; COMMON	CHENOPODIACEAE	AIF	FACU
CORNUS AMOMUM	COAM2	DOGWOOD; SILKY	CORNACEAE	NS	FACW+
CORNUS CANADENSIS	COCA13	BUNCHBERRY; CANADA	CORNACEAE	NS	FAC
CORNUS FOEMINA	COFO	DOGWOOD; STIFF	CORNACEAE	NS	FACW-
CORNUS SERICEA	COST4	DOGWOOD; RED-OSIER	CORNACEAE	NS	FACW
CORYDALIS FLAVULA	COFL3	CORYDALIS; YELLOW	PAPAVERACEAE	ANF	FACU+
CORYLUS AMERICANA	COAM3	HAZEL-NUT; AMERICAN	BETULACEAE	NS	FACU-
CORYLUS CORNUTA	COCO6	HAZEL-NUT; BEAKED	BETULACEAE	NS	UPL
CRASSULA AQUATICA	CRAQ	PYGMY-WEED; WATER	CRASSULACEAE	ANSF	NI
CRATAEGUS CRUS-GALLI	CRCR2	HAWTHORN; COCKSPUR	ROSACEAE	NTS	FAC
CRATAEGUS DOUGLASII	CRDO2	HAWTHORN; DOUGLAS'	ROSACEAE	NT	FAC
CRATAEGUS MOLLIS	CRMO2	HAWTHORN; DOWNY	ROSACEAE	NT	FACW-
CREPIS RUNCINATA	CRRU3	HAWKSBEARD; DANDELION	ASTERACEAE	PNF	FACW
CRYPTOGRAMMA STELLERI	CRST2	ROCKBRAKE; FRAGILE	ADIANTACEAE	PNF3	FACU
CRYPTOTAENIA CANADENSIS	CRCA9	HONEWORT; CANADA	APIACEAE	PNF	FAC
CYCLOLOMA ATRIPLICIFOLIUM	CYAT	PIGWEEED; WINGED	CHENOPODIACEAE	ANF	FACU
CYPERUS ACUMINATUS	CYAC2	FLATSEEDGE; SHORT-POINT	CYPERACEAE	ABPNGL	OBL
CYPERUS ARISTATUS	CYAR3	FLATSEEDGE; AWNED	CYPERACEAE	ANGL	OBL
CYPERUS COMPRESSUS	CYCO	FLATSEEDGE; POORLAND	CYPERACEAE	PNGL	FACW+
CYPERUS DIANDRUS	CYDI3	FLATSEEDGE; UMBRELLA	CYPERACEAE	ANGL	FACW+
CYPERUS ENGELMANNII	CYEN	FLATSEEDGE; ENGELMANN	CYPERACEAE	ANGL	OBL
CYPERUS ERYTHROHIZOS	CYER2	FLATSEEDGE; RED-ROOT	CYPERACEAE	APNEGL	OBL
CYPERUS ESCULENTUS	CYES	CHUFA	CYPERACEAE	PNGL	FACW
CYPERUS FERRUGINESCENS	CYFE4	FLATSEEDGE; RUSTY	CYPERACEAE	ANGL	OBL
CYPERUS FILICULMIS	CYFI2	FLATSEEDGE; SLENDER	CYPERACEAE	PNGL	FACU-
CYPERUS ODORATUS	CYOD	FLATSEEDGE; RUSTY	CYPERACEAE	APNGL	FACW
CYPERUS RIVULARIS	CYRI	FLATSEEDGE; SHINING	CYPERACEAE	ANGL	FACW+
CYPERUS ROTUNDUS	CYRO	FLATSEEDGE; PURPLE	CYPERACEAE	PIGL	FAC-
CYPERUS SCHWEINITZII	CYSC3	FLATSEEDGE; SCHWEINITZ'S	CYPERACEAE	PNGL	FACU+
CYPERUS STRIGOSUS	CYST	FLATSEEDGE; STRAW-COLOR	CYPERACEAE	PNEGL	FACW
CYPRIPEDIUM ACAULE	CYAC3	LADY'S-SLIPPER; PINK	ORCHIDACEAE	PNF	FACW
CYPRIPEDIUM ARIETINUM	CYAR5	LADY'S-SLIPPER; RAM'S-HEAD	ORCHIDACEAE	PNF	FACW+
CYPRIPEDIUM CALCEOLUS	CYCA3	LADY'S-SLIPPER; SMALL YELLOW	ORCHIDACEAE	PNF	FAC+

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU' ↔ FAC' ↔ FAC ↔ FAC' ↔ FACW ↔ FACW' ↔ FACW' ↔ OBL}

Species					
Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
CYPRIPEDIUM CANDIDUM	CYCA5	LADY'S-SLIPPER; SMALL WHITE	ORCHIDACEAE	PNF	OBL
CYPRIPEDIUM REGINAE	CYRE6	LADY'S-SLIPPER; SHOWY	ORCHIDACEAE	PNF	FACW+
CYPRIPEDIUM X ANDREWSII	CYAN2	LADY'S-SLIPPER; ANDREW'S	ORCHIDACEAE	PNF	FACW
CYSTOPTERIS BULBIFERA	CYBU3	FERN; BULBLET	ASPLENIACEAE	PNF3	FACW-
CYSTOPTERIS FRAGILIS	CYFR2	FERN; BRITTLE	ASPLENIACEAE	PNF3	FACU
DACTYLIS GLOMERATA	DAGL	GRASS; ORCHARD	POACEAE	PIG	FACU
DALEA LEPORINA	DALE3	PRAIRIE-CLOVER; FOX-TAIL	FABACEAE	ANF	NI
DALIBARDA REPENS	DARE	ROBIN-RUN-AWAY	ROSACEAE	PNF	FACU-
DECODON VERTICILLATUS	DEVE	SWAMP-LOOSESTRIFE; HAIRY	LYTHRACEAE	PNF	OBL
DESCHAMPSIA CESPITOSA	DECA5	HAIRGRASS; TUFTED	POACEAE	PNG	FACW+
DESMANTHUS ILLINOENSIS	DEIL	BUNDLE-FLOWER; PRAIRIE	FABACEAE	PNF	FAC-
DESMODIUM CANADENSE	DECA7	TICK-TREFOIL; SHOWY	FABACEAE	PNF	FAC-
DICHANTHELIUM ACUMINATUM	DIAC2	GRASS; PANIC	POACEAE	PNG	FAC
DICHANTHELIUM BOREALE	DIBO	WITCHGRASS; NORTHERN	POACEAE	PNG	FACU+
DICHANTHELIUM DICHOTOMUM	DIDI6	WITCHGRASS; CYPRESS	POACEAE	PNG	FAC-
DICHANTHELIUM LATIFOLIUM	DILA8	WITCHGRASS; BROAD-LEAF	POACEAE	PNG	FACU
DICHANTHELIUM LEIBERGII	DILE2	WITCHGRASS; LEIBERG'S	POACEAE	PNG	FACU+
DICHANTHELIUM OLIGOSANTHES	DIOL	WITCHGRASS; HELLER'S	POACEAE	PNG	FACU
DICHANTHELIUM OVALE	DI OV	WITCHGRASS; EGG-LEAF	POACEAE	PNG	FACU
DICHANTHELIUM SABULORUM	DISA5	WITCHGRASS; HEMLOCK	POACEAE	PNG	FAC-
DIDIPLIS DIANDRA	DIDI	WATER-PURSLANE	LYTHRACEAE	ANZEF	OBL
DIGITARIA ISCHAEMUM	DIIS	CRABGRASS; SMOOTH	POACEAE	AIG	FACU
DIGITARIA SANGUINALIS	DISA	CRABGRASS; HAIRY	POACEAE	AIG	FACU
DIOSCOREA VILLOSA	DIV14	YAM; YELLOW	DIOSCOREACEAE	PNV	FAC-
DIRCA PALUSTRIS	DIPA9	LEATHER-WOOD; EASTERN	THYMELIACEAE	NS	FAC
DISTICHLIS SPICATA	DISP	SALTGRASS; SEASHORE	POACEAE	PNG	FACW
DISTICHLIS SPICATA	DISPS2	SALTGRASS; INLAND	POACEAE	PNG	NI
DODECATHEON MEADIA	DOME	SHOOTING-STAR; COMMON	PRIMULACEAE	PNF	FACU
DODECATHEON PULCHELLUM	DOPU	SHOOTING-STAR; FEW-FLOWER	PRIMULACEAE	PNF	NI
DRACOCEPHALUM PARVIFLORUM	DRPA2	DRAGON-HEAD; AMERICAN	LAMIACEAE	PNF	FACU
DROSERA ANGLICA	DRAN	SUNDEW; ENGLISH	DROSERACEAE	PNF	NI
DROSERA INTERMEDIA	DRIN3	SUNDEW; SPOON-LEAF	DROSERACEAE	PNEF	OBL
DROSERA LINEARIS	DRLI	SUNDEW; SLENDER-LEAF	DROSERACEAE	PNF	OBL
DROSERA LONGIFOLIA	DRLO3	SUNDEW; NARROW-LEAF	DROSERACEAE	N	OBL
DROSERA ROTUNDIFOLIA	DRRO	SUNDEW; ROUND-LEAF	DROSERACEAE	PNEF	OBL
DRYOPTERIS CLINTONIANA	DRCL	WOODFERN; CLINTON	ASPLENIACEAE	PNF3	FACW+
DRYOPTERIS CRISTATA	DRCR4	SHIELD-FERN; CRESTED	ASPLENIACEAE	PNEF3	OBL
DRYOPTERIS DILATATA	DRDI2	WOODFERN; MOUNTAIN	ASPLENIACEAE	PNF3	FAC
DRYOPTERIS GOLDIANA	DRGO	WOODFERN; GOLDIE	ASPLENIACEAE	PNF3	FAC
DRYOPTERIS INTERMEDIA	DRIN	WOODFERN; EVERGREEN	ASPLENIACEAE	PNF3	FAC
DRYOPTERIS MARGINALIS	DRMA4	SHIELD-FERN; MARGINAL	ASPLENIACEAE	PNF3	FACU
DRYOPTERIS SPINULOSA	DRSP4	WOODFERN; SPINULOSE	ASPLENIACEAE	F3	FACW-
DRYOPTERIS X BOOTTII	DRBO2	WOODFERN; BOOTT	ASPLENIACEAE	PNF3	FACW-
DRYOPTERIS X TRIPLOIDEA	DRTR	WOODFERN; FRUITY SHIELD	ASPLENIACEAE	PNF3	FAC
DRYOPTERIS X ULIGINOSA	DRUL	WOODFERN; OVIEDO	ASPLENIACEAE	F3	FAC*
DULICHIMUM ARUNDINACEUM	DUAR3	SEDGE; THREE-WAY	CYPERACEAE	PNEGL	OBL
ECHINOCHLOA CRUSGALLI	ECCR	GRASS; BARNYARD	POACEAE	AIG	FACW
ECHINOCHLOA MURICATA	ECMU2	GRASS; ROUGH BARNYARD	POACEAE	ANG	OBL
ECHINOCHLOA WALTERI	ECWA	COCKSPUR; COAST	POACEAE	ANEG	OBL
ECHINOCYSTIS LOBATA	ECLO	MOCK-CUCUMBER; WILD	CUCURBITACEAE	ANF	FACW-

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FAC' ↔ FAC' ↔ FAC' ↔ FACW ↔ FACW' ↔ FACW' ↔ OBL}

Species					
Indicator					
Scientific Name	Abrev.	Common Name	Family	Habit	Status
ECHINODORUS PARVULUS	ECPA6	BURHEAD; DWARF	ALISMACEAE	PNEF	OBL
ELAEAGNUS ANGUSTIFOLIA	ELAN	OLIVE; RUSSIAN	ELAEAGNACEAE	IST	FACU-
ELAEAGNUS COMMUTATA	ELCO	SILVER-BERRY; AMERICAN	ELAEAGNACEAE	NS	UPL*
ELATINE AMERICANA	ELAM3	WATER-WORT; AMERICAN	ELATINACEAE	ANEF	OBL
ELATINE MINIMA	ELMI	WATER-WORT; SMALL	ELATINACEAE	ANEF	OBL
ELATINE TRIANDRA	ELTR	WATER-WORT; THREE-STAMEN	ELATINACEAE	ANE/F	OBL
ELEOCHARIS ACICULARIS	ELAC	SPIKERUSH; LEAST	CYPERACEAE	PNEGL	OBL
ELEOCHARIS ACUTISQUAMATA	ELAC2	SPIKERUSH; SHARP-SCALE	CYPERACEAE	PNGL	NI
ELEOCHARIS COMPRESSA	ELCO2	SPIKERUSH; FLAT-STEM	CYPERACEAE	PNEGL	FACW
ELEOCHARIS ENGELMANNII	ELEN	SPIKERUSH; ENGELMANN'S	CYPERACEAE	ANGL	FACW
ELEOCHARIS EQUIRETIDES	ELEQ	SPIKERUSH; HORSE-TAIL	CYPERACEAE	PNEGL	OBL
ELEOCHARIS ERYTHROPODA	ELER	SPIKERUSH; BALD	CYPERACEAE	PNGL	OBL
ELEOCHARIS HALOPHILA	ELHA2	SPIKERUSH; SALT-MARSH	CYPERACEAE	GL	NI
ELEOCHARIS INTERMEDIA	ELIN	SPIKERUSH; MATTED	CYPERACEAE	PNGL	FACW
ELEOCHARIS MACROSTACHYA	ELMA5	SPIKERUSH; CREEPING	CYPERACEAE	PNEGL	OBL
ELEOCHARIS NITIDA	ELNI	SPIKERUSH; SLENDER	CYPERACEAE	PNGL	OBL
ELEOCHARIS OBTUSA	ELOB2	SPIKERUSH; BLUNT	CYPERACEAE	APNEGL	OBL
ELEOCHARIS OLIVACEA	ELOL	SPIKERUSH; BRIGHT-GREEN	CYPERACEAE	PNGL	OBL
ELEOCHARIS OVATA	ELOV	SPIKERUSH; OVATE	CYPERACEAE	ANEGL	OBL
ELEOCHARIS PALUSTRIS	ELPA3	SPIKERUSH; CREEPING	CYPERACEAE	PNEGL	OBL
ELEOCHARIS PARVULA	ELPA5	SPIKERUSH; SMALL	CYPERACEAE	PNGL	OBL
ELEOCHARIS PAUCIFLORA	ELPA6	SPIKERUSH; FEW-FLOWER	CYPERACEAE	PNGL	OBL
ELEOCHARIS QUADRANGULATA	ELQU	SPIKERUSH; SQUARE-STEM	CYPERACEAE	PNEGL	OBL
ELEOCHARIS ROBBINSII	ELRO	SPIKERUSH; ROBBINS'	CYPERACEAE	PNGL	OBL
ELEOCHARIS ROSTELLATA	ELRO2	SPIKERUSH; BEAKED	CYPERACEAE	PNGL	OBL
ELEOCHARIS SMALLII	ELSM	SPIKERUSH; SMALL'S	CYPERACEAE	PNGL	OBL
ELEOCHARIS WOLFII	ELWO	SPIKERUSH; WOLF'S	CYPERACEAE	PNEGL	OBL
ELEUSINE INDICA	ELIN3	GOOSEGRASS; INDIA	POACEAE	AIG	FACU
ELLISIA NYCTELEA	ELNY	BABY-BLUE-EYES; FALSE	HYDROPHYLLACEAE	ANF	FAC+
ELODEA CANADENSIS	ELCA7	WATER-WEED; BROAD	HYDROCHARITACEAE	PNZF	OBL
ELODEA NUTTALLII	ELNU2	WATER-WEED; NUTTALL'S	HYDROCHARITACEAE	PNZF	OBL
ELYMUS CANADENSIS	ELCA4	WILD-RYE; NODDING	POACEAE	PNG	FAC-
ELYMUS CINEREUS	ELC12	WILD-RYE; BASIN	POACEAE	PNG	NI
ELYMUS CONDENSATUS	ELCO4	WILD-RYE; GIANT	POACEAE	PNG	NI
ELYMUS VILLOSUS	ELV1	WILD-RYE; HAIRY	POACEAE	PNG	FACU
ELYMUS VIRGINICUS	ELV13	WILD-RYE; VIRGINIA	POACEAE	PNG	FACW-
ELYMUS WIEGANDII	ELWI	WILD-RYE; WIEGAND'S	POACEAE	G	FAC
EMPETRUM NIGRUM	EMNI	CROWBERRY; BLACK	EMPETRACEAE	NS	FACW-
EMPETRUM RUBRUM	EMRU	CROWBERRY; PURPLE	EMPETRACEAE	NS	NI
ENEMION BITERNATUM	ENBI	RUE-ANEMONE; FALSE	RANUNCULACEAE	PNF	FAC
EPILOBIUM ANGUSTIFOLIUM	EPAN2	FIREWEED	ONAGRACEAE	PNF	FAC
EPILOBIUM BRACHYCARPUM	EPBR3	WILLOW-HERB; PANICLED	ONAGRACEAE	ANF	NI
EPILOBIUM CILIATUM	EPCI	WILLOW-HERB; HAIRY	ONAGRACEAE	PNF	FACU
EPILOBIUM COLORATUM	EPCO	WILLOW-HERB; PURPLE-LEAF	ONAGRACEAE	PNF	OBL
EPILOBIUM HORNEMANNII	EPHO	WILLOW-HERB; HORNEMANN'S	ONAGRACEAE	PNF	NI
EPILOBIUM LEPTOPHYLLUM	EPLE2	WILLOW-HERB; LINEAR-LEAF	ONAGRACEAE	PNF	OBL
EPILOBIUM PALUSTRE	EPPA	WILLOW-HERB; MARSH	ONAGRACEAE	PNF	OBL
EPILOBIUM STRICTUM	EPST	WILLOW-HERB; DOWNY	ONAGRACEAE	PNF	OBL
EQUISETUM ARVENSE	EQAR	HORSETAIL; FIELD	EQUISETACEAE	PNH2	FAC
EQUISETUM FLUVIATILE	EQFL	HORSETAIL; WATER	EQUISETACEAE	PNH2	OBL
EQUISETUM HYEMALE	EQHY	HORSETAIL; ROUGH	EQUISETACEAE	PNH2	FACW-
EQUISETUM LAEVIGATUM	EQLA	SCOURING-RUSH; SMOOTH	EQUISETACEAE	PNH2	FACW
EQUISETUM PALUSTRE	EQPA	HORSETAIL; MARSH	EQUISETACEAE	PNH2	FACW
EQUISETUM PRATENSE	EQPR	HORSETAIL; MEADOW	EQUISETACEAE	PNH2	FACW
EQUISETUM SCIRPOIDES	EQSC	SCOURING-RUSH; DWARF	EQUISETACEAE	PNH2	FAC+
EQUISETUM SYLVATICUM	EQSY	HORSETAIL; WOODLAND	EQUISETACEAE	PNH2	FACW
EQUISETUM VARIEGATUM	EQVA	HORSETAIL; VARIEGATED	EQUISETACEAE	PNH2	FACW
EQUISETUM X FERRISSII	EQFE	SCOURING-RUSH; INTERMEDIATE	EQUISETACEAE	PNH2	FACW
EQUISETUM X LITORALE	EQLI	HORSETAIL; SHORE	EQUISETACEAE	PNH2	OBL

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU'' ↔ FAC' ↔ FAC' ↔ FACW ↔ FACW' ↔ FACW'' ↔ OBL}

Species Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
EQUISETUM X NELSONII	EQNE	HORSETAIL; NELSON VARIEGATED	EQUISETACEAE	PNH2	FAC+
EQUISETUM X TRACHYODON	EQTR	HORSETAIL; ROUGH-TOOTH	EQUISETACEAE	PH2	FACW+
ERAGROSTIS CILIANENSIS	ERCI	STINKGRASS	POACEAE	AIG	FACU
ERAGROSTIS FRANKII	ERFR	LOVEGRASS; FRANK'S	POACEAE	ANG	FACW
ERAGROSTIS HYPNOIDES	ERHY	LOVEGRASS; TEAL	POACEAE	ANG	OBL
ERAGROSTIS PECTINACEA	ERPE	LOVEGRASS; PURPLE	POACEAE	ANG	FAC
ERAGROSTIS PILOSA	ERPI2	LOVEGRASS; INDIA	POACEAE	AIG	FACU
ERAGROSTIS REPTANS	ERRE2	LOVEGRASS; HAIRY CREEPING	POACEAE	ANG	OBL
ERAGROSTIS SPECTABILIS	ERSP	LOVEGRASS; PURPLE	POACEAE	PNG	UPL
ERECHTITES HIERACIFOLIA	ERHI2	BURN; AMERICAN	ASTERACEAE	ANF	FACU
ERIGERON ACRIS	ERAC2	FLEABANE; BITTER	ASTERACEAE	BPF	FAC
ERIGERON ANNUUS	ERAN	FLEABANE; WHITE-TOP	ASTERACEAE	ANF	FAC-
ERIGERON LONCHOPHYLLUS	ERLO	FLEABANE; LOW MEADOW	ASTERACEAE	BNF	FACW-
ERIGERON PHILADELPHICUS	ERPH	FLEABANE; PHILADELPHIA	ASTERACEAE	BNF	FACW
ERIGERON PULCHELLUS	ERPU	PLANTAIN; ROBIN'S	ASTERACEAE	PNF	FACU
ERIGERON STRIGOSUS	ERST3	FLEABANE; PRAIRIE	ASTERACEAE	ANF	FAC-
ERIOCAULON SEPTANGULARE	ERSE4	BUTTONS; WHITE	ERIOCAULACEAE	PIEF	OBL
ERIOCHLOA CONTRACTA	ERCO8	CUPGRASS; PRAIRIE	POACEAE	ANG	FAC
ERIOPHORUM ALPINUM	ERAL10	COTTON-GRASS; ALPINE	CYPERACEAE	PNGL	OBL
ERIOPHORUM ANGUSTIFOLIUM	ERAN6	COTTON-GRASS; NARROW-LEAF	CYPERACEAE	PNGL	OBL
ERIOPHORUM CHAMISSONIS	ERCH7	COTTON-GRASS; RUSSET	CYPERACEAE	PNGL	OBL
ERIOPHORUM GRACILE	ERGR8	COTTON-GRASS; SLENDER	CYPERACEAE	PNEGL	OBL
ERIOPHORUM POLYSTACHION	ERPO6	COTTON-GRASS; COLDSWAMP	CYPERACEAE	PNGL	OBL
ERIOPHORUM SPISSUM	ERSP8	HARE'S-TAIL	CYPERACEAE	PNGL	OBL
ERIOPHORUM TENELLUM	ERTE12	COTTON-GRASS; FEW-NERVE	CYPERACEAE	PNGL	OBL
ERIOPHORUM VIRGINICUM	ERV18	COTTON-GRASS; TAWNY	CYPERACEAE	PNEGL	OBL
ERIOPHORUM VIRIDICARINATUM	ERV19	COTTON-GRASS; GREEN-KEEL	CYPERACEAE	PNEGL	OBL
ERYNGIUM YUCCIFOLIUM	ERYU	RATTLESNAKE-MASTER	APIACEAE	PNF	FAC+
ERYSIMUM CHEIRANTHOIDES	ERCH9	WALLFLOWER; WORM-SEED	BRASSICACEAE	ANF	FACU
EUONYMUS ATROPURPUREUS	EUAT	BURNING-BUSH; EASTERN	CELASTRACEAE	NST	FAC-
EUPATORIADELPHUS MACULATUS	EUMA12	JOE-PYE-WEED; SPOTTED	ASTERACEAE	PNF	OBL
EUPATORIADELPHUS PURPUREUS	EUPU8	JOE-PYE-WEED; SWEET	ASTERACEAE	PNF	FAC
EUPATORIUM PERFOLIATUM	EUPE3	BONESET; COMMON	ASTERACEAE	PNF	FACW+
EUPATORIUM SEROTINUM	EUSE2	THOROUGH-WORT; LATE-FLOWERING	ASTERACEAE	PNF	FAC+
EUPHORBIA COMMUTATA	EUCO8	SPURGE; TINTED WOOD	EUPHORBIAACEAE	ANF	UPL
EUPHORBIA HETEROPHYLLA	EUHE4	SPURGE; PAINTED	EUPHORBIAACEAE	ANF	NI
EUPHORBIA MACULATA	EUMA7	BROOMSPURGE; SPOTTED	EUPHORBIAACEAE	ANF	FACU-
EUPHORBIA MARGINATA	EUMA8	SNOW-ON-THE-MOUNTAIN	EUPHORBIAACEAE	ANF	FACU-
EUPHORBIA NUTANS	EUNU	BROOMSPURGE; EYEBANE	EUPHORBIAACEAE	AIF	FACU
EUPHRASIA ARCTICA	EUAR3	EYERRIGHT; GLANDULAR	SCROPHULARIACEAE	AIF	FACW+
EUTHAMIA GRAMINIFOLIA	EUGR5	FRAGRANT-GOLDEN-ROD; FLAT-TOP	ASTERACEAE	PNF	FACW-
FESTUCA ARUNDINACEA	FEAR3	FESCUE; KENTUCKY	POACEAE	PIG	FACU+
FESTUCA OBTUSA	FEOB	FESCUE; NODDING	POACEAE	PNG	FACU+
FESTUCA PARADOXA	FEP A2	FESCUE; CLUSTER	POACEAE	PNG	FAC
FESTUCA PRATENSIS	FEP R	FESCUE; MEADOW	POACEAE	PIG	FACU-
FESTUCA RUBRA	FERU2	FESCUE; RED	POACEAE	PNG	FAC-
FILAGINELLA ULIGINOSA	FIUL2	CUDWEED; LOW	ASTERACEAE	N	FAC
FILIPENDULA RUBRA	FIRU2	QUEEN-OF-THE-PRAIRIE	ROSACEAE	PNF	FACW+
FIMBRISTYLIS AUTUMNALIS	FIAU2	FIMBRY; SLENDER	CYPERACEAE	GL	FACW+
FLOERKEA PROSERPINACOIDES	FLPR	MERMAID-WEED; FALSE	LIMNANTHACEAE	ANF	FAC+
FRAGARIA VIRGINIANA	FRVI	STRAWBERRY; VIRGINIA	ROSACEAE	PNF	FAC-

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU'' ↔ FAC' ↔ FAC' ↔ FACW ↔ FACW' ↔ FACW'' ↔ OBL}

Species Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
FRAXINUS AMERICANA	FRAM2	ASH; WHITE	OLEACEAE	NT	FACU
FRAXINUS NIGRA	FRNI	ASH; BLACK	OLEACEAE	NT	FACW+
FRAXINUS PENNSYLVANICA	FRPE	ASH; GREEN	OLEACEAE	NT	FACW
GALIAM APARINE	GAAP2	BEDSTRAW; CATCHWEED	RUBIACEAE	ANF	FACU
GALIAM ASPRELLUM	GAAS2	BEDSTRAW; ROUGH	RUBIACEAE	PNF	OBL
GALIAM BOREALE	GABO2	BEDSTRAW; NORTHERN	RUBIACEAE	PNF	FAC
GALIAM BREVIPEDES	GABR6	BEDSTRAW; LIMESTONE SWAMP	RUBIACEAE	PNF	OBL
GALIAM CIRCAEZANS	GACI2	LICORICE; WILD	RUBIACEAE	PNF	FACU-
GALIAM CONCINNUM	GACO3	BEDSTRAW; SHINING	RUBIACEAE	PNF	FACU
GALIAM LABRADORICUM	GALA2	BEDSTRAW; NORTHERN BOG	RUBIACEAE	PNF	OBL
GALIAM OBTUSUM	GAOB	BEDSTRAW; BLUNT-LEAF	RUBIACEAE	PNF	FACW+
GALIAM TINCTORIUM	GATI	BEDSTRAW; STIFF MARSH	RUBIACEAE	PNF	OBL
GALIAM TRIFIDUM	GATR2	BEDSTRAW; SMALL	RUBIACEAE	PNF	FACW+
GALIAM TRIFLORUM	GATR3	BEDSTRAW; SWEET-SCENT	RUBIACEAE	PNF	FACU+
GAULTHERIA HISPIDULA	GAHI2	SNOWBERRY; CREEPING	ERICACEAE	NS	FACW
GAULTHERIA PROCUMBENS	GAPR2	TEABERRY	ERICACEAE	NS	FACU
GAURA BIENNIS	GABI2	BUTTERFLY-WEED; BIENNIAL	ONAGRACEAE	BNF	FACU-
GAYLUSSACIA BACCATA	GABA	HUCKLEBERRY; BLACK	ERICACEAE	NS	FACU
GENTIANA AFFINIS	GEAF	GENTIAN; PRAIRIE	GENTIANACEAE	PNF	NI
GENTIANA ALBA	GEAL4	GENTIAN; YELLOW	GENTIANACEAE	PF	FACU
GENTIANA ANDREWSII	GEAN	GENTIAN; FRINGE-TOP BOTTLE	GENTIANACEAE	PNF	FACW
GENTIANA CLAUSA	GECL	GENTIAN; CLOSED	GENTIANACEAE	PNF	FACW+
GENTIANA RUBRICAULIS	GERU	GENTIAN; CLOSED	GENTIANACEAE	PNF	OBL
GENTIANA SAPONARIA	GESA	GENTIAN; SOAPWORD	GENTIANACEAE	PNF	FACW-
GENTIANELLA AMARELLA	GEAM3	GENTIAN; NORTHERN	GENTIANACEAE	ABNF	OBL
GENTIANELLA QUINQUEFOLIA	GEQU2	GENTIAN; STIFF	GENTIANACEAE	ANF	FAC
GENTIANOPSIS CRINITA	GECR2	GENTIAN; FRINGED	GENTIANACEAE	ABF	FACW+
GENTIANOPSIS PROCERA	GEPR6	GENTIAN; LESSER FRINGED	GENTIANACEAE	ANF	OBL
GENTIANOPSIS VIRGATA	GEVI6	GENTIAN; LESSER FRINGED	GENTIANACEAE	ANF	OBL*
GEOCAULON LIVIDUM	GELI2	TOADFLAX; NORTHERN RED-FRUIT	SANTALACEAE	N	FACW-
GERANIUM MACULATUM	GEMA	CRANE'S-BILL; PURPLE	GERANIACEAE	PNF	FACU
GEUM ALEPPICUM	GEAL3	AVENS; YELLOW	ROSACEAE	PNF	FAC+
GEUM CANADENSE	GECA7	AVENS; WHITE	ROSACEAE	PNF	FAC
GEUM LACINIATUM	GELA	AVENS; ROUGH	ROSACEAE	PNF	FACW
GEUM MACROPHYLLUM	GEMA4	AVENS; LARGE-LEAF	ROSACEAE	PNF	FACW+
GEUM RIVALE	GERI2	AVENS; PURPLE	ROSACEAE	PNF	OBL
GEUM TRIFLORUM	GETR	WHISKERS; OLD-MAN'S	ROSACEAE	PNF	FACU-
GLAUX MARITIMA	GLMA	SEA-MILKWORT	PRIMULACEAE	PI5F	OBL*
GLECOMA HEDERACEA	GLHE	IVY; GROUND	LAMIACEAE	PIF	FACU
GLEDITSIA TRIACANTHOS	GLTR	HONEY-LOCUST	FABACEAE	NTS	FAC
GLYCERIA BOREALIS	GLBO	GRASS; SMALL FLOATING MANNA	POACEAE	PNEG	OBL
GLYCERIA CANADENSIS	GLCA	GRASS; CANADA MANNA	POACEAE	PNG	OBL
GLYCERIA MAXIMA	GLMA3	MEADOWGRASS; REED	POACEAE	PIG	OBL
GLYCERIA SEPTENTRIONALIS	GLSE3	GRASS; EASTERN MANNA	POACEAE	PNEG	OBL
GLYCERIA STRIATA	GLST	GRASS; FOWL MANNA	POACEAE	PNEG	OBL
GLYCYRRHIZA LEPIDOTA	GLLE3	LICORICE; AMERICAN	FABACEAE	PNF	FACU-
GOODYERA OBLONGIFOLIA	GOOB2	RATTLESNAKE-PLANTAIN; GIANT	ORCHIDACEAE	PNF	UPL
GOODYERA PUBESCENS	GOPU	RATTLESNAKE-PLANTAIN; DOWNY	ORCHIDACEAE	PNF	FAC*
GOODYERA REPENS	GORE2	RATTLESNAKE-PLANTAIN; DWARF	ORCHIDACEAE	PNF	FACU
GOODYERA TESSELATA	GOTE	RATTLESNAKE-PLANTAIN; CHECKERED	ORCHIDACEAE	PNF	FACU
GRATIOLA NEGLECTA	GRNE	HEDGEHYSSOP; CLAMMY	SCROPHULARIACEAE	ANEF	OBL

{Indicator status: UPL ↔ FACU ↔ FACU ↔ FACU\* ↔ FAC\* ↔ FAC ↔ FAC\* ↔ FACW ↔ FACW ↔ FACW\* ↔ OBL}

Scientific Name	Species Indicator		Family	Habit	Status
	Abrev.	Common Name			
GRINDELIA SQUARROSA	GRSQ	GUMWEED; CURLY-CUP	ASTERACEAE	ABPNF	FACU
GYMNOCARPIUM DRYOPTERIS	GYDR	FERN; OAK	ASPLENACEAE	PNF3	FAC
GYMNOCARPIUM ROBERTIANUM	GYRO	FERN; LIMESTONE OAK	ASPLENACEAE	PNF3	FACU
HACKELIA FLORIBUNDA	HAF2	STICKSEED; DAVIS MOUNTAIN	BORAGINACEAE	BPNF	NI
HACKELIA VIRGINIANA	HAVI2	STICKSEED; VIRGINIA	BORAGINACEAE	BPNF	FAC-
HALENIA DEFLEXA	HADE2	SPURRED-GENTIAN; AMERICAN	GENTIANACEAE	ANF	FAC
HAMAMELIS VIRGINIANA	HAVI4	WITCH-HAZEL; AMERICAN	HAMAMELIDACEAE	NST	FACU
HASTEOLA SUAVEOLENS	HASU3	INDIAN-PLANTAIN; SWEET-SCENT	ASTERACEAE	PNF	OBL
HELENIUM AUTUMNALE	HEAU	SNEEZEWEED; COMMON	ASTERACEAE	PNF	FACW+
HELENIUM FLEXUOSUM	HEFL	SNEEZEWEED; PURPLE-HEAD	ASTERACEAE	PNF	FAC+
HELIANTHUS ANNUUS	HEAN3	SUNFLOWER; COMMON	ASTERACEAE	ANF	FAC-
HELIANTHUS DECAPETALUS	HEDE	SUNFLOWER; THIN-LEAF	ASTERACEAE	PNF	UPL*
HELIANTHUS GIGANTEUS	HEGI	SUNFLOWER; TALL	ASTERACEAE	PNF	FACW
HELIANTHUS GROSSESERRATUS	HEGR4	SUNFLOWER; SAW-TOOTH	ASTERACEAE	PNF	FACW-
HELIANTHUS MAXIMILIANI	HEMA2	SUNFLOWER; MAXIMILIAN'S	ASTERACEAE	PNF	UPL
HELIANTHUS NUTTALLII	HENU	SUNFLOWER; NUTTALL'S	ASTERACEAE	PNF	NI
HELIANTHUS OCCIDENTALIS	HEOC2	SUNFLOWER; FEW-LEAF	ASTERACEAE	PNF	FACU-
HELIANTHUS TUBEROSUS	HETU	JERUSALEM-ARTICHOKE	ASTERACEAE	PNF	FAC
HEMICARPHA DRUMMONDII	HEDR3	DWARF-BULLRUSH; DRUMMOND'S	CYPERACEAE	ANGL	FACW+
HEMICARPHA MICRANTHA	HEMI5	DWARF-BULLRUSH	CYPERACEAE	ANGL	OBL
HERACLEUM LANATUM	HELA4	COW-PARSNIP	APIACEAE	PNF	FACW
HETERANTHERA LIMOSA	HELI2	MUD-PLANTAIN; BLUE	PONTEDERIACEAE	ANEF	OBL
HEUCHERA AMERICANA	HEAM6	ALUM-ROOT; AMERICAN	SAXIFRAGACEAE	PNF	FACU-
HEUCHERA RICHARDSONII	HERI	ALUM-ROOT; RICHARDSON'S	SAXIFRAGACEAE	PNF	FAC-
HIBISCUS LAEVIS	HILA2	ROSEMALLOW; HALBERD-LEAF	MALVACEAE	PNF	OBL
HIEROCHLOE ODORATA	HIOD	GRASS; HOLY	POACEAE	PNG	FACW
HIPPURIS VULGARIS	HIVU2	MARE'S-TAIL; COMMON	HIPPURIDACEAE	PNZF	OBL
HORDEUM JUBATUM	HOJU	BARLEY; FOX-TAIL	POACEAE	PNG	FAC+
HORDEUM PUSILLUM	HOPU	BARLEY; LITTLE	POACEAE	ANG	FAC
HUMULUS LUPULUS	HULU	HOP; COMMON	MORACEAE	PNVF	FACU*
HYDROCOTYLE AMERICANA	HYAM	PENNY-WORT; AMERICAN MARSH	APIACEAE	PIEF	OBL
HYDROCOTYLE UMBELLATA	HYUM	PENNY-WORT; MANY-FLOWER	APIACEAE	PNF	OBL
HYDROPHYLLUM VIRGINIANUM	HYVI	WATER-LEAF; VIRGINIA	HYDROPHYLLACEAE	PNF	FACW-
HYPERICUM BOREALE	HYBO2	ST. JOHN'S-WORT; NORTHERN	CLUSIACEAE	PNF	OBL
HYPERICUM CANADENSE	HYCA7	ST. JOHN'S-WORT; CANADIAN	CLUSIACEAE	ANF	FACW
HYPERICUM ELLIPTICUM	HYEL	ST. JOHN'S-WORT; PALE	CLUSIACEAE	PNF	OBL
HYPERICUM GENTIANOIDES	HYGE	ORANGE-GRASS	CLUSIACEAE	ANF	FACU
HYPERICUM MAJUS	HYMA2	ST. JOHN'S-WORT; LARGE CANADIAN	CLUSIACEAE	ANF	FACW
HYPERICUM MUTILUM	HYMU	ST. JOHN'S-WORT; SLENDER	CLUSIACEAE	PNF	FACW
HYPERICUM PROLIFICUM	HYPR	ST. JOHN'S-WORT; SHRUBBY	CLUSIACEAE	NS	FACU
HYPERICUM PUNCTATUM	HYPY	ST. JOHN'S-WORT; DOTTED	CLUSIACEAE	PNF	FAC+
HYPERICUM PYRAMIDATUM	HYPY	ST. JOHN'S-WORT; GREAT	CLUSIACEAE	PNF	FAC+
HYPOXIS HIRSUTA	HYHI2	STARGRASS; EASTERN YELLOW	AGAVACEAE	PNF	FAC
ILEX VERTICILLATA	ILVE	WINTERBERRY; COMMON	AQUIFOLIACEAE	NST	FACW+
IMPATIENS CAPENSIS	IMCA	TOUCH-ME-NOT; SPOTTED	BALSAMINACEAE	ANF	FACW
IMPATIENS PALLIDA	IMPA	TOUCH-ME-NOT; PALE	BALSAMINACEAE	ANF	FACW
IODANTHUS PINNATIFIDUS	IOPI	PURPLE-ROCKET	BRASSICACEAE	PNF	FACW

{Indicator status: UPL ↔ FACU' ↔ FACU ↔ FACU' ↔ FAC' ↔ FAC ↔ FAC' ↔ FACW ↔ FACW' ↔ FACW' ↔ OBL}

Species					
Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
IPOMOEA HEDERIFOLIA	IPHE2	MORNING-GLORY; IVY-LEAF	CONVOLVULACEAE	AIV	NI
IPOMOEA PURPUREA	IPPU2	MORNING-GLORY; COMMON	CONVOLVULACEAE	AIV	FACU-
IRIS MISSOURIENSIS	IRMI	IRIS; ROCKY MOUNTAIN	IRIDACEAE	PNF	OBL
IRIS PSEUDACORUS	IRPS	IRIS; YELLOW	IRIDACEAE	PIEF	OBL
IRIS SHREVEI	IRSH	BLUEFLAG; SOUTHERN	IRIDACEAE	PNF	OBL
IRIS VERSICOLOR	IRVE2	BLUEFLAG	IRIDACEAE	PNF	OBL
IRIS VIRGINICA	IRVI	BLUEFLAG; VIRGINIA	IRIDACEAE	PNF	OBL
ISOETES ECHINOSPORA	ISEC	QUILLWORT; SPINY-SPORE	ISOETACEAE	PZQ	OBL
ISOETES MACROSPORA	ISMA	QUILLWORT; LAKE	ISOETACEAE	PNZQ	OBL
ISOETES MELANOPODA	ISME	QUILLWORT; BLACKFOOT	ISOETACEAE	PNEQ	OBL
IVA XANTHIFOLIA	IVXA	SUMPWEED; COARSE	ASTERACEAE	ANF	FAC
JUGLANS CINEREA	JUCI	BUTTERNUT	JUGLANDACEAE	NT	FACU+
JUNCUS ACUMINATUS	JUAC	RUSH; TAPER-TIP	JUNCACEAE	PNEGL	OBL
JUNCUS ALPINUS	JUAL	RUSH; RICHARDSON'S	JUNCACEAE	PNGL	OBL
JUNCUS ARTICULATUS	JUAR4	RUSH; JOINTED	JUNCACEAE	PNGL	OBL
JUNCUS BALTICUS	JUBA	RUSH; BALTIC	JUNCACEAE	PNGL	OBL
JUNCUS BRACHYCARPUS	JUBR	RUSH; WHITE-ROOT	JUNCACEAE	PNGL	FACW
JUNCUS BRACHYCEPHALUS	JUBR2	RUSH; SMALL-HEAD	JUNCACEAE	PNGL	OBL
JUNCUS BREVICAUDATUS	JUBR4	RUSH; NARROW-PANICLE	JUNCACEAE	PNGL	OBL
JUNCUS BUFONIUS	JUBU	RUSH; TOAD	JUNCACEAE	ANGL	FACW+
JUNCUS CANADENSIS	JUCA3	RUSH; CANADA	JUNCACEAE	PNGL	OBL
JUNCUS EFFUSUS	JUEF	RUSH; SOFT	JUNCACEAE	PNEGL	OBL
JUNCUS FILIFORMIS	JUFI	RUSH; THREAD	JUNCACEAE	PNGL	FACW
JUNCUS GERARDII	JUGE	RUSH; SALTMEADOW	JUNCACEAE	PNGL	OBL
JUNCUS GREENEI	JUGR	RUSH; GREENE'S	JUNCACEAE	PNGL	FAC
JUNCUS INTERIOR	JUIN2	RUSH; INLAND	JUNCACEAE	PNGL	FAC+
JUNCUS LONGISTYLIS	JULO	RUSH; LONG-STYLE	JUNCACEAE	PNGL	FACW
JUNCUS MARGINATUS	JUMA4	RUSH; GRASS-LEAF	JUNCACEAE	PNGL	FACW
JUNCUS NODOSUS	JUNO2	RUSH; KNOTTED	JUNCACEAE	PNGL	OBL
JUNCUS PELOCARPUS	JUPE	RUSH; BROWN-FRUIT	JUNCACEAE	PNGL	OBL
JUNCUS STYGIUS	JUST	RUSH; MOOR	JUNCACEAE	PNGL	OBL
JUNCUS TENUIS	JUTE	RUSH; SLENDER	JUNCACEAE	PNGL	FAC
JUNCUS TORREYI	JUTO	RUSH; TORREY'S	JUNCACEAE	PNGL	FACW
JUNCUS VASEYI	JUVA	RUSH; VASEY'S	JUNCACEAE	PNGL	FACW
JUNIPERUS HORIZONTALIS	JUHO2	JUNIPER; CREEPING	CUPRESSACEAE	NS	FAC-
JUNIPERUS VIRGINIANA	JUVI	CEDAR; EASTERN RED	CUPRESSACEAE	NT	FACU
KALMIA POLIFOLIA	KAPO	LAUREL; PALE	ERICACEAE	NS	OBL
KOCHIA SCOPARIA	KOSC	SUMMER-CYPRESS; MEXICAN	CHENOPODIACEAE	AIF	FACU-
KRIGIA BIFLORA	KRBI	DWARF-DANDELION; TWO-FLOWER	ASTERACEAE	PNF	FACU
LACTUCA BIENNIS	LABI	LETTUCE; BIENNIAL	ASTERACEAE	ABNF	FAC
LACTUCA CANADENSIS	LACA	LETTUCE; TALL YELLOW	ASTERACEAE	ABNF	FACU+
LACTUCA FLORIDANA	LALF	LETTUCE; WOODLAND	ASTERACEAE	ABNF	FAC-
LACTUCA LUDOVICIANA	LALU	LETTUCE; BIENNIAL	ASTERACEAE	BNPF	UPL
LACTUCA PULCHELLA	LAPU	LETTUCE; CHICORY	ASTERACEAE	PNF	FAC
LACTUCA SERRIOLA	LASE	LETTUCE; PRICKLY	ASTERACEAE	ABIF	FAC
LAPORTEA CANADENSIS	LACA3	WOOD-NETTLE; CANADA	URTICACEAE	PNF	FACW
LARIX DECIDUA	LADE2	LARCH; EUROPEAN	PINACEAE	IT	NI
LARIX LARICINA	LALA	LARCH; AMERICAN	PINACEAE	NT	FACW
LATHYRUS JAPONICUS	LAJA	PEAVINE; BEACH	FABACEAE	PNF	FACU-
LATHYRUS PALUSTRIS	LAPA4	PEAVINE; VETCHLING	FABACEAE	PNF	FACW
LATHYRUS VENOSUS	LAVE	PEAVINE; SMOOTH VEINY	FABACEAE	PNF	FAC
LEDUM GROENLANDICUM	LEGR	LABRADOR-TEA; GREENLAND	ERICACEAE	NS	OBL
LEERSIA LENTICULARIS	LELE2	CUTGRASS; CATCHFLY	POACEAE	PNG	OBL
LEERSIA ORYZOIDES	LEOR	CUTGRASS; RICE	POACEAE	PNG	OBL

{Indicator status: UPL ↔ FACU ↔ FACU\* ↔ FAC\* ↔ FAC ↔ FAC\* ↔ FACW ↔ FACW\* ↔ OBL}

Scientific Name	Species Indicator		Family	Habit	Status
	Abrev.	Common Name			
LEERSIA VIRGINICA	LEVI2	WHITEGRASS	POACEAE	PNG	FACW
LEMNA MINOR	LEM3	DUCKWEED; LESSER	LEMNACEAE	PNF	OBL
LEMNA PERPUSILLA	LEPE	DUCKWEED; MINUTE	LEMNACEAE	PNF	OBL
LEMNA TRISULCA	LETR	DUCKWEED; STAR	LEMNACEAE	PNF	OBL
LEPIDIUM DENSIFLORUM	LEDE	PEPPER-GRASS; DENSE-FLOWER	BRASSICACEAE	ABNF	FAC
LEPIDIUM PERFOOLIATUM	LEPE2	PEPPER-GRASS; CLASPING	BRASSICACEAE	AIF	FAC
LEPIDIUM VIRGINICUM	LEVI3	PEPPER-GRASS; POOR-MAN'S	BRASSICACEAE	ABNF	FACU-
LEPTOCHLOA FASCICULARIS	LEFA	SPRANGLE-TOP; BEARDED	POACEAE	ANG	OBL
LESPEDEZA CAPITATA	LECA8	BUSHCLOVER; ROUND-HEAD	FABACEAE	PNF	FACU
LIATRIS LANCIFOLIA	LILA	GAYFEATHER; LANCE-LEAF	ASTERACEAE	PNF	NI
LIATRIS LIGULISTYLUS	LILI	GAYFEATHER; STRAP-STYLE	ASTERACEAE	PNF	NI
LIATRIS PYCNOSTACHYA	LIPY	GAYFEATHER; CATTAIL	ASTERACEAE	PNF	FAC-
LILIUM CANADENSE	LICA3	LILY; CANADA	LILIACEAE	PNF	FAC+
LILIUM PHILADELPHICUM	LIPH	LILY; WOOD	LILIACEAE	PNF	FAC-
LILIUM SUPERBUM	LISU?	LILY; TURK'S-CAP	LILIACEAE	PF	NI
LIMOSELLA AQUATICA	LIAQ	MUDWORT; NORTHERN	SCROPHULARIACEAE	APNEF	OBL
LIMOSELLA SUBULATA	LISU2	MUDWORT; SOUTHERN	SCROPHULARIACEAE	ANF	NI
LINDERNIA ANAGALLIDEA	LIAN2	FALSE-PIMPERNEL	SCROPHULARIACEAE	ANF	OBL
LINDERNIA DUBIA	LIDU	FALSE-PIMPERNEL; YELLOW-SEED	SCROPHULARIACEAE	ANF	OBL
LINDERNIA PROCUMBENS	LIPR2	FALSE-PIMPERNEL; EUROPEAN	SCROPHULARIACEAE	PNF	FACW
LINNAEA BOREALIS	LIBO3	TWINFLOWER	CAPRIFOLIACEAE	PNHF	FAC
LIPARIS LILIIFOLIA	LILI3	TWAYBLADE; LARGE	ORCHIDACEAE	PNF	FACU-
LIPARIS LOESELII	LILO	ORCHID; FEN	ORCHIDACEAE	PNF	FACW+
LISTERA AURICULATA	LIAU2	TWAYBLADE; AURICLED	ORCHIDACEAE	PNF	FACW+
LISTERA CONVALLARIOIDES	LICO5	TWAYBLADE; BROAD-LEAF	ORCHIDACEAE	PNF	FACW
LISTERA CORDATA	LICO6	TWAYBLADE; HEART-LEAF	ORCHIDACEAE	PNF	FACW
LITTORELLA UNIFLORA	LIUN	SHOREWEED; EUROPEAN	PLANTAGINACEAE	PNF	OBL
LOBELIA CARDINALIS	LOCA2	FLOWER; CARDINAL	CAMPANULACEAE	PNF	OBL
LOBELIA DORTMANNIA	LODO	LOBELIA; WATER	CAMPANULACEAE	PNF	OBL
LOBELIA INFLATA	LOIN	INDIAN-TOBACCO	CAMPANULACEAE	ANF	FACU-
LOBELIA KALMII	LOKA	LOBELIA; BROOK	CAMPANULACEAE	PNF	OBL
LOBELIA SIPHILITICA	LOSI	LOBELIA; GREAT BLUE	CAMPANULACEAE	PNF	FACW+
LOBELIA SPICATA	LOSP	LOBELIA; PALE-SPIKE	CAMPANULACEAE	PNF	FAC
LOLIUM PERENNE	LOPE	RYEGRASS; PERENNIAL	POACEAE	PIG	FACU
LONICERA CAERULEA	LOCA6	HONEYSUCKLE; SWEET-BERRY	CAPRIFOLIACEAE	NS	FACW*
LONICERA CANADENSIS	LOCA7	FLY-HONEY-SUCKLE; AMERICAN	CAPRIFOLIACEAE	NS	FACU
LONICERA DIOICA	LODI2	HONEYSUCKLE; MOUNTAIN	CAPRIFOLIACEAE	NWV	FACU
LONICERA HIRSUTA	LOHI	HONEYSUCKLE; HAIRY	CAPRIFOLIACEAE	NWV	FAC
LONICERA MORROWII	LOMO2	HONEYSUCKLE; MORROW'S	CAPRIFOLIACEAE	IS	NI
LONICERA OBLONGIFOLIA	LOOB	FLY-HONEY-SUCKLE; SWAMP	CAPRIFOLIACEAE	NS	OBL
LONICERA TATARICA	LOTA	HONEYSUCKLE; TARTARIAN	CAPRIFOLIACEAE	IS	FACU*
LONICERA X BELLA	LOBE	HONEYSUCKLE	CAPRIFOLIACEAE	IS	NI
LOTUS CORNICULATUS	LOCO6	TREFOIL; BIRDS-FOOT	FABACEAE	PIF	FAC-
LUDWIGIA PALUSTRIS	LUPA	SEEDBOX; MARSH	ONAGRACEAE	PNEF	OBL
LUDWIGIA POLYCARPA	LUPO	SEEDBOX; MANY-FRUIT	ONAGRACEAE	PNEF	OBL
LUZULA ACUMINATA	LUAC	WOODRUSH; HAIRY	JUNCACEAE	PNGL	FAC-
LUZULA MULTIFLORA	LUMU2	WOODRUSH; COMMON	JUNCACEAE	PNGL	FACU
LUZULA PARVIFLORA	LUPA4	WOODRUSH; SMALL-FLOWER	JUNCACEAE	PIGL	FAC
LYCOPODIUM ANNOTINUM	LYAN2	CLUBMOSS; STIFF	LYCOPODIACEAE	PNC	FAC
LYCOPODIUM CLAVATUM	LYCL	PINE; RUNNING	LYCOPODIACEAE	PNC	FAC
LYCOPODIUM COMPLANATUM	LYCO3	CLUBMOSS; TRAILING	LYCOPODIACEAE	PNC	FACU+

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU'' ↔ FAC' ↔ FAC'' ↔ FACW ↔ FACW' ↔ FACW'' ↔ OBL}

Species					
Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
LYCOPODIUM DENDROIDEUM	LYDE	CLUBMOSS; TREE-LIKE	LYCOPODIACEAE	C	FAC
LYCOPODIUM INUNDATUM	LYIN	CLUBMOSS; NORTHERN BOG	LYCOPODIACEAE	ANC	OBL
LYCOPODIUM LUCIDULUM	LYLU	CLUBMOSS; SHINING	LYCOPODIACEAE	PNC	FAC+
LYCOPODIUM OBSCURUM	LYOB	CLUBMOSS; TREE	LYCOPODIACEAE	PNC	FACU
LYCOPODIUM POROPHILUM	LYPO	CLUBMOSS; ROCK	LYCOPODIACEAE	PNC	FACU-
LYCOPODIUM SELAGO	LYSE	CLUBMOSS; FIR	LYCOPODIACEAE	PNC	FACU-
LYCOPUS AMERICANUS	LYAM	BUGLEWEED; AMERICAN	LAMIACEAE	PNF	OBL
LYCOPUS ASPER	LYAS	BUGLEWEED; ROUGH	LAMIACEAE	PNEF	OBL
LYCOPUS RUBELLUS	LYRU	BUGLEWEED; TAPER-LEAF	LAMIACEAE	PNEF	OBL
LYCOPUS UNIFLORUS	LYUN	BUGLEWEED; NORTHERN	LAMIACEAE	PNF	OBL
LYCOPUS VIRGINICUS	LYVI	BUGLEWEED; VIRGINIA	LAMIACEAE	PNF	OBL
LYSIMACHIA CILIATA	LYCI	LOOSESTRIFE; FRINGED	PRIMULACEAE	PNF	FACW
LYSIMACHIA HYBRIDA	LYHY	LOOSESTRIFE; LOWLAND	PRIMULACEAE	PNF	OBL
LYSIMACHIA LANCEOLATA	LYLA	LOOSESTRIFE; LANCE-LEAF	PRIMULACEAE	PNF	FAC
LYSIMACHIA NUMMULARIA	LYNU	JENNIE; CREEPING	PRIMULACEAE	PIF	FACW+
LYSIMACHIA QUADRIFLORA	LYQU	LOOSESTRIFE; FOUR-FLOWER	PRIMULACEAE	PNF	OBL
LYSIMACHIA QUADRIFOLIA	LYQU2	LOOSESTRIFE; WHORLED	PRIMULACEAE	PNF	UPL*
LYSIMACHIA TERRESTRIS	LYTE2	LOOSESTRIFE; SWAMP	PRIMULACEAE	PNF	OBL
LYSIMACHIA THYRSIFLORA	LYTH2	LOOSESTRIFE; TUFTED	PRIMULACEAE	PIF	OBL
LYSIMACHIA VERTICILLATA	LYVE?	LOOSESTRIFE	PRIMULACEAE	PNF	OBL
LYTHRUM ALATUM	LYAL4	LOOSESTRIFE; WINGED	LYTHRACEAE	PNH	OBL
LYTHRUM SALICARIA	LYSA2	LOOSESTRIFE; PURPLE	LYTHRACEAE	PIF	OBL
MADIA GLOMERATA	MAGL2	TARWEED; MOUNTAIN	ASTERACEAE	ANF	FACU
MAIANTHEMUM CANADENSE	MACA4	WILD-LILY-OF-THE-VALLEY	LILIACEAE	PNF	FAC
MALAXIS MONOPHYLLOS	MAMO	ADDER'S-MOUTH; WHITE	ORCHIDACEAE	PNF	FACW
MALAXIS PALUDOSA	MAPA4	ADDER'S-MOUTH; BOG	ORCHIDACEAE	PNF	OBL
MALAXIS UNIFOLIA	MAUN	ADDER'S-MOUTH; GREEN	ORCHIDACEAE	PNF	FAC
MARRUBIUM VULGARE	MAVU	HOREHOUND; COMMON	LAMIACEAE	PIF	FAC
MARSILEA VESTITA	MAVE2	FERN; HAIRY WATER	MARSILEACEAE	PNEP3	OBL
MATRICARIA MARITIMA	MAMA10	MAYWEED; FALSE	ASTERACEAE	AIF	FAC
MATRICARIA MATRICARIOIDES	MAMA11	PINEAPPLE-WEED	ASTERACEAE	ANF	FACU
MATRICARIA PERFORATA	MAPE2	MAYWEED; SCENTLESS	ASTERACEAE	N	UPL*
MATTEUCCIA STRUTHIOPTERIS	MAST	FERN; OSTRICH	ASPLENIACEAE	PNF3	FACW
MEDICAGO LUPULINA	MELU	MEDIC; BLACK	FABACEAE	AIF	FAC-
MEGALODONTA BECKII	MEBE2	WATER-MARIGOLD; BECK'S	ASTERACEAE	PNZF	OBL
MELAMPYRUM LINEARE	MELI2	COW-WHEAT; AMERICAN	SCROPHULARIACEAE	AIF	FAC-
MELILOTUS ALBA	MEAL2	SWEETCLOVER; WHITE	FABACEAE	ABIF	FACU
MELILOTUS INDICA	MEIN2	SWEETCLOVER; INDIAN	FABACEAE	AIF	FACU
MELILOTUS OFFICINALIS	MEOF	SWEETCLOVER; YELLOW	FABACEAE	ABIF	FACU
MENISPERMUM CANADENSE	MECA3	MOONSEED; CANADA	MENISPERMACEAE	NWV	FAC*
MENTHA ARVENSIS	MEAR4	MINT; FIELD	LAMIACEAE	PNF	FACW
MENTHA CARDIACA	MECA4	MINT; SMALL-LEAF	LAMIACEAE	PIF	OBL
MENTHA SPICATA	MESP3	SPEARMINT	LAMIACEAE	PIF	FACW+
MENYANTHES TRIFOLIATA	METR3	BUCKBEAN	MENYANTHACEAE	PNEF	OBL
MERTENSIA PANICULATA	MEPA	BLUEBELLS; TALL	BORAGINACEAE	PNF	FAC
MERTENSIA VIRGINICA	MEVI3	BLUEBELLS; VIRGINIA	BORAGINACEAE	PNF	FACW
MIMULUS GLABRATUS	MIGL	MONKEY-FLOWER; ROUND-LEAF	SCROPHULARIACEAE	PNEF	OBL
MIMULUS RINGENS	MIRI	MONKEY-FLOWER; ALLEGHANY	SCROPHULARIACEAE	PNF	OBL
MINUARTIA PATULA	MIPA6	STITCHWORT; PITCHER'S	CARYOPHYLLACEAE	ANF	UPL

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU'' ↔ FAC' ↔ FAC'' ↔ FAC' ↔ FACW ↔ FACW' ↔ FACW'' ↔ OBL}

Species Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
MIRABILIS NYCTAGINEA	MINY	FOUR-O'CLOCK; HEART-LEAF	NYCTAGINACEAE	PNF	UPL*
MISCANTHUS SINENSIS	MISI	GRASS; CHINESE SILVER	POACEAE	PIG	UPL
MITCHELLA REPENS	MIRE	PARTRIDGE-BERRY	RUBIACEAE	PNF	FACU+
MITELLA DIPHYLLA	MIDI3	BISHOP'S-CAP; TWO-LEAF	SAXIFRAGACEAE	PNF	FACU+
MITELLA NUDA	MINU3	BISHOP'S-CAP; NAKED	SAXIFRAGACEAE	PNF	FACW
MOEHRINGIA LATERIFLORA	MOLA6	SANDWORT; GROVE	CARYOPHYLLACEAE	PNF	FACU*
MOLLUGO VERTICILLATA	MOVE	CARPET-WEED; GREEN	AIZOACEAE	ANF	FAC
MONARDA FISTULOSA	MOFI	BERGAMOT; WILD	LAMIACEAE	PNF	FACU
MONARDA PUNCTATA	MOPU	BEEBALM; SPOTTED	LAMIACEAE	ABPNF	UPL
MONOLEPIS NUTTALLIANA	MONU	POVERTY-WEED; NUTTALL'S	CHENOPODIACEAE	ANF	UPL
MONOTROPA UNIFLORA	MOUN3	INDIAN-PIPE	PYROLACEAE	PN-\$F	FACU
MONTIA CHAMISSOI	MOCH	MINER'S-LETTUCE; CHAMISSO'S	PORTULACACEAE	PNEF	OBL
MORUS ALBA	MOAL	MULBERRY; WHITE	MORACEAE	IT	FAC
MORUS RUBRA	MORU2	MULBERRY; RED	MORACEAE	NT	FAC-
MUHLENBERGIA ASPERIFOLIA	MUAS	MUHLY; ALKALI	POACEAE	PNG	FACW
MUHLENBERGIA FRONDOSA	MUFR2	MUHLY; WIRE-STEM	POACEAE	PNG	FACW
MUHLENBERGIA GLOMERATA	MUGL3	MUHLY; MARSH	POACEAE	PNG	FACW+
MUHLENBERGIA MEXICANA	MUME2	MUHLY; MEXICAN	POACEAE	PNG	FACW
MUHLENBERGIA RACEMOSA	MURA	MUHLY; GREEN	POACEAE	PNG	FACW
MUHLENBERGIA RICHARDSONIS	MURI	MUHLY; MAT	POACEAE	PNG	FAC+
MUHLENBERGIA SCHREBERI	MUSC	NIMBLE-WILL	POACEAE	PNG	FAC
MUHLENBERGIA SYLVATICA	MUSY	MUHLY; FOREST	POACEAE	PNG	FACW
MUHLENBERGIA UNIFLORA	MUUN	MUHLY; BOG	POACEAE	PNG	OBL
MYOSOTIS ARVENSIS	MYAR	FORGET-ME-NOT; FIELD	BORAGINACEAE	AIF	FAC
MYOSOTIS LAXA	MYLA	FORGET-ME-NOT; BAY	BORAGINACEAE	PNF	OBL
MYOSOTIS SCORPIOIDES	MYSC	FORGET-ME-NOT; TRUE	BORAGINACEAE	PIF	OBL
MYOSOTIS SYLVATICA	MYSY	FORGET-ME-NOT; WOODLAND	BORAGINACEAE	PIF	NI
MYOSOTIS VERNA	MYVE	FORGET-ME-NOT; SPRING	BORAGINACEAE	AIF	FAC-
MYOSOTON AQUATICUM	MYAQ	CHICKWEED; GIANT	CARYOPHYLLACEAE	PIF	FAC+
MYOSURUS MINIMUS	MYMI2	MOUSE-TAIL; TINY	RANUNCULACEAE	ANF	FACW
MYRICA GALE	MYGA	SWEETGALE	MYRICACEAE	NS	OBL
MYRIOPHYLLUM ALTERNIFLORUM	MYAL3	WATER-MILFOIL; ALTERNATE-FLOWER	HALORAGIDACEAE	PZF	OBL
MYRIOPHYLLUM FARWELLII	MYFA2	WATER-MILFOIL; FARWELL'S	HALORAGIDACEAE	PNZF	OBL
MYRIOPHYLLUM HETEROPHYLLUM	MYHE2	WATER-MILFOIL; TWO-LEAF	HALORAGIDACEAE	PNZF	OBL
MYRIOPHYLLUM SPICATUM	MYSP2	WATER-MILFOIL; EURASIAN	HALORAGIDACEAE	PNZF	OBL
MYRIOPHYLLUM TENELLUM	MYTE	WATER-MILFOIL; SLENDER	HALORAGIDACEAE	PNZF	OBL
MYRIOPHYLLUM VERTICILLATUM	MYVE3	WATER-MILFOIL; WHORLED	HALORAGIDACEAE	PNZF	OBL
NAJAS FLEXILIS	NAFL	NAIAD; SLENDER	NAJADACEAE	ANZF	OBL
NAJAS GRACILLIMA	NAGR	NAIAD; THREAD-LIKE	NAJADACEAE	ANZF	OBL
NAJAS GUADALUPENSIS	NAGU	NAIAD; SOUTHERN	NAJADACEAE	ANZF	OBL
NAJAS MARINA	NAMA	NAIAD; SPINY	NAJADACEAE	ANZF	OBL
NAPAEA DIOICA	NADI2	MALLOW; GLADE	MALVACEAE	PNF	FACW-
NASTURTIUM MICROPHYLLUM	NAMI2	WATER-CRESS; ONE-ROW	BRASSICACEAE	PIZEF	OBL
NASTURTIUM OFFICINALE	NAOF	WATER-CRESS; TRUE	BRASSICACEAE	PIZEF	OBL
NELUMBO LUTEA	NELU	LOTUS; AMERICAN	NYMPHAEACEAE	PNZ/F	OBL
NEMOPANTHUS MUCRONATUS	NEMU2	CATBERRY	AQUIFOLIACEAE	NS	OBL
NEPETA CATARIA	NECA2	CATNIP	LAMIACEAE	PIF	FAC-

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FAC' ↔ FAC ↔ FACW ↔ FACW' ↔ FACW' ↔ OBL}

Species Indicator					
Scientific Name	Abrev.	Common Name	Family	Habit	Status
NUPHAR LUTEUM	NULU	COW-LILY; YELLOW	NYMPHAEACEAE	PNZF	OBL
NYMPHAEA ODORATA	NYOD	WATER-LILY; WHITE	NYMPHAEACEAE	PNZF	OBL
NYMPHAEA TETRAGONA	NYTE	WATER-LILY; PYGMY	NYMPHAEACEAE	PNZF	OBL
NYMPHAEA TUBEROSA	NYTU	WATER-LILY; WHITE	NYMPHAEACEAE	PNZF	OBL
NYMPHOIDES CORDATA	NYCO	FLOATING-HEART; LITTLE	MENYANTHACEAE	PNZF	NI
OENOTHERA BIENNIS	OEBI	EVENING-PRIMROSE; COMMON	ONAGRACEAE	BIF	FACU
OENOTHERA LACINIATA	OELA	EVENING-PRIMROSE; CUT-LEAF	ONAGRACEAE	ANF	FACU
OENOTHERA PARVIFLORA	OEP A5	EVENING-PRIMROSE; NORTHERN	ONAGRACEAE	BIF	FACU
OENOTHERA PERENNIS	OEPE	EVENING-PRIMROSE; SMALL	ONAGRACEAE	PNF	FAC
OENOTHERA RHOMBIPETALA	OERH	EVENING-PRIMROSE; FOUR-POINT	ONAGRACEAE	ABNF	FACU
OENOTHERA VILLOSA	OEVI	EVENING-PRIMROSE; HAIRY	ONAGRACEAE	BPNF	FAC
ONOCLEA SENSIBILIS	ONSE	FERN; SENSITIVE	ASPLENIACEAE	PNEF3	FACW
OPHIOGLOSSUM VULGATUM	OPVU	ADDER'S-TONGUE; NORTHERN	OPHIOGLOSSACEAE	PNF3	FACW
OROBANCHE UNIFLORA	ORUN	BROOMRAPE; ONE-FLOWER	OROBANCHACEAE	AN-F	UPL
ORTHOCARPUS LUTEUS	ORLU2	OWLS-CLOVER; YELLOW	SCROPHULARIACEAE	AN+F	FACU
ORYZOPSIS HYMENOIDES	ORHY	RICEGRASS; INDIAN	POACEAE	PNG	FACU+
OSMORHIZA CLAYTONII	OSCL	SWEETCICELY; HAIRY	APIACEAE	PNF	FACU-
OSMORHIZA LONGISTYLIS	OSLO	SWEETCICELY; SMOOTHER	APIACEAE	PNF	FACU-
OSMUNDA CINNAMOMEA	OSCI	FERN; CINNAMON	OSMUNDACEAE	PNEF3	FACW
OSMUNDA CLAYTONIANA	OSCL2	FERN; INTERRUPTED	OSMUNDACEAE	PNF3	FAC+
OSMUNDA REGALIS	OSRE	FERN; ROYAL	OSMUNDACEAE	PNF3	OBL
OSTRYA VIRGINIANA	OSVI	HOP-HORNBEAM; EASTERN	BETULACEAE	NT	FACU-
OXALIS EUROPAEA	OXEU?	WOODSORREL; UPRIGHT YELLOW	OXALIDACEAE	PIF	FACU
OXALIS MONTANA	OXMO	WOODSORREL; WHITE	OXALIDACEAE	PNF	FACU*
OXYPOLIS RIGIDIOR	OXRI	COWBANE; STIFF	APIACEAE	PNF	OBL
OXYTROPIS LAMBERTII	OXLA3	CRAZY-WEED; LAMBERT'S	FABACEAE	PNF	FACU-
OXYTROPIS SPLENDENS	OXSP	CRAZY-WEED; SHOWY	FABACEAE	PNF	FACU-
PANICUM CAPILLARE	PACA6	WITCHGRASS	POACEAE	ANG	FAC
PANICUM DICHOTOMIFLORUM	PADI	GRASS; FALL PANIC	POACEAE	ANG	FACW-
PANICUM GATTINGERI	PAGA	GRASS; GATTINGER PANIC	POACEAE	ANG	FAC
PANICUM TUCKERMANII	PATU	GRASS; TUCKERMAN PANIC	POACEAE	ANG	FACW
PANICUM VIRGATUM	PAVI2	SWITCHGRASS	POACEAE	PNG	FAC+
PARJETARIA PENNSYLVANICA	PAPE5	PELLITORY; PENNSYLVANIA	URTICACEAE	ANF	FACU
PARNASSIA GLAUCA	PAGL3	GRASS-OF-PARNASSUS; WAXY	SAXIFRAGACEAE	PNF	OBL
PARNASSIA PALUSTRIS	PAPA8	GRASS-OF-PARNASSUS; NORTHERN	SAXIFRAGACEAE	PNF	OBL
PARTHENOCISSUS QUINQUEFOLIA	PAQU2	CREEPER; VIRGINIA	VITACEAE	NWV	FAC-
PARTHENOCISSUS VITACEA	PAVI5	CREEPER; THICKET	VITACEAE	NWV	FACU
PASPALUM SETACEUM	PASE5	PASPALUM; THIN	POACEAE	PNG	FAC
PEDICULARIS CANADENSIS	PECA	LOUSEWORT; EARLY WOOD	SCROPHULARIACEAE	PNF	FACU+
PEDICULARIS LANCEOLATA	PELA2	LOUSEWORT; SWAMP	SCROPHULARIACEAE	PNF	FACW+
PENSTEMON DIGITALIS	PEDI	BEARDTONGUE; FOXGLOVE	SCROPHULARIACEAE	PNF	FAC-
PENSTEMON GRACILIS	PEGR5	BEARDTONGUE; SLENDER	SCROPHULARIACEAE	PNF	UPL
PENSTEMON PALLIDUS	PEPA7	BEARDTONGUE; PALE	SCROPHULARIACEAE	PNF	UPL
PENTHORUM SEDOIDES	PESE6	DITCH-STONECROP	CRASSULACEAE	PNF	OBL
PETASITES FRIGIDUS	PEFR5	COLTSFOOT; ARCTIC SWEET	ASTERACEAE	PNF	FACW
PETASITES PALMATUS	PEPA31	COLTSFOOT; SWEET	ASTERACEAE	PNF	FACW
PETASITES SAGITTATUS	PESA5	COLTSFOOT; ARROW-LEAF SWEET	ASTERACEAE	PNF	OBL

{Indicator status: UPL ↔ FACU\* ↔ FACU ↔ FACU\* ↔ FAC\* ↔ FAC ↔ FAC\* ↔ FACW ↔ FACW ↔ FACW\* ↔ OBL}

Species					
Indicator					
Scientific Name	Abrev.	Common Name	Family	Habit	Status
PHALARIS ARUNDINACEA	PHAR3	GRASS; REED CANARY	POACEAE	PNG	FACW+
PHALARIS CANARIENSIS	PHCA5	GRASS; COMMON CANARY	POACEAE	AIG	FACU
PHLEUM PRATENSE	PHPR3	TIMOTHY	POACEAE	PIG	FACU
PHLOX DIVARICATA	PHDI5	PHLOX; WOODLAND	POLEMONIACEAE	PNF	FACU
PHLOX MACULATA	PHMA4	PHLOX; MEADOW	POLEMONIACEAE	PNF	FACW+
PHLOX PANICULATA	PHPA9	PHLOX; FALL	POLEMONIACEAE	PNF	FACU
PHLOX PILOSA	PHPI	PHLOX; DOWNY	POLEMONIACEAE	PNF	FAC-
PHRAGMITES AUSTRALIS	PHAU7	REED; COMMON	POACEAE	PNEG	FACW+
PHRYMA LEPTOSTACHYA	PHLE5	LOPSEED; AMERICAN	VERBENACEAE	PNF	UPL*
PHYLA LANCEOLATA	PHLA3	FROG-FRUIT; LANCE-LEAF	VERBENACEAE	PNF	OBL
PHYSOCARPUS OPULIFOLIUS	PHOP	NINEBARK; EASTERN	ROSACEAE	NS	FACW-
PHYSOSTEGIA PARVIFLORA	PHPA10	DRAGON-HEAD; PURPLE	LAMIACEAE	PNF	FACW-
PHYSOSTEGIA VIRGINIANA	PHV18	DRAGON-HEAD; FALSE	LAMIACEAE	PNF	FACW
PHYTOLACCA AMERICANA	PHAM4	POKEWEED; COMMON	PHYTOLACCACEAE	PNF	FAC-
PICEA GLAUCA	PIGL	SPRUCE; WHITE	PINACEAE	NT	FACU
PICEA MARIANA	PIMA	SPRUCE; BLACK	PINACEAE	NT	FACW
PILEA FONTANA	PIFO	CLEARWEED; SPRINGS	URTICACEAE	ANF	FACW
PILEA PUMILA	PIPU2	CLEARWEED; CANADA	URTICACEAE	ANF	FACW
PINGUICULA VULGARIS	PIVU	BUTTERWORT; COMMON	LENTIBULARIACEAE	PNF	OBL
PINUS BANKSIANA	PIBA2	PINE; JACK	PINACEAE	NT	FACU
PINUS RESINOSA	PIRE	PINE; RED	PINACEAE	NT	FACU
PINUS STROBUS	PIST	PINE; EASTERN WHITE	PINACEAE	NT	FACU
PLAGIOBOTHRYUS SCOULERI	PLSC2	POPCORN-FLOWER; SCOULER	BORAGINACEAE	ANF	FACW*
PLANTAGO CORDATA	PLCO2	PLANTAIN; HEART-LEAF	PLANTAGINACEAE	PNF	OBL
PLANTAGO ELONGATA	PLEL	PLANTAIN; SLENDER	PLANTAGINACEAE	ANF	FACW
PLANTAGO ERIOPODA	PLER	PLANTAIN; SALINE	PLANTAGINACEAE	PNF	FAC
PLANTAGO LANCEOLATA	PLLA	PLANTAIN; ENGLISH	PLANTAGINACEAE	ABPIF	FAC
PLANTAGO MAJOR	PLMA2	PLANTAIN; COMMON	PLANTAGINACEAE	PIF	FAC+
PLANTAGO PATAGONICA	PLPA2	PLANTAIN; WOOLLY	PLANTAGINACEAE	ANF	UPL
PLANTAGO PUSILLA	PLPU	PLANTAIN; DWARF	PLANTAGINACEAE	ANF	FACU
PLANTAGO RUGELII	PLRU	PLANTAIN; BLACK-SEED	PLANTAGINACEAE	PNF	FAC
PLANTAGO VIRGINICA	PLVI	PLANTAIN; PALE-SEED	PLANTAGINACEAE	ANF	FACU-
PLATANThERA DILATATA	PLDI3	ORCHID; LEAFY WHITE	ORCHIDACEAE	PNF	FACW+
PLATANThERA FLAVA	PLFL	ORCHID; PALE GREEN	ORCHIDACEAE	PNF	FACW
PLATANThERA HOOKERI	PLHO3	ORCHID; HOOKER'S	ORCHIDACEAE	PNF	FAC+
PLATANThERA HYPERBOREA	PLHY2	ORCHID; NORTHERN GREEN	ORCHIDACEAE	PNF	FACW+
PLATANThERA LACINIOSA	PLLA2	ORCHID; GREEN-FRINGE	ORCHIDACEAE	PNF	FACW
PLATANThERA LEUCOPHAEA	PLLE2	ORCHID; PRAIRIE WHITE-FRINGE	ORCHIDACEAE	PNF	FACW+
PLATANThERA OBTUSATA	PLOB	BOGORCHID; SMALL NORTHERN	ORCHIDACEAE	PNF	FACW
PLATANThERA ORBICULATA	PLOR4	ORCHID; LARGE ROUND-LEAF	ORCHIDACEAE	PNF	FAC
PLATANThERA PSYCHODES	PLPS2	ORCHID; SMALL PURPLE-FRINGE	ORCHIDACEAE	PNF	FACW
PLATANUS OCCIDENTALIS	PLOC	SYCAMORE; AMERICAN	PLATANACEAE	NT	FACW
POA ALSODES	POAL3	BLUEGRASS; GROVE	POACEAE	PNG	FACW-
POA ANGUSTIFOLIA	POAN6	BLUEGRASS; BROAD-LEAF KENTUCKY	POACEAE	PIG	FACU
POA ANNUA	POAN	BLUEGRASS; ANNUAL	POACEAE	AIG	FAC-
POA ARIDA	POAR3	BLUEGRASS; PLAINS	POACEAE	PNG	NI
POA COMPRESSA	POCO	BLUEGRASS; CANADA	POACEAE	PIG	FACU+
POA GLAUCIFOLIA	POGL3	BLUEGRASS; SWALLEN'S	POACEAE	PNG	FACW
POA NEMORALIS	PONE	BLUEGRASS; WOODS	POACEAE	PNG	FAC
POA PALUDIGENA	POPA	BLUEGRASS; BOG	POACEAE	PNG	OBL
POA PALUSTRIS	POPA2	BLUEGRASS; FOWL	POACEAE	PNG	FACW+
POA PRATENSIS	POPR	BLUEGRASS; KENTUCKY	POACEAE	PNG	FAC-
POA SYLVESTRIS	POSY	BLUEGRASS; WOODLAND	POACEAE	PNG	FAC

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FAC' ↔ FAC ↔ FAC' ↔ FACW ↔ FACW' ↔ OBL}

Species					
Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
POA TRIVIALIS	POTR2	BLUEGRASS; ROUGH	POACEAE	PIG	FACW
PODOPHYLLUM PELTATUM	POPE	MAY-APPLE	BERBERIDACEAE	PNF	FACU
PODOSTEMUM CERATOPHYLLUM	POCE3	RIVERWEED; HORN-LEAF	PODOSTEMACEAE	PNZF	OBL
POGONIA OPHIOGLOSSOIDES	POOP	POGONIA; ROSE	ORCHIDACEAE	PNEF	OBL
POLANISIA DODECANDRA	PODO3	CLAMMY-WEED; ROUGH-SEED	CAPPARIDACEAE	ANF	UPL*
POLEMONIUM ACUTIFLORUM	POAC	JACOB'S-LADDER; STICKY TALL	POLEMONIACEAE	PNF	NI
POLEMONIUM REPTANS	PORE2	VALERIAN; GREEK	POLEMONIACEAE	PNF	FAC
POLYGALA CRUCIATA	POCR	MILKWORT; CROSS-LEAF	POLYGALACEAE	ANF	FACW+
POLYGALA PAUCIFOLIA	POPA5	GAY-WINGS	POLYGALACEAE	PNF	FACU
POLYGALA POLYGAMA	POPO	MILKWORT; RACEMED	POLYGALACEAE	BNF	FACU-
POLYGALA SANGUINEA	POSA3	MILKWORT; RED	POLYGALACEAE	ANF	FACU
POLYGALA SENEGA	POSE3	SNAKEROOT; SENECA	POLYGALACEAE	PNF	FACU
POLYGALA VERTICILLATA	POVE	MILKWORT; WHORLED	POLYGALACEAE	ANF	UPL
POLYGONATUM BIFLORUM	POBI2	SOLOMON'S-SEAL; SMALL	LILIACEAE	PNF	FACU
POLYGONATUM COMMUTATUM	POCO7	SOLOMON'S-SEAL; GREAT	LILIACEAE	PNF	FACU
POLYGONUM ACHOREUM	POAC3	KNOTWEED; LEATHERY	POLYGONACEAE	ANF	FAC
POLYGONUM AMPHIBIUM	POAM8	SMARTWEED; WATER	POLYGONACEAE	PNE/F	OBL
POLYGONUM ARIFOLIUM	POAR6	TEARTHUMB; HALBERD-LEAF	POLYGONACEAE	ANEF	OBL
POLYGONUM AVICULARE	POAV	KNOTWEED; PROSTRATE	POLYGONACEAE	APIF	FAC-
POLYGONUM CAREYI	POCA8	SMARTWEED; CAREY'S	POLYGONACEAE	ANF	FACW+
POLYGONUM CONVOLVULUS	POCO10	BINDWEED; BLACK	POLYGONACEAE	AIVF	FAC-
POLYGONUM CUSPIDATUM	POCU6	KNOTWEED; JAPANESE	POLYGONACEAE	PIF	FACU
POLYGONUM DOUGLASII	PODO4	KNOTWEED; DOUGLAS'	POLYGONACEAE	ANF	FACU
POLYGONUM ERECTUM	POER2	KNOTWEED; ERECT	POLYGONACEAE	ANEF	FACU
POLYGONUM HYDROPIPER	POHY	SMARTWEED; MARSHPEPPER	POLYGONACEAE	AIEF	OBL
POLYGONUM HYDROPIPEROIDES	POHY2	SMARTWEED; SWAMP	POLYGONACEAE	PNEF	OBL
POLYGONUM LAPATHIFOLIUM	POLA4	WILLOW-WEED	POLYGONACEAE	ANF	FACW+
POLYGONUM PENNSYLVANICUM	POPE2	SMARTWEED; PENNSYLVANIA	POLYGONACEAE	ANEF	FACW+
POLYGONUM PERSICARIA	POPE3	THUMB; LADY'S	POLYGONACEAE	AIF	FACW
POLYGONUM PUNCTATUM	POPU5	SMARTWEED; DOTTED	POLYGONACEAE	PNEF	OBL
POLYGONUM RAMOSISSIMUM	PORA3	KNOTWEED; BUSHY	POLYGONACEAE	ANF	FAC-
POLYGONUM SAGITTATUM	POSA5	TEARTHUMB; ARROW-LEAF	POLYGONACEAE	APNF	OBL
POLYGONUM SCANDENS	POSC3	FALSE-BUCKWHEAT; CLIMBING	POLYGONACEAE	PNV	FAC
POLYGONUM VIRGINIANUM	POVI2	KNOTWEED; VIRGINIA	POLYGONACEAE	APNF	FAC
POLYGONUM VIVIPARUM	POVI3	KNOTWEED; VIVIPAROUS	POLYGONACEAE	PNF	FACW
POLYSTICHUM ACROSTICHOIDES	POAC4	FERN; CHRISTMAS	ASPLENIACEAE	PNF3	UPL
PONTEDERIA CORDATA	POCO14	WEED; PICKEREL	PONTEDERIACEAE	PNEF	OBL
POPULUS BALSAMIFERA	POBA2	POPLAR; BALSAM	SALICACEAE	NT	FACW
POPULUS DELTOIDES	PODE3	COTTON-WOOD; EASTERN	SALICACEAE	NT	FAC+
POPULUS GRANDIDENTATA	POGR4	ASPEN; BIG-TOOTH	SALICACEAE	NT	FACU
POPULUS TREMULA	POTR10	ASPEN; QUAKING	SALICACEAE	IT	FAC
PORTULACA OLERACEA	POOL	PURSLANE; COMMON	PORTULACACEAE	ANSF	FAC-
POTAMOGETON ALPINUS	POAL8	PONDWEED; ALPINE	POTAMOGETONACEAE	PNF	OBL
POTAMOGETON AMPLIFOLIUS	POAM5	PONDWEED; LARGE-LEAF	POTAMOGETONACEAE	PNF	OBL
POTAMOGETON CRISPUS	POCR3	PONDWEED; CURLY	POTAMOGETONACEAE	PIZF	OBL
POTAMOGETON DIVERSIFOLIUS	PODI	PONDWEED; WATER-THREAD	POTAMOGETONACEAE	PNF	OBL
POTAMOGETON EPIHYDRUS	POEP2	PONDWEED; RIBBON-LEAF	POTAMOGETONACEAE	PNF	OBL
POTAMOGETON FILIFORMIS	POFI2	PONDWEED; FINE-LEAF	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON FOLIOSUS	POFO3	PONDWEED; LEAFY	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON FRIESII	POFR3	PONDWEED; FRIES'S	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON GRAMINEUS	POGR8	PONDWEED; GRASSY	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON ILLINOENSIS	POIL	PONDWEED; ILLINOIS	POTAMOGETONACEAE	PNF	OBL
POTAMOGETON LATERALIS	POLA5	PONDWEED; OPPOSITE-LEAF	POTAMOGETONACEAE	PNF	OBL
POTAMOGETON NATANS	PONA4	PONDWEED; FLOATING-LEAF	POTAMOGETONACEAE	PNF	OBL
POTAMOGETON NODOSUS	PONO2	PONDWEED; LONG-LEAF	POTAMOGETONACEAE	PNF	OBL
POTAMOGETON OBTUSIFOLIUS	POOB2	PONDWEED; BLUNT-LEAF	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON PECTINATUS	POPE6	PONDWEED; SAGO	POTAMOGETONACEAE	PNZF	OBL

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FAC' ↔ FAC ↔ FAC' ↔ FACW ↔ FACW' ↔ FACW' ↔ OBL}

Species					
Indicator					
Scientific Name	Abrev.	Common Name	Family	Habit	Status
POTAMOGETON PERFOLIATUS	POPE7	PONDWEED; CLASPING-LEAF	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON PRAELONGUS	POPR5	PONDWEED; WHITE-STEM	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON PULCHER	POPU6	PONDWEED; SPOTTED	POTAMOGETONACEAE	PN/F	OBL
POTAMOGETON PUSILLUS	POPU7	PONDWEED; SMALL	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON RICHARDSONII	PORI2	PONDWEED; RICHARDSON	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON ROBBINSII	PORO2	PONDWEED; ROBBIN'S	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON SPIRILLUS	POSP3	PONDWEED; SPIRAL	POTAMOGETONACEAE	PN/F	OBL
POTAMOGETON STRICTIFOLIUS	POST2	PONDWEED; NARROW-LEAF	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON VAGINATUS	POVA2	PONDWEED; SHEATHED	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON VASEYI	POVA3	PONDWEED; VASEY'S	POTAMOGETONACEAE	PN/F	OBL
POTAMOGETON X LONGILIGULATUS	POLO6	PONDWEED; LONG-TONGUE	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON X SPATHULIFORMIS	POSP4	PONDWEED	POTAMOGETONACEAE	PNZF	OBL
POTAMOGETON ZOSTERIFORMIS	POZO	PONDWEED; FLAT-STEM	POTAMOGETONACEAE	PNZF	OBL
POTENTILLA ANSERINA	POAN5	SILVERWEED	ROSACEAE	PNF	FACW+
POTENTILLA ARGENTEA	POAR8	CINQUEFOIL; SILVER	ROSACEAE	PIF	FACU
POTENTILLA ARGUTA	POAR7	CINQUEFOIL; TALL	ROSACEAE	PNF	FACU-
POTENTILLA FRUTICOSA	POFR4	CINQUEFOIL; SHRUBBY	ROSACEAE	NS	FACW
POTENTILLA GRACILIS	POGR9	CINQUEFOIL; NORTHWEST	ROSACEAE	PNF	FAC
POTENTILLA MILLEGRANA	POMI6	CINQUEFOIL; DIFFUSE	ROSACEAE	ABNF	OBL
POTENTILLA NICOLLETHI	PONI3	CINQUEFOIL; NICOLLET'S	ROSACEAE	ABPNF	FAC+*
POTENTILLA NORVEGICA	PONO3	CINQUEFOIL; NORWEGIAN	ROSACEAE	ABPNF	FAC
POTENTILLA PALUSTRIS	POPA14	CINQUEFOIL; MARSH	ROSACEAE	PNF	OBL
POTENTILLA PARADOXA	POPA15	CINQUEFOIL; BUSHY	ROSACEAE	ABPNF	FACW+
POTENTILLA PENTANDRA	POPE12	CINQUEFOIL; FIVE-STAMEN	ROSACEAE	PNF	FACW+
POTENTILLA RIVALIS	POR13	CINQUEFOIL; BROOK	ROSACEAE	ANF	FACW+
POTENTILLA SIMPLEX	POSI2	CINQUEFOIL; OLD FIELD	ROSACEAE	PNF	FACU-
PRENANTHES ALBA	PRAL2	RATTLESNAKE-ROOT; WHITE	ASTERACEAE	PNF	FACU
PRENANTHES CREPIDINEA	PRCR	RATTLESNAKE-ROOT; NODDING	ASTERACEAE	PNF	FAC+
PRENANTHES RACEMOSA	PRRA	RATTLESNAKE-ROOT; GLAUCCOUS	ASTERACEAE	PNF	FACW
PRIMULA MISTASSINICA	PRMI	PRIMROSE; MISTASSINI	PRIMULACEAE	PNF	FACW
PROBOSCIDEA LOUISIANICA	PRLO	UNICORN-PLANT; LOUISIANA	MARTYNIACEAE	ANF	FAC+
PROSERPINACA PALUSTRIS	PRPA3	MERMAID-WEED; MARSH	HALORAGIDACEAE	PNEZF	OBL
PRUNELLA VULGARIS	PRVU	HEAL-ALL	LAMIACEAE	PIF	FAC
PRUNUS AMERICANA	PRAM	PLUM; AMERICAN	ROSACEAE	NST	UPL
PRUNUS NIGRA	PRNI	PLUM; CANADA	ROSACEAE	NT	FACU-
PRUNUS PENNSYLVANICA	PRPE2	CHERRY; FIRE	ROSACEAE	NST	FACU-*
PRUNUS SEROTINA	PRSE2	CHERRY; BLACK	ROSACEAE	NT	FACU
PRUNUS VIRGINIANA	PRVI	CHERRY; CHOKE	ROSACEAE	NST	FAC-
PTELEA TRIFOLIATA	PTTR	WAFER-ASH	RUTACEAE	NST	FACU+
PTERIDIUM AQUILINUM	PTAQ	FERN; BRACKEN	DENNSTAEDTIACEAE	PNF3	FACU
PUCCINELLIA AIROIDES	PUAI	GRASS; NUTTALL ALKALI	POACEAE	PNG	OBL
PUCCINELLIA DISTANS	PUDI	GRASS; WEEPING ALKALI	POACEAE	PIG	OBL
PUCCINELLIA FERNALDII	PUFE	GRASS; FERNALD ALKALI	POACEAE	PNEG	OBL
PUCCINELLIA NUTTALLIANA	PUNU2	GRASS; NUTTALL'S ALKALI	POACEAE	PNG	OBL
PUCCINELLIA PALLIDA	PUPA2	GRASS; PALE MANNA	POACEAE	PNG	OBL
PYCNANTHEMUM TENUIFOLIUM	PYTE	MOUNTAIN-MINT; SLENDER	LAMIACEAE	PNF	FAC
PYCNANTHEMUM VIRGINIANUM	PYVI	MOUNTAIN-MINT; VIRGINIA	LAMIACEAE	PNF	FACW+
PYROLA ASARIFOLIA	PYAS	WINTERGREEN; PINK	PYROLACEAE	PNF	FACW*
PYROLA CHLORANTHA	PYCH	WINTERGREEN; GREENISH-FLOWER	PYROLACEAE	PNF	FACU
PYROLA MINOR	PYMI	WINTERGREEN; LESSER	PYROLACEAE	PNF	FAC+
PYROLA ROTUNDIFOLIA	PYRO	WINTERGREEN; ROUND-LEAF	PYROLACEAE	PNF	FAC-
PYROLA SECUNDA	PYSE	WINTERGREEN; ONE-SIDED	PYROLACEAE	PNF	FAC+
PYROLA UNIFLORA	PYUN	WINTERGREEN; ONE-FLOWERED	PYROLACEAE	PNF	FAC
QUERCUS ALBA	QUAL	OAK; WHITE	FAGACEAE	NT	FACU
QUERCUS BICOLOR	QUBI	OAK; SWAMP WHITE	FAGACEAE	NT	FACW+
QUERCUS MACROCARPA	QUMA2	OAK; BUR	FAGACEAE	NTS	FAC-
QUERCUS RUBRA	QURU	OAK; NORTHERN RED	FAGACEAE	NT	FACU

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU'' ↔ FAC' ↔ FAC' ↔ FACW ↔ FACW' ↔ FACW'' ↔ OBL}

Species					
Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
RANUNCULUS ABORTIVUS	RAAB	BUTTER-CUP; SUBALPINE	RANUNCULACEAE	BPNF	FACW-
RANUNCULUS ACRIS	RAAC3	BUTTER-CUP; TALL	RANUNCULACEAE	PIF	FACW-
RANUNCULUS AMBIGENS	RAAM	SPEARWORT; WATER-PLANTAIN	RANUNCULACEAE	PNEF	OBL
RANUNCULUS AQUATILIS	RAAQ	BUTTER-CUP; WHITE WATER	RANUNCULACEAE	PNZF	OBL
RANUNCULUS CYMBALARIA	RACY	BUTTER-CUP; SEASIDE	RANUNCULACEAE	PNEF	OBL
RANUNCULUS FASCICULARIS	RAFA	BUTTER-CUP; EARLY	RANUNCULACEAE	PNF	FACU
RANUNCULUS FLABELLARIIS	RAFL	BUTTER-CUP; YELLOW WATER	RANUNCULACEAE	PNEF	OBL
RANUNCULUS FLAMMULA	RAFL2	BUTTER-CUP; SPEARWORT	RANUNCULACEAE	PNEF	FACW
RANUNCULUS GMELINII	RAGM	BUTTER-CUP; SMALL YELLOW WATER	RANUNCULACEAE	PNEF	FACW+
RANUNCULUS LAPPONICUS	RALA	BUTTER-CUP; LAPLAND	RANUNCULACEAE	PNF	OBL
RANUNCULUS LONGIROSTRIS	RALO2	BUTTER-CUP; LONG-BEAK WATER	RANUNCULACEAE	PNZ/F	OBL
RANUNCULUS MACOUNII	RAMA2	BUTTER-CUP; MACOUN'S	RANUNCULACEAE	PNF	OBL
RANUNCULUS PENNSYLVANICUS	RAPE2	BUTTER-CUP; PENNSYLVANIA	RANUNCULACEAE	APNEF	OBL
RANUNCULUS RECURVATUS	RARE2	BUTTER-CUP; HOOKED	RANUNCULACEAE	PNF	FACW
RANUNCULUS REPENS	RARE3	BUTTER-CUP; CREEPING	RANUNCULACEAE	PIF	FAC+
RANUNCULUS SCLEERATUS	RASC3	BUTTER-CUP; CELERY-LEAF	RANUNCULACEAE	APNEF	OBL
RANUNCULUS SEPTENTRIONALIS	RASE	BUTTER-CUP; NORTHERN SWAMP	RANUNCULACEAE	PNF	FACW+
RANUNCULUS SUBRIGIDUS	RASU	BUTTER-CUP; POND	RANUNCULACEAE	PNZ/F	OBL
RANUNCULUS TRICHOPHYLLUS	RATR	WATER-CROWFOOT; WHITE	RANUNCULACEAE	PN/F	OBL
RHAMNUS ALNIFOLIA	RHAL	BUCKTHORN; ALDER-LEAF	RHAMNACEAE	NS	OBL
RHAMNUS CATHARTICA	RHCA3	BUCKTHORN; COMMON	RHAMNACEAE	IT	FACU
RHAMNUS FRANGULA	RHFR	BUCKTHORN; GLOSSY	RHAMNACEAE	IS	FAC+
RHYNCHOSPORA ALBA	RHAL3	BEAKRUSH; WHITE	CYPERACEAE	PNGL	OBL
RHYNCHOSPORA CAPILLACEA	RHCA11	BEAKRUSH; NEEDLE	CYPERACEAE	PNGL	OBL
RHYNCHOSPORA CAPITELLATA	RHCA12	BEAKRUSH; BROWINISH	CYPERACEAE	PNGL	OBL
RHYNCHOSPORA FUSCA	RHFU	BEAKRUSH; BROWN	CYPERACEAE	PNGL	OBL
RIBES AMERICANUM	RIAM2	CURRENT; WILD BLACK	SAXIFRAGACEAE	NS	FACW
RIBES GLANDULOSUM	RIGL	CURRENT; SKUNK	SAXIFRAGACEAE	NS	FACW
RIBES HIRTELLUM	RIHI	GOOSEBERRY; HAIRY-STEM	SAXIFRAGACEAE	NS	FACW
RIBES HUDSONIANUM	RIHU	CURRENT; HUDSON BAY	SAXIFRAGACEAE	NS	OBL
RIBES LACUSTRE	RILA	CURRENT; PRICKLY	SAXIFRAGACEAE	NS	FACW
RIBES ODORATUM	RIOD	CURRENT; BUFFALO	SAXIFRAGACEAE	NS	FAC-
RIBES SETOSUM	RISE2	GOOSEBERRY; BRISTLY	SAXIFRAGACEAE	NS	NI
RIBES TRISTE	RITR	CURRENT; SWAMP RED	SAXIFRAGACEAE	IS	OBL
ROBINIA PSEUDOACACIA	ROPS	LOCUST; BLACK	FABACEAE	NT	FACU-
RORIPPA AUSTRIACA	ROAU	YELLOW-CRESS; AUSTRIAN	BRASSICACEAE	PIEF	FACW-
RORIPPA PALUSTRIS	ROPA2	YELLOW-CRESS; BOG	BRASSICACEAE	ANEF	OBL
RORIPPA SESSILIFLORA	ROSE	YELLOW-CRESS; STALKLESS	BRASSICACEAE	ANEF	OBL
RORIPPA SINUATA	ROSI2	YELLOW-CRESS; SPREADING	BRASSICACEAE	PNF	FACW
RORIPPA SYLVESTRIS	ROSY	YELLOW-CRESS; CREEPING	BRASSICACEAE	PIEF	OBL
ROSA ACICULARIS	ROAC	ROSE; PRICKLY	ROSACEAE	NS	FACU
ROSA ARKANSANA	ROAR3	ROSE; PRAIRIE	ROSACEAE	NSH	NI
ROSA BLANDA	ROBL	ROSE; SMOOTH	ROSACEAE	NS	FACU
ROSA CAROLINA	ROCA4	ROSE; CAROLINA	ROSACEAE	NS	FACU-
ROSA PALUSTRIS	ROPA	ROSE; SWAMP	ROSACEAE	NS	OBL
ROSA RUGOSA	RORU	ROSE; RUGOSA	ROSACEAE	IS	FACU*
ROSA WOODSII	ROWO	ROSE; WOODS	ROSACEAE	NS	FACU
ROOTALA RAMOSIOR	RORA	TOOTH CUP	LYTHRACEAE	ANF	OBL
RUBUS ACAULIS	RUAC	RASPBERRY; DWARF	ROSACEAE	PNF	OBL
RUBUS ALLEGHENIENSIS	RUAL	BLACKBERRY; ALLEGHENY	ROSACEAE	NS	FACU+
RUBUS ALUMNUS	RUAL9	BLACKBERRY; OLD FIELD	ROSACEAE	NS	FAC-*
RUBUS ARCTICUS	RUAR	RASPBERRY; ARCTIC	ROSACEAE	IS	NI
RUBUS ARGUTUS	RUAR2	BLACKBERRY; SERRATE-LEAF	ROSACEAE	NS	FAC-*
RUBUS BAILEYANUS	RUBA2	DEWBERRY; BAILEY'S	ROSACEAE	NS	UPL
RUBUS CHAMAEMORUS	RUCH	CLOUDBERRY	ROSACEAE	PNF	NI
RUBUS FLAGELLARIIS	RUFL	DEWBERRY; NORTHERN	ROSACEAE	NS	FACU-
RUBUS IDAEUS	RUID	RASPBERRY; COMMON RED	ROSACEAE	IS	FACU+
RUBUS PARVIFLORUS	RUPA	THIMBLE-BERRY; WESTERN	ROSACEAE	NS	FACU+
RUBUS PUBESCENS	RUPU	BLACKBERRY; DWARF	ROSACEAE	PNF	FACW+
RUBUS SEMISETOSUS	RUSE3	BLACKBERRY; NEW ENGLAND	ROSACEAE	NS	NI
RUBUS SETOSUS	RUSE	BLACKBERRY; SETOSE	ROSACEAE	NS	FACW-

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU'' ↔ FAC' ↔ FAC'' ↔ FACW ↔ FACW' ↔ FACW'' ↔ OBL}

Species					
Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
RUBUS STRIGOSUS	RUST	RASPBERRY; RED	ROSACEAE	PNS	FACW-
RUBUS X GROUTIANUS	RUGR6	BRISTLEBERRY	ROSACEAE	NS	FAC+*
RUDBECKIA HIRTA	RUHI2	SUSAN; BLACK-EYED	ASTERACEAE	BPNF	FACU
RUDBECKIA LACINIATA	RULA3	CONEFLOWER; CUT-LEAF	ASTERACEAE	PNF	FACW+
RUDBECKIA TRILOBA	RUTR2	SUSAN; BROWN-EYED	ASTERACEAE	PNF	FAC-
RUPELLIA HUMILIS	RUHU	WILD-PETUNIA; HAIRY	ACANTHACEAE	PNF	FACU-
RUMEX ACETOSA	RUAC2	SORREL; GARDEN	POLYGONACEAE	PIF	UPL
RUMEX ACETOSELLA	RUAC3	SORREL; SHEEP	POLYGONACEAE	PIF	FAC
RUMEX ALTISSIMUS	RUAL4	DOCK; PALE	POLYGONACEAE	PNF	FACW-
RUMEX BRITANNICA	RUBR7	DOCK; GREAT WATER	POLYGONACEAE	F	OBL
RUMEX CRISPUS	RUCR	DOCK; CURLY	POLYGONACEAE	PIF	FAC+
RUMEX DOMESTICUS	RUDO	DOCK; DOORYARD	POLYGONACEAE	PIF	FAC*
RUMEX FUEGINUS	RUFU3	DOCK; SEA-SIDE	POLYGONACEAE	ABNF	OBL
RUMEX MARITIMUS	RUMA4	DOCK; GOLDEN	POLYGONACEAE	ABNF	FACW+
RUMEX MEXICANUS	RUME2	DOCK; MEXICAN	POLYGONACEAE	PNF	FAC+
RUMEX OBTUSIFOLIUS	RUOB	DOCK; BITTER	POLYGONACEAE	PIF	FACW
RUMEX OCCIDENTALIS	RUOC3	DOCK; WESTERN	POLYGONACEAE	PNF	OBL
RUMEX ORBICULATUS	RUOR2	DOCK; GREAT WATER	POLYGONACEAE	PNF	OBL
RUMEX STENOPHYLLUS	RUST4	DOCK; NARROW-LEAF	POLYGONACEAE	PIF	FACW*
RUMEX TRIANGULIVALVIS	RUTR3	DOCK; TRIANGULAR-VALVE	POLYGONACEAE	PNF	FACW*
RUMEX VERTICILLATUS	RUVE3	DOCK; SWAMP	POLYGONACEAE	PNF	OBL
RUPPIA MARITIMA	RUMA5	WIDGEON-GRASS	ZOSTERACEAE	PNZF	OBL
SAGINA NODOSA	SANO	PEARLWORT; KNOTTED	CARYOPHYLLACEAE	PIF	FACU+*
SAGINA PROCUMBENS	SAPR	PEARLWORT; PROCUMBENT	CARYOPHYLLACEAE	PIF	FACW
SAGITTARIA CALYCINA	SACA21	ARROW-HEAD; HOODED	ALISMACEAE	PNF	OBL
SAGITTARIA CRISTATA	SACR4	ARROW-HEAD; CRESTED	ALISMACEAE	PNF	OBL
SAGITTARIA CUNEATA	SACR	ARROW-HEAD; NORTHERN	ALISMACEAE	PNF	OBL
SAGITTARIA GRAMINEA	SAGR	ARROW-HEAD; GRASS-LEAF	ALISMACEAE	PNF	OBL
SAGITTARIA LATIFOLIA	SALA2	ARROW-HEAD; BROAD-LEAF	ALISMACEAE	PNF	OBL
SAGITTARIA RIGIDA	SARI	ARROW-HEAD; STIFF	ALISMACEAE	PNF	OBL
SALICORNIA RUBRA	SARU	SALTWORT; RED	CHENOPODIACEAE	ANSF	OBL
SALIX ALBA	SAAL2	WILLOW; WHITE	SALICACEAE	IT	FACW
SALIX AMYGDALOIDES	SAAM2	WILLOW; PEACH-LEAF	SALICACEAE	NT	FACW
SALIX BEBBIANA	SABE2	WILLOW; BEBB	SALICACEAE	NS	FACW+
SALIX CANDIDA	SACA4	WILLOW; HOARY	SALICACEAE	NS	OBL
SALIX CORDATA	SACO3	WILLOW; HEART-LEAF	SALICACEAE	NS	FAC+
SALIX DISCOLOR	SADI	WILLOW; PUSSY	SALICACEAE	NS	FACW
SALIX ERIOCEPHALA	SAER	WILLOW; MISSOURI RIVER	SALICACEAE	NS	FACW
SALIX EXIGUA	SAEX	WILLOW; SANDBAR	SALICACEAE	NS	OBL
SALIX FRAGILIS	SAFR	WILLOW; CRACK	SALICACEAE	IT	FAC+
SALIX HUMILIS	SAHU2	WILLOW; TALL PRAIRIE	SALICACEAE	NS	FACU
SALIX LUCIDA	SALU	WILLOW; SHINING	SALICACEAE	NT	FACW+
SALIX NIGRA	SANI	WILLOW; BLACK	SALICACEAE	NT	OBL
SALIX PEDICELLARIS	SAPE2	WILLOW; BOG	SALICACEAE	NS	OBL
SALIX PELLITA	SAPE3	WILLOW; SATINY	SALICACEAE	NS	FACW
SALIX PETIOLARIS	SAPE5	WILLOW; MEADOW	SALICACEAE	NS	FACW+
SALIX PLANIFOLIA	SAPL2	WILLOW; DIAMOND-LEAF	SALICACEAE	NS	OBL
SALIX PURPUREA	SAPU2	WILLOW; PURPLE-OSIER	SALICACEAE	IS	FACW*
SALIX PYRIFOLIA	SAPY	WILLOW; BALSAM	SALICACEAE	NS	FACW+
SALIX RIGIDA	SARI2	WILLOW; HEART-LEAF	SALICACEAE	NS	FACW+
SALIX SERISSIMA	SASE2	WILLOW; AUTUMN	SALICACEAE	NS	OBL
SALSOLA KALI	SAKA	THISTLE; RUSSIAN	CHENOPODIACEAE	AIF	FACU
SALSOLA PESTIFER	SAPE10	THISTLE; RUSSIAN	CHENOPODIACEAE	I	FACU
SAMBUCUS CANADENSIS	SACA12	ELDER; AMERICAN	CAPRIFOLIACEAE	NS	FACW-
SAMBUCUS RACEMOSA	SARA2	ELDER; EUROPEAN RED	CAPRIFOLIACEAE	NS	FACU+
SANGUINARIA CANADENSIS	SACA13	BLOODROOT	PAPAVERACEAE	PNF	FACU-*
SANICULA CANADENSIS	SACA15	BLACK-SNAKEROOT; CANADIAN	APIACEAE	BNF	FACU+
SANICULA GREGARIA	SAGR6	BLACK-SNAKEROOT; CLUSTERED	APIACEAE	PNF	FAC+

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU'' ↔ FAC' ↔ FAC'' ↔ FACW ↔ FACW' ↔ FACW'' ↔ OBL}

Species Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
SANICULA MARILANDICA	SAMA2	BLACK-SNAKEROOT	APIACEAE	PNF	NI
SAPONARIA OFFICINALIS	SAOF4	BOUNCING-BET	CARYOPHYLLACEAE	PIF	FACU
SARRACENIA PURPUREA	SAPU4	PITCHER-PLANT; NORTHERN	SARRACENIACEAE	PNF	OBL
SATUREJA ARKANSANA	SAAR11	SAVORY; LIMESTONE	LAMIACEAE	PNF	FACW
SAXIFRAGA AIZOON	SAAI2	SAXIFRAGE; AIZOON	SAXIFRAGACEAE	PNF	FAC
SAXIFRAGA CERNUA	SACE2	SAXIFRAGE; NODDING	SAXIFRAGACEAE	PNF	FACW
SAXIFRAGA FORBESII	SAFO2	SAXIFRAGE; FORBES	SAXIFRAGACEAE	PNF	FACU-
SAXIFRAGA PENNSYLVANICA	SAPE8	SAXIFRAGE; SWAMP	SAXIFRAGACEAE	PNF	OBL
SAXIFRAGA VIRGINIENSIS	SAVI5	SAXIFRAGE; VIRGINIA	SAXIFRAGACEAE	PNF	FAC-
SCHEUCHZERIA PALUSTRIS	SCPA2	POD-GRASS	SCHEUCHZERIAACEAE	PNEF	OBL
SCHIZACHNE PURPURASCENS	SCPU	MELIC; FALSE	POACEAE	PNG	FACU+
SCHIZACHYRIUM SCOPARIUM	SCSC	BLUESTEM; LITTLE	POACEAE	PNG	FACU-
SCIRPUS ACUTUS	SCAC	BULRUSH; HARD-STEM	CYPERACEAE	PNEGL	OBL
SCIRPUS AMERICANUS	SCAM2	BULRUSH; OLNEY'S	CYPERACEAE	PNEGL	OBL
SCIRPUS ATROCINCTUS	SCAT4	BULRUSH; BLACK-GIRDLE	CYPERACEAE	PNEGL	OBL
SCIRPUS ATROVIRENS	SCAT2	BULRUSH; GREEN	CYPERACEAE	PNEGL	OBL
SCIRPUS CESPITOSUS	SCCE2	BULRUSH; TUFTED	CYPERACEAE	PNGL	OBL
SCIRPUS CLINTONII	SCCL2	BULRUSH; CLINTON'S	CYPERACEAE	PNGL	FACU-
SCIRPUS CYPERINUS	SCCY	WOOL-GRASS	CYPERACEAE	PNEGL	OBL
SCIRPUS FLUVIATILIS	SCFL	BULRUSH; RIVER	CYPERACEAE	PNEGL	OBL
SCIRPUS GEORGIANUS	SCGE2	BULRUSH; DARK-GREEN	CYPERACEAE	PNEGL	OBL
SCIRPUS HETEROCHAETUS	SCHE	BULRUSH; SLENDER	CYPERACEAE	PNEGL	OBL
SCIRPUS MARITIMUS	SCMA	BULRUSH; SALT MARSH	CYPERACEAE	PNEGL	NI
SCIRPUS MICROCARPUS	SCMI2	BULRUSH; SMALL-FRUIT	CYPERACEAE	PNGL	OBL
SCIRPUS PALLIDUS	SCPA8	BULRUSH; CLOAKED	CYPERACEAE	PNEGL	OBL
SCIRPUS PEDICELLATUS	SCPE3	BULRUSH; STALKED	CYPERACEAE	PNEGL	OBL
SCIRPUS PURSHIANUS	SCPU4	BULRUSH; WEAK-STALK	CYPERACEAE	ANEGL	OBL
SCIRPUS SMITHII	SCSM	BULRUSH; SMITH'S	CYPERACEAE	ANEGL	OBL
SCIRPUS SUBTERMINALIS	SCSU	BULRUSH; SUBTERMINATE	CYPERACEAE	PNZGL	OBL
SCIRPUS TORREYI	SCTO	BULRUSH; TORREY'S	CYPERACEAE	PNEGL	OBL
SCIRPUS VALIDUS	SCVA	BULRUSH; SOFT-STEM	CYPERACEAE	PNEGL	OBL
SCLERANTHUS ANNUUS	SCAN2	KNAWEL; ANNUAL	CARYOPHYLLACEAE	AIF	FACU
SCLERIA TRIGLOMERATA	SCTR	NUTRUSH; WHIP	CYPERACEAE	PNGL	FAC
SCLERIA VERTICILLATA	SCVE2	NUTRUSH; LOW	CYPERACEAE	ANGL	OBL
SCOLOCHLOA FESTUCACEA	SCFE	SPRANGLE-TOP	POACEAE	PNEG	OBL
SCROPHULARIA LANCEOLATA	SCLA	FIGWORT; LANCE-LEAF	SCROPHULARIACEAE	PNF	FACU+
SCROPHULARIA MARILANDICA	SCMA2	SQUARE; CARPENTER'S	SCROPHULARIACEAE	PNF	FACU.*
SCUTELLARIA GALERICULATA	SCGA	SKULLCAP; HOODED	LAMIACEAE	PNF	OBL
SCUTELLARIA LATERIFLORA	SCLA2	SKULLCAP; BLUE	LAMIACEAE	PNF	OBL
SCUTELLARIA OVATA	SCOV	SKULLCAP; EGG-LEAF	LAMIACEAE	PNF	FACU
SCUTELLARIA PARVULA	SCPA7	SKULLCAP; SMALL	LAMIACEAE	PNF	FACU.*
SEDUM ROSEA	SERO2	STONECROP; ROSEROOT	CRASSULACEAE	PNSF	OBL
SELAGINELLA SELAGINOIDES	SESE	SPIKE-MOSS; CLUB	SELAGINELLACEAE	PNC	FACW+
SENECIO AUREUS	SEAU2	RAGWORT; GOLDEN	ASTERACEAE	PNF	FACW
SENECIO CONGESTUS	SECO2	GROUNDSEL; MARSH	ASTERACEAE	ABNF	FACW+
SENECIO INDECORUS	SEIN	GROUNDSEL; ELEGANT	ASTERACEAE	PNF	FACW*
SENECIO INTEGERRIMUS	SEIN2	GROUNDSEL; LAMBSTONGUE	ASTERACEAE	BPNF	FAC*
SENECIO PAUCIFLORUS	SEPA4	GROUNDSEL; FEW-FLOWER	ASTERACEAE	PNF	FACU.*
SENECIO PAUPERCULUS	SEPA5	GROUNDSEL; BALSAM	ASTERACEAE	PNF	FAC+
SENECIO PLATTENSIS	SEPL	GROUNDSEL; PRAIRIE	ASTERACEAE	BPNF	FACU-
SENECIO PSEUDAUREUS	SEPS2	GROUNDSEL; GOLDEN	ASTERACEAE	PNF	FACW
SENECIO VULGARIS	SEVU	GROUNDSEL; COMMON	ASTERACEAE	AIF	UPL.*
SETARIA FABERI	SEFA	GRASS; JAPANESE BRISTLE	POACEAE	AIG	FACU+

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU'' ↔ FAC' ↔ FAC' ↔ FACW ↔ FACW' ↔ FACW'' ↔ OBL}

Species Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
SETARIA GLAUCA	SEGL2	GRASS; YELLOW BRISTLE	POACEAE	AIG	FAC
SETARIA ITALICA	SEIT	GRASS; FOX-TAIL BRISTLE	POACEAE	AIG	FACU
SETARIA VERTICILLATA	SEVE3	GRASS; BUR BRISTLE	POACEAE	AIG	FAC
SHEPHERDIA CANADENSIS	SHCA	BUFFALO-BERRY; CANADA	ELAEAGNACEAE	PNS	NI
SICYOS ANGULATUS	SIAN	BUR-CUCUMBER; ONE-SEED	CUCURBITACEAE	ANF	FACW-
SILENE NIVEA	SINI	CAMPION; SNOWY	CARYOPHYLLACEAE	PNF	FACW
SILPHIUM PERFOLIATUM	SIPE2	CUP-PLANT	ASTERACEAE	PNF	FACW-
SILPHIUM TEREBINTHINACEUM	SITE	ROSIN-WEED; PRAIRIE	ASTERACEAE	PNF	FACU
SISYMBRIUM ALTISSIMUM	SIAL2	MUSTARD; TALL TUMBLE	BRASSICACEAE	ABIF	FACU
SISYRINCHIUM ANGUSTIFOLIUM	SIAN3	BLUE-EYE-GRASS; POINTED	IRIDACEAE	PNF	FACW-
SISYRINCHIUM MONTANUM	SIM02	BLUE-EYE-GRASS; STRICT	IRIDACEAE	PNF	FAC+
SISYRINCHIUM MUCRONATUM	SIMU3	BLUE-EYE-GRASS; MICHAUX'S	IRIDACEAE	PNF	FACW-
SIUM CARSONII	SICA12	WATER-PARSNIP; CARSON'S	APIACEAE	PNZ/F	OBL
SIUM SUAVE	SISU2	WATER-PARSNIP; HEMLOCK	APIACEAE	PNF	OBL
SMILACINA RACEMOSA	SMRA	FALSE-SOLOMON'S-SEAL; FEATHER	LILIACEAE	PNF	FACU
SMILACINA STELLATA	SMST	FALSE-SOLOMON'S-SEAL; STARRY	LILIACEAE	PNF	FAC-
SMILACINA TRIFOLIA	SMTR	FALSE-SOLOMON'S-SEAL; THREE-LEAF	LILIACEAE	PNF	OBL
SMILAX HERBACEA	SMHE	CARRION-FLOWER; SMOOTH	SMILACACEAE	PNVF	FAC
SMILAX HISPIDA	SMHI	GREENBRIER; BRISTLY	SMILACACEAE	NWVS	FAC
SMILAX PULVERULENTA	SMPU2	CARRION-FLOWER; DOWNY	SMILACACEAE	PNV	FACU
SOLANUM AMERICANUM	SOAM	NIGHTSHADE; BLACK	SOLANACEAE	ANF	FACU-
SOLANUM CAROLINENSE	SOCA3	NIGHTSHADE; CAROLINA	SOLANACEAE	NSF	FACU-
SOLANUM DULCAMARA	SODU	NIGHTSHADE; CLIMBING	SOLANACEAE	PIF	FAC
SOLANUM NIGRUM	SONI	NIGHTSHADE; BLACK	SOLANACEAE	AIF	FACU-
SOLIDAGO ALTISSIMA	SOAL4	GOLDEN-ROD; TALL	ASTERACEAE	PNF	FACU
SOLIDAGO CANADENSIS	SOCA6	GOLDEN-ROD; CANADA	ASTERACEAE	PNF	FACU
SOLIDAGO ELONGATA	SOEL4	GOLDEN-ROD; CREEK	ASTERACEAE	PNF	FACU
SOLIDAGO FLEXICAULIS	SOFL2	GOLDEN-ROD; ZIGZAG	ASTERACEAE	PNF	FACU
SOLIDAGO GIGANTEA	SOGI	GOLDEN-ROD; GIANT	ASTERACEAE	PNF	FACW
SOLIDAGO NUTTALLII	SONU3	GOLDEN-ROD; NUTTALL	ASTERACEAE	PNF	FAC
SOLIDAGO PATULA	SOPA2	GOLDEN-ROD; ROUGH-LEAF	ASTERACEAE	PNF	OBL
SOLIDAGO RIDDELLII	SORI	GOLDEN-ROD; RIDDELL'S	ASTERACEAE	PNF	OBL
SOLIDAGO RIGIDA	SORI2	GOLDEN-ROD; STIFF	ASTERACEAE	PNF	FACU-
SOLIDAGO SPATHULATA	SOSP	GOLDEN-ROD; COAST	ASTERACEAE	PNF	FACU
SOLIDAGO ULIGINOSA	SOUL	GOLDEN-ROD; BOG	ASTERACEAE	PNF	OBL
SONCHUS ARVENSIS	SOAR2	SOWTHISTLE; FIELD	ASTERACEAE	PIF	FAC-
SONCHUS ASPER	SOAS	SOWTHISTLE; PRICKLY	ASTERACEAE	AIF	FAC
SONCHUS OLERACEUS	SOOL	SOWTHISTLE; COMMON	ASTERACEAE	AIF	FACU
SORBUS AMERICANA	SOAM3	MOUNTAIN-ASH; AMERICAN	ROSACEAE	NT	FAC+
SORBUS DECORA	SODE3	MOUNTAIN-ASH; SHOWY	ROSACEAE	NT	UPL
SORGHASTRUM NUTANS	SONU2	GRASS; INDIAN	POACEAE	PNG	FACU+
SPARGANIUM AMERICANUM	SPAM	BURREED; AMERICAN	SPARGANIACEAE	PNF	OBL
SPARGANIUM ANDROCLADUM	SPAN	BURREED; BRANCHING	SPARGANIACEAE	PNF	OBL
SPARGANIUM CHLOROCARPUM	SPCH	BURREED; GREENFRUIT	SPARGANIACEAE	PNF	OBL
SPARGANIUM EMERSUM	SPEM2	BURREED; NARROW-LEAF	SPARGANIACEAE	PNF	OBL
SPARGANIUM EURYCARPUM	SPEU	BURREED; GIANT	SPARGANIACEAE	PNF	OBL
SPARGANIUM FLUCTUANS	SPFL	BURREED; FLOATING	SPARGANIACEAE	PNF	OBL
SPARGANIUM GLOMERATUM	SPGL	BURREED; CLUSTERED	SPARGANIACEAE	PNF	OBL
SPARGANIUM MINIMUM	SPMI	BURREED; SMALL	SPARGANIACEAE	PNF	OBL
SPARTINA GRACILIS	SPGR	CORDGRASS; ALKALI	POACEAE	PNG	NI
SPARTINA PECTINATA	SPPE	CORDGRASS; PRAIRIE	POACEAE	PNG	FACW+
SPERGULARIA RUBRA	SPRU	SANDSPURRY; PURPLE	CARYOPHYLLACEAE	AIF	FACU

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU' ↔ FAC' ↔ FAC' ↔ FACW ↔ FACW' ↔ FACW' ↔ OBL}

Species Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
SPHENOPHOLIS OBTUSATA	SPOB	WEDGEGRASS; PRAIRIE	POACEAE	APNG	FAC
SPIRAEA ALBA	SPAL2	MEADOW-SWEET; NARROW-LEAF	ROSACEAE	NS	FACW+
SPIRAEA LATIFOLIA	SPLA2	MEADOW-SWEET; BROAD-LEAF	ROSACEAE	NS	FACW-
SPIRAEA TOMENTOSA	SPTO2	STEEPLE-BUSH	ROSACEAE	NS	FACW
SPIRANTHES CERNUA	SPCE	LADIES'-TRESSES; NODDING	ORCHIDACEAE	PNF	FACW-
SPIRANTHES LACERA	SPLA4	LADIES'-TRESSES; NORTHERN SLENDER	ORCHIDACEAE	PNF	FAC+
SPIRANTHES ROMANZOFFIANA	SPRO	LADIES'-TRESSES; HOODED	ORCHIDACEAE	PNF	FACW+
SPIRODELA POLYRHIZA	SPP0	DUCKWEED; GREATER	LEMNACEAE	PI/F	OBL
SPOROBOLUS ASPER	SPAS	DROPSEED; TALL	POACEAE	PNG	UPL
SPOROBOLUS CRYPTANDRUS	SPCR	DROPSEED; SAND	POACEAE	PNG	FACU-
SPOROBOLUS HETEROLEPIS	SPHE	DROPSEED; PRAIRIE	POACEAE	PNG	FACU-
SPOROBOLUS NEGLECTUS	SPNE2	DROPSEED; PUFFSHEATH	POACEAE	ANG	UPL
SPOROBOLUS VAGINIFLORUS	SPVA	DROPSEED; POVERTY	POACEAE	ANG	UPL
STACHYS ASPERA	STAS	HEDGENETTLE; ROUGH	LAMIACEAE	ANF	FACW+
STACHYS HISPIDA	STHI	HEDGENETTLE; SMOOTH	LAMIACEAE	PNF	FACW+
STACHYS HYSSOPIFOLIA	STHY3	HEDGENETTLE; HYSSOP-LEAF	LAMIACEAE	PNF	FACW+
STACHYS PALUSTRIS	STPA	HEDGENETTLE; MARSH	LAMIACEAE	PIF	OBL
STACHYS TENUIFOLIA	STTE	HEDGENETTLE; SMOOTH	LAMIACEAE	PNF	OBL
STAPHYLEA TRIFOLIA	STTR	BLADDERNUT; AMERICAN	STAPHYLEACEAE	NST	FAC
STELLARIA ALSINE	STAL4	STARWORT; BOG	CARYOPHYLLACEAE	AIF	NI
STELLARIA CALYCANTHA	STCA	STARWORT; NORTHERN	CARYOPHYLLACEAE	PNF	OBL
STELLARIA CRASSIFOLIA	STCR	STARWORT; FLESHY	CARYOPHYLLACEAE	PNF	NI
STELLARIA GRAMINEA	STGR	STARWORT; LESSER	CARYOPHYLLACEAE	PNF	UPL
STELLARIA LAETA	STLA3	STARWORT; LONG-STALK	CARYOPHYLLACEAE	PNF	NI
STELLARIA LONGIFOLIA	STLO	STARWORT; LONG-LEAF	CARYOPHYLLACEAE	PNF	FACW+
STELLARIA LONGIPES	STLO2	STARWORT; LONG-STALK	CARYOPHYLLACEAE	PNF	OBL
STELLARIA MEDIA	STME2	CHICKWEED; COMMON	CARYOPHYLLACEAE	APIF	FACU
STREPTOPUS AMPLEXIFOLIUS	STAM2	TWISTED-STALK; CLASP-LEAF	LILLIACEAE	PNF	FAC+
STREPTOPUS ROSEUS	STRO4	TWISTED-STALK; ROSY	LILLIACEAE	PF	FAC
STROPHOSTYLES HELVOLA	STHE2	WILDBEAN; TRAILING	FABACEAE	ANVF	FAC+
SUAEDA DEPRESSA	SUDE	SEEPWEED; PURSH	CHENOPODIACEAE	APNF	FACW
SUBULARIA AQUATICA	SUAQ	AWLWORT; WATER	BRASSICACEAE	ANZF	OBL
SYMPHORICARPOS ALBUS	SYAL	SNOWBERRY	CAPRIFOLIACEAE	NS	FACU-
SYMPHORICARPOS ORBICULATUS	SYOR	CORAL-BERRY	CAPRIFOLIACEAE	NS	FACU
SYMPLOCARPUS FOETIDUS	SYFO	SKUNK-CABBAGE	ARACEAE	PNF	OBL
TARAXACUM OFFICINALE	TAOF	DANDELION; COMMON	ASTERACEAE	PIF	FACU
TAXUS CANADENSIS	TACA7	YEW; AMERICAN	TAXACEAE	NS	FACU
TEUCRIUM CANADENSE	TECA3	GERMANDER; AMERICAN	LAMIACEAE	PNEF	FACW-
THALICTRUM CONFINE	THCO	MEADOW-RUE; CRITICAL	RANUNCULACEAE	PNF	FAC*
THALICTRUM DASYCARPUM	THDA	MEADOW-RUE; PURPLE	RANUNCULACEAE	PNF	FACW-
THALICTRUM DIOICUM	THDI	MEADOW-RUE; EARLY	RANUNCULACEAE	PNF	FACU+
THASPIUM BARBINODE	THBA	MEADOW-PARSNIP; HAIRY JOINT	APIACEAE	PNF	UPL
THELYPTERIS HEXAGONOPTERA	THHE	FERN; BROAD BEECH	ASPLENIACEAE	PNF3	FAC-
THELYPTERIS THELYPTEROIDES	THTH	FERN; MARSH	ASPLENIACEAE	F3	FACW+
THLASPI ARVENSE	THAR5	PENNY-CRESS; FIELD	BRASSICACEAE	AIF	NI
THUJA OCCIDENTALIS	THOC2	CEDAR; NORTHERN WHITE	CUPRESSACEAE	NT	FACW
TILIA AMERICANA	TIAM	BASSWOOD; AMERICAN	TILIACEAE	NT	FACU

{Indicator status: UPL ↔ FACU ↔ FACU' ↔ FACU'' ↔ FAC' ↔ FAC'' ↔ FACW ↔ FACW' ↔ FACW'' ↔ OBL}

Species Indicator					
<u>Scientific Name</u>	<u>Abrev.</u>	<u>Common Name</u>	<u>Family</u>	<u>Habit</u>	<u>Status</u>
TOFIELDIA GLUTINOSA	TOGL2	FALSE-ASPHODEL; STICKY	LILIACEAE	PNF	OBL
TOFIELDIA PUSILLA	TOPU	FALSE-ASPHODEL; SCOTCH	LILIACEAE	PNF	FACW+
TOXICODENDRON RADICANS	TORA2	IVY; POISON	ANACARDIACEAE	NWVS	FAC+
TOXICODENDRON RYDBERGII	TORY	IVY; RYDBERG POISON	ANACARDIACEAE	NHS	FAC
TOXICODENDRON VERNIX	TOVE	SUMAC; POISON	ANACARDIACEAE	N	OBL
TRADESCANTIA BRACTEATA	TRBR	SPIDER-WORT; LONG-BRACT	COMMELINACEAE	PNF	FACU-
TRADESCANTIA OCCIDENTALIS	TROC	SPIDER-WORT; PRAIRIE	COMMELINACEAE	PNF	UPL
TRADESCANTIA OHIENSIS	TROH	SPIDER-WORT; OHIO	COMMELINACEAE	PNF	FACU+
TRADESCANTIA VIRGINIANA	TRVI	SPIDER-WORT; VIRGINIA	COMMELINACEAE	PNF	UPL
TRIADENUM FRASERI	TRFR	ST. JOHN'S-WORT; MARSH	CLUSIACEAE	PNEF	OBL
TRIADENUM VIRGINICUM	TRVI2	ST. JOHN'S-WORT; MARSH	CLUSIACEAE	PNEF	OBL
TRIDENS FLAVUS	TRFL2	TRIDENS; PURPLE-TOP	POACEAE	PNG	UPL
TRIENTALIS BOREALIS	TRBO2	STARFLOWER; AMERICAN	PRIMULACEAE	PNF	FAC+
TRIFOLIUM HYBRIDUM	TRHY	CLOVER; ALSIKE	FABACEAE	PIF	FAC-
TRIFOLIUM PRATENSE	TRPR2	CLOVER; RED	FABACEAE	BPIF	FACU+
TRIFOLIUM REPENS	TRRE3	CLOVER; WHITE	FABACEAE	PIF	FACU+
TRIGLOCHIN MARITIMUM	TRMA4	ARROW-GRASS; SEASIDE	SCHEUCHZERIAEAE	PNF	OBL
TRIGLOCHIN PALUSTRE	TRPA6	ARROW-GRASS; MARSH	SCHEUCHZERIAEAE	PNF	OBL
TRILLIUM CERNUUM	TRCE	TRILLIUM; NODDING	LILIACEAE	PNF	FAC
TRILLIUM FLEXIPES	TRFL6	TRILLIUM; WHITE	LILIACEAE	PNF	FAC-
TRIODANIS PERFOLIATA	TRPE4	VENUS'-LOOKING-GLASS; CLASP-LEAF	CAMPANULACEAE	ANF	FAC
TRisetum SPICATUM	TRSP2	FALSE-OATS; SPIKED	POACEAE	PNG	FAC-
ISUGA CANADENSIS	TSCA	HEMLOCK; EASTERN	PINACEAE	NT	FACU
TUSSILAGO FARFARA	TUFA	COLT'S-FOOT	ASTERACEAE	PIF	FACU
TYPHA ANGUSTIFOLIA	TYAN	CATTAIL; NARROW-LEAF	TYPHACEAE	PNEF	OBL
TYPHA LATIFOLIA	TYLA	CATTAIL; BROAD-LEAF	TYPHACEAE	PNEF	OBL
TYPHA X GLAUCA	TYGL	CATTAIL; BLUE	TYPHACEAE	PNEF	OBL
ULMUS AMERICANA	ULAM	ELM; AMERICAN	ULMACEAE	NT	FACW-
ULMUS RUBRA	ULRU	ELM; SLIPPERY	ULMACEAE	NT	FAC
ULMUS THOMASII	ULTH	ELM; ROCK	ULMACEAE	NT	FAC+
URTICA DIOICA	URDI	NETTLE; STINGING	URTICACEAE	PIF	FAC+
UTRICULARIA CORNUTA	UTCO	BLADDERWORT; HORNED	LENTIBULARIACEAE	APN/F	OBL
UTRICULARIA GIBBA	UTGI	BLADDERWORT; HUMPED	LENTIBULARIACEAE	APNZ//	OBL
UTRICULARIA INTERMEDIA	UTIN2	BLADDERWORT; FLAT-LEAF	LENTIBULARIACEAE	ANZF	OBL
UTRICULARIA MACRORHIZA	UTMA	BLADDERWORT; COMMON	LENTIBULARIACEAE	PN/F	OBL
UTRICULARIA MINOR	UTMI	BLADDERWORT; LESSER	LENTIBULARIACEAE	PNZF	OBL
UTRICULARIA PURPUREA	UTPU	BLADDERWORT; PURPLE	LENTIBULARIACEAE	APNZ//	OBL
UVULARIA SESSILIFOLIA	UVSE	BELLWORT; SESSILE-LEAF	LILIACEAE	PNF	FAC-
VACCINIUM ANGUSTIFOLIUM	VAAN	BLUEBERRY; LOWBUSH	ERICACEAE	NS	FACU
VACCINIUM CESPITOSUM	VACE	BLUEBERRY; DWARF	ERICACEAE	NS	FACU*
VACCINIUM MACROCARPON	VAMA	CRANBERRY; LARGE	ERICACEAE	NS	OBL
VACCINIUM MYRTILLOIDES	VAMY	BLUEBERRY; VELVET-LEAF	ERICACEAE	NS	FACW-
VACCINIUM OXYCOCCOS	VAOX	CRANBERRY; SMALL	ERICACEAE	NS	OBL
VACCINIUM ULIGINOSUM	VAUL	BLUEBERRY; BOG	ERICACEAE	IS	FAC*
VACCINIUM VITIS-IDAEA	VAVI	CRANBERRY; MOUNTAIN	ERICACEAE	NS	FAC
VALERIANA EDULIS	VAED	VALERIAN; EDIBLE	VALERIANACEAE	PNF	FACW+
VALLISNERIA AMERICANA	VAAM3	WILD-CELERY	HYDROCHARITACEAE	PIZF	OBL
VERATRUM VIRIDE	VEVI	FALSE-HELLEBORE; AMERICAN	LILIACEAE	PNF	FACW+
VERBENA BRACTEATA	VEBR	VERVAIN; PROSTRATE	VERBENACEAE	APNF	FACU

{Indicator status: UPL ↔ FACU ↔ FACU ↔ FACU' ↔ FAC' ↔ FAC ↔ FAC' ↔ FACW ↔ FACW ↔ FACW' ↔ OBL}

Species					
Indicator					
Scientific Name	Abrev.	Common Name	Family	Habit	Status
VERBENA HASTATA	VEHA2	VERVAIN; BLUE	VERBENACEAE	PNF	FACW+
VERBENA URTICIFOLIA	VEUR	VERVAIN; WHITE	VERBENACEAE	APNF	FAC+
VERBENA X RYDBERGII	VERY	VERVAIN	VERBENACEAE	NF	FACW*
VERNONIA BALDWINII	VEBA	IRONWEED; BALDWIN'S	ASTERACEAE	PNF	UPL
VERNONIA FASCICULATA	VEFA2	IRONWEED; PRAIRIE	ASTERACEAE	PNF	FACW
VERONICA AMERICANA	VEAM2	SPEEDWELL; AMERICAN	SCROPHULARIACEAE	PNESF	OBL
VERONICA ARVENSIS	VEAR	SPEEDWELL; CORN	SCROPHULARIACEAE	AIF	NI
VERONICA CATENATA	VECA7	SPEEDWELL; PINK WATER	SCROPHULARIACEAE	PNEF	OBL
VERONICA OFFICINALIS	VEOF2	SPEEDWELL; COMMON	SCROPHULARIACEAE	PIF	UPL
VERONICA PEREGRINA	VEPE2	SPEEDWELL; PURSLANE	SCROPHULARIACEAE	ANEF	FACW+
VERONICA SCUTELLATA	VESC2	SPEEDWELL; MARSH	SCROPHULARIACEAE	PIF	OBL
VERONICA SERPYLLIFOLIA	VESE	SPEEDWELL; THYME-LEAF	SCROPHULARIACEAE	PIF	FACW
VERONICASTRUM VIRGINICUM	VEVI4	CULVER'S-ROOT	SCROPHULARIACEAE	PNF	FAC
VIBURNUM ACERIFOLIUM	VIAC	VIBURNUM; MAPLE-LEAF	CAPRIFOLIACEAE	NS	UPL*
VIBURNUM DENTATUM	VIDE	ARROW-WOOD	CAPRIFOLIACEAE	NTS	FAC
VIBURNUM EDULE	VIDE	SQUASHBERRY	CAPRIFOLIACEAE	NS	FACW
VIBURNUM LENTAGO	VILE	NANNYBERRY	CAPRIFOLIACEAE	NTS	FAC+
VIBURNUM TRILOBUM	VITR8	CRANBERRYBUSH; AMERICAN	CAPRIFOLIACEAE	N	FACW
VICIA AMERICANA	VIAM	VETCH; AMERICAN PURPLE	FABACEAE	PNFV	NI
VICIA SATIVA	VISA	VETCH; COMMON	FABACEAE	AIFV	FACU-
VIOLA ADUNCA	VIAD	VIOLET; HOOKED-SPUR	VIOLACEAE	PNF	FAC-
VIOLA AFFINIS	VIAF2	VIOLET; LECONTE'S	VIOLACEAE	PNF	FACW
VIOLA BLANDA	VIBL	VIOLET; SWEET WHITE	VIOLACEAE	PNF	FACW-
VIOLA CONSPERSA	VICO2	VIOLET; AMERICAN DOG	VIOLACEAE	PNF	FACW-
VIOLA CUCULLATA	VICU	VIOLET; MARSH BLUE	VIOLACEAE	PNF	OBL
VIOLA INCOGNITA	VIIN	VIOLET; LARGE-LEAF WHITE	VIOLACEAE	PNF	FACW
VIOLA LABRADORICA	VILA10	VIOLET; ALPINE	VIOLACEAE	PNF	FAC*
VIOLA LANCEOLATA	VILA4	VIOLET; LANCE-LEAF	VIOLACEAE	PNF	OBL
VIOLA MISSOURIENSIS	VIM3	VIOLET; MISSOURI	VIOLACEAE	PNF	FACW
VIOLA NEPHROPHYLLA	VINE	VIOLET; NORTHERN BOG	VIOLACEAE	PNF	FACW+
VIOLA NOVAE-ANGLIAE	VINO	VIOLET; NEW ENGLAND BLUE	VIOLACEAE	PNF	OBL
VIOLA PALLENS	VIPA8	VIOLET; NORTHERN WHITE	VIOLACEAE	NF	OBL
VIOLA PALUSTRIS	VIPA4	VIOLET; MARSH	VIOLACEAE	PNF	NI
VIOLA PAPILIONACEA	VIPA5	VIOLET; COMMON BLUE	VIOLACEAE	PNF	FAC
VIOLA PEDATA	VIPE	VIOLET; BIRD'S-FOOT	VIOLACEAE	PNF	UPL
VIOLA PEDATIFIDA	VIPE2	VIOLET; PRAIRIE	VIOLACEAE	PNF	FACU-
VIOLA PENNSYLVANICA	VIPE4	VIOLET; SMOOTH YELLOW	VIOLACEAE	PNF	FACW-
VIOLA PRATINCOLA	VIPR5	VIOLET; BLUE PRAIRIE	VIOLACEAE	PNF	FAC
VIOLA PRIMULIFOLIA	VIPR4	VIOLET; PRIMROSE-LEAF	VIOLACEAE	PNF	FACW+
VIOLA PUBESCENS	VIPU3	VIOLET; DOWNY YELLOW	VIOLACEAE	PNF	FACU-
VIOLA RENIFOLIA	VIRE2	VIOLET; KIDNEY-LEAF WHITE	VIOLACEAE	PNF	FACW
VIOLA SAGITTATA	VISA2	VIOLET; ARROW-LEAF	VIOLACEAE	PNF	FACW-
VIOLA SORORIA	VISO	VIOLET; WOOLLY BLUE	VIOLACEAE	PNF	FAC-
VIOLA STRIATA	VIST3	VIOLET; STRIPED CREAM	VIOLACEAE	PNF	FACW
VITIS AESTIVALIS	VIAE	GRAPE; SUMMER	VITACEAE	NWV	FACU
VITIS LABRUSCA	VILA9	GRAPE; FOX	VITACEAE	IWV	FACU
VITIS RIPARIA	VIRI	GRAPE; RIVER-BANK	VITACEAE	NWV	FACW-
VITIS VULPINA	VIVU	GRAPE; FROST	VITACEAE	NWV	FACW-
VULPIA OCTOFLORA	VUOC	FESCUE; SIX-WEEKS	POACEAE	ANG	FACU-*
WOLFFIA COLUMBIANA	WOCO	WATER-MEAL; COLUMBIA	LEMNACEAE	PN/F	OBL
WOLFFIA PAPULIFERA	WOPA	WATER-MEAL	LEMNACEAE	PN/F	OBL
WOLFFIA PUNCTATA	WOPU	WATER-MEAL; DOTTED	LEMNACEAE	PN/F	OBL
XANTHIUM STRUMARIUM	XAST	COCKLE-BUR; ROUGH	ASTERACEAE	ANF	FAC
XYRIS MONTANA	XYMO	YELLOW-EYED-GRASS; NORTHERN	XYRIDACEAE	PNEF	OBL
XYRIS TORTA	XYTO	YELLOW-EYED-GRASS; TWISTED	XYRIDACEAE	PNEF	OBL
ZANNICHELLIA PALUSTRIS	ZAPA	PONDWEED; HORNED	ZANNICHELLIACEAE	PNZF	OBL
ZIGADENUS ELEGANS	ZIEL2	DEATHCAMAS; MOUNTAIN	LILIACEAE	PNF	FAC-

ZIGADENUS GLAUCUS	ZIGL2	CAMAS; WHITE	LILIACEAE	PNF	FACW
ZIZANIA AQUATICA	ZIAQ	WILDRICE; ANNUAL	POACEAE	ANEG	OBL
ZIZIA APTERA	ZIAP	ALEXANDERS; HEART-LEAF	APIACEAE	PNF	FACU
ZIZIA AUREA	ZIAU	ALEXANDERS; GOLDEN	APIACEAE	PNF	FAC+
ZOSTERELLA DUBIA	ZODU	STAR-GRASS; WATER	PONTEDERIAACEAE	APN/F	OBL

### DEFINITIONS AND EXPLANATIONS

#### Wetland (from Minn. Rules 8420)

"Wetlands" means lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands must:

- 1) have a predominance of hydric soils;
- 2) be inundated or saturated by surface water or ground water at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions; and,
- 3) under normal circumstances, support a prevalence of hydrophytic vegetation.

#### *Indicator Status*

OBL	Always found in wetlands; wetland occurrence >99%
FACW	Usually found in wetlands but occasionally in non-wetlands; wetland occurrence 67-99%
FAC	Sometimes found in wetlands but also occur in non-wetlands; wetland occurrence 34-66%
FACU	Seldom found in wetlands and usually occur in non-wetlands; wetland occurrence 1-33%
UPL	May occur in wetlands; wetland occurrence <1%; unlisted species do not occur in wetlands
+	A modifier to indicate a <u>more</u> frequent occurrence in wetlands
-	A modifier to indicate a <u>less</u> frequent occurrence in wetlands
*	The indicator was derived from limited ecological information
NA	No unanimous agreement by the Review Panel as to the indicator status
NI	Species with little or no information to establish an indicator status

#### *Habit*

This is a general classification of the plant characteristics. Symbols are combined to describe the life form of the species.

<b>A</b>	Annual	<b>F3</b>	Fern	<b>N</b>	Native	<b>Z</b>	Submerged
<b>B</b>	Biennial	<b>G</b>	Grass	<b>P</b>	Perennial	<b>\$</b>	Succulent
<b>C</b>	Clubmoss	<b>GL</b>	Grasslike	<b>+</b>	Parasitic	<b>T</b>	Tree
<b>E</b>	Emergent	<b>H</b>	Partly woody	<b>P3</b>	Pepperwort	<b>V</b>	Herbaceous vine
<b>@</b>	Epiphytic	<b>HS</b>	Halfshrub	<b>Q</b>	Quillwort	<b>W</b>	Waterfern
<b>F</b>	Forb	<b>H2</b>	Horsetail	<b>S</b>	Shrub	<b>WV</b>	Woody vine
<b>/</b>	Floating	<b>I</b>	Introduced	<b>-</b>	Saprophytic		

## LAKE SUPERIOR COASTAL WETLANDS FINAL PLANT LIST 2003

September 15, 2003

Gary B. Walton

This list represents plants from the “Minnesota List of Plants That Occur in Wetlands” discussed on the web pages and/or on field trips. Most of the common names are from the list except for a few which I felt were too long or just incorrect. As an example: *Ledum groenlandicum* which we usually call “Labrador Tea” or “Swamp Tea” or “Bog Tea” is on the Minnesota List “Greenland Labrador Tea” which is just getting ridiculous. Again, another reason use of the binomial nomenclature system is preferable to so-called common names.

SCIENTIFIC NAME	COMMON NAME	WETLAND STATUS
<i>Abies balsamea</i>	Balsam Fir	FACW
<i>Acer negundo</i>	Box-Elder	FACW-
<i>Acer rubrum</i>	Red Maple	FAC
<i>Acer saccharinum</i>	Silver Maple	FACW
<i>Acer saccharum</i>	Sugar Maple	FACU
<i>Acer spicatum</i>	Mountain Maple	FACU*
<i>Achillea millefolium</i>	Common Yarrow	FACU
<i>Acorus calamus</i>	Sweetflag	OBL
<i>Agropyron repens</i>	Quackgrass	FACU
<i>Agropyron trachycaulum</i>	Slender Wheatgrass	FAC
<i>Agrostis gigantea</i>	Redtop	FACW
<i>Agrostis hyemalis</i>	Winter Bentgrass, Tickle Grass	FAC-
<i>Alisma plantago-aquatica</i>	Broad-Leaf Water Plantain	OBL
<i>Allium tricoccum</i>	Wild Leek	FACU
<i>Alnus crispa</i>	Green Alder	FAC
<i>Alnus rugosa</i>	Speckled or Tag Alder	OBL
<i>Alopecurus aequalis</i>	Short-Awn Foxtail	OBL
<i>Alopecurus pratensis</i>	Meadow Foxtail	FACW
<i>Amelanchier spicata</i>	Low Juneberry	FACU
<i>Andropogon gerardii</i>	Big Bluestem	FAC
<i>Anemone canadensis</i>	Canada Thimbleweed	FACW
<i>Anemone quinquefolia</i>	American Woodland Anemone	FAC*
<i>Anemone virginiana</i>	Tall Thimbleweed	NI

SCIENTIFIC NAME	COMMON NAME	WETLAND STATUS
<i>Apocynum cannabinum</i>	Clasping-Leaf Dogbane	FAC
<i>Apocynum androsaemifolium</i>	Dogbane	no rating
<i>Aquilegia canadensis</i>	Wild Columbine	FAC-
<i>Aralia nudicaulis</i>	Wild Sarsapaarilla	FACU
<i>Arisaema triphyllum</i>	Swamp Jack-In-The-Pulpit	FACW-
<i>Asarum canadense</i>	Wild Ginger	no rating
<i>Asclepias incarnata</i>	Swamp Milkweed	OBL
<i>Asclepias syriaca</i>	Common Milkweed	no rating
<i>Aster macrophyllus</i>	Big-Leaf Aster	no rating
<i>Aster puniceus</i>	Swamp Aster	OBL
<i>Aster simplex</i> (correctly: <i>A. lanceolatus</i> )	Panicled Aster	FACW
<i>Aster umbellatus</i>	Flat-Top White Aster	FACW
<i>Athyrium filix-femina</i>	Subarctic Lady Fern	FAC
<i>Beckmannia syzigachne</i>	American Sloughgrass	OBL
<i>Betula alleghaniensis</i>	Yellow Birch	FAC
<i>Betula papyrifera</i>	Paper Birch	FACU+
<i>Betula pumila</i>	Bog Birch	OBL
<i>Bidens cernua</i>	Nodding Beggar-Ticks	OBL
<i>Bidens frondosus</i> (NOT "frondosa" which is incorrect grammatically)	Devil's Beggar-Ticks	FACW
<i>Botrychium dissectum</i>	Cutleaf Grapefern	FAC
<i>Botrychium matricarifolium</i>	Daisy-Leaf Moonwort	FACU
<i>Botrychium multifidum</i>	Leathery Grapefern	FACU
<i>Botrychium simplex</i>	Least Grapefern or Moonwort	FAC
<i>Bromus ciliatus</i>	Fringed Brome	FACW
<i>Bromus inermis</i>	Smooth Brome	no rating
<i>Bromus kalmii</i>	Kalm's Brome	FAC
<i>Calamagrostis canadensis</i>	Bluejoint Reedgrass	OBL
<i>Calla palustris</i>	Wild Calla	OBL

SCIENTIFIC NAME	COMMON NAME	WETLAND STATUS
<i>Callitriche verna</i>	Spiny Water-Starwort	OBL
<i>Caltha natans</i>	Floating Marsh Marigold	OBL
<i>Caltha palustris</i>	Common Marsh Marigold	OBL
<i>Carex backii</i>	Backi's Sedge	no rating
<i>Carex brunnescens</i>	Brownish Sedge	FACW
<i>Carex crinita</i>	Fringed Sedge	FACW+
<i>Carex deweyana</i>	Short-Scale Sedge	FACU-
<i>Carex diandra</i>	Lesser Panicked Sedge	OBL
<i>Carex disperma</i>	Soft-Leaf Sedge	OBL
<i>Carex gracillima</i>	Graceful Sedge	FACU*
<i>Carex interior</i>	Inland Sedge	OBL
<i>Carex intumescens</i>	Bladder Sedge	FACW+
<i>Carex lacustris</i>	Lakebank Sedge	OBL
<i>Carex lupulina</i>	Hop Sedge	OBL
<i>Carex peckii</i>	Peck's Sedge	no rating
<i>Carex pedunculata</i>	Stalked Sedge	no rating
<i>Carex retrorsa</i>	Retrorse Sedge	OBL
<i>Carex rostrata</i>	Beaked Sedge	OBL
<i>Carex trisperma</i>	Three-Seeded Sedge	OBL
<i>Carex umbellata</i>	Tufted Sedge	no rating
<i>Chamaedaphne calyculata</i>	Leatherleaf	OBL
<i>Chelone glabra</i>	White Turtlehead	OBL
<i>Cicuta bulbifera</i>	Bulblet-Bearing Water Hemlock	OBL
<i>Cicuta maculata</i>	Spotted Water Hemlock	OBL
<i>Cirsium arvense</i>	Field or Creeping Thistle	FACU
<i>Cirsium discolor</i>	Pasture Thistle	no rating
<i>Cirsium flodmanii</i>	Flodman's Thistle	NI
<i>Cirsium muticum</i>	Swamp Thistle	OBL
<i>Cirsium undulatum</i>	Wavy-Leaf Thistle	FAC-
<i>Cirsium vulgare</i>	Bull Thistle	FACU-
<i>Claytonia caroliniana</i>	Broadleaf Spring Beauty	FACU
<i>Clintonia borealis</i>	Blue Bead Lily	FAC+
<i>Conyza canadensis</i>	Canada Horseweed	FAC-
<i>Coptis trifolia</i>	Alaska Goldthread	FACW
<i>Corallorrhiza trifida</i>	Early Coralroot	FACW-

SCIENTIFIC NAME	COMMON NAME	WETLAND STATUS
<i>Cornus alternifolia</i>	Pagoda Dogwood	no rating
<i>Cornus canadensis</i>	Canada Bunchberry	FAC
<i>Cornus rugosa</i>	Roundleaf Dogwood	no rating
<i>Cornus stolonifera</i>	Red-Osier Dogwood	FACW
<i>Corylus americana</i>	American Hazelnut	FACU-
<i>Corylus cornuta</i>	Beaked Hazelnut	UPL
<i>Crataegus chrysocarpus</i>	Fireberry Hawthorn	no rating
<i>Crataegus crus-galli</i>	Cockspur Hawthorn	FAC
<i>Crataegus mollis</i>	Downy Hawthorn	FACW-
<i>Danthonia spicata</i>	Povery Oats	no rating
<i>Deschampsia flexuosa</i>	Wavy Hairgrass	no rating
<i>Dryopteris cristata</i>	Crested Shield-Fern	OBL
<i>Dryopteris carthusiana</i> ( <i>spinulosa</i> )	Spinulose Shield-Fern	FACW
<i>Echinochloa crusgalli</i>	Barnyard Grass	FACW
<i>Eleocharis ovata</i>	Ovate Spikerush	OBL
<i>Elymus canadensis</i>	Nodding or Canada Wild Rye	FAC-
<i>Epilobium angustifolium</i>	Fireweed	FAC
<i>Equisetum arvense</i>	Field Horsetail	FAC
<i>Equisetum fluviatile</i>	Water Horsetail	OBL
<i>Equisetum hyemale</i>	Rough Horsetail or Scouringrush	FACW-
<i>Equisetum laevigatum</i>	Smooth Scouringrush	FACW
<i>Equisetum palustre</i>	Marsh Horsetail	FACW
<i>Equisetum pratense</i>	Meadow Horsetail	FAC+
<i>Equisetum sylvaticum</i>	Woodland Horestail	FACW
<i>Equisetum variegatum</i>	Variegated Horsetail	FACW
<i>Erigeron annuus</i>	White-Top Fleabane	FAC-
<i>Eupatorium maculatum</i>	Spotted Joe-Pye-Weed	OBL
<i>Eupatorium perfoliatum</i>	Common Boneset	FACW+
<i>Euphorbia esula</i>	Leafy Spurge	no rating
<i>Euthamia graminifolia</i>	Grass-Leaved Goldenrod	FACW-

SCIENTIFIC NAME	COMMON NAME	WETLAND STATUS
<i>Fragaria virginiana</i>	Wild Strawberry	FAC-
<i>Fraxinus nigra</i>	Black Ash	FACW+
<i>Fraxinus pennsylvanica</i>	Green Ash	FACW
<i>Galium boreale</i>	Northern Bedstraw	FAC
<i>Gentiana andrewsii</i>	Fringe-Top Bottle Gentian	FACW
<i>Geum macrophyllum</i>	Large-Leaf Avens	FACW+
<i>Glyceria canadensis</i>	Canada Manna Grass	OBL
<i>Glyceria maxima (G. grandis)</i>	Reed Meadowgrass	OBL
<i>Glyceria striata</i>	Fowl Manna Grass	OBL
<i>Gymnocarpium dryopteris</i>	Oak Fern	FAC
<i>Helianthus giganteus</i>	Tall sunflower	FACW
<i>Heliopsis helianthoides</i>	False Sunflower, Wild Zinnia	no rating
<i>Heracleum lanatum</i>	Cow Parsnip	FACW+
<i>Ilex verticillata</i>	Common Winterberry	FACW+
<i>Impatiens capensis</i>	Spotted Jewelweed	FACW
<i>Iris versicolor</i>	Blueflag, Wild Iris	OBL
<i>Juncus effusus</i>	Soft Rush	OBL
<i>Juncus tenuis</i>	Slender or Path Rush	FAC
<i>Juniperus communis</i>	Spreading Juniper	no rating
<i>Larix laricina</i>	Tamarack	FACW
<i>Ledum groenlandica</i>	Labrador Tea	OBL
<i>Lemna minor</i>	Lesser Duckweed	OBL
<i>Linnaea borealis</i>	Twinflower	FAC
<i>Liparis loeselii</i>	Fen Orchis	FACW+
<i>Lonicera canadensis</i>	American Fly-Honeysuckle	FACU

SCIENTIFIC NAME	COMMON NAME	WETLAND STATUS
<i>Luzula acuminata</i>	Hairy Woodrush	FAC-
<i>Lycopodium (Diphasiastrum) digitatum</i>	Fan-Leaf Groundcedar	no rating
<i>Lysimachia ciliata</i>	Fringed Loosestrife	FACW
<i>Lythrum salicaria</i>	Purple Loosestrife	OBL
<i>Maianthemum canadense</i>	Canada Mayflower	FAC
<i>Matteuccia struthiopteris</i>	Ostrich Fern	FACW
<i>Melilotus officinalis</i>	Yellow Sweetclover	FACU
<i>Mentha arvensis</i>	Field Mint	FACW
<i>Mertensia paniculata</i>	Tall Bluebells	FAC
<i>Monarda fistulosa</i>	Wild Bergamot	FACU
<i>Myrica gale</i>	Sweetgale	OBL
<i>Oenothera biennis</i>	Common Evening Primrose	FACU
<i>Onoclea sensibilis</i>	Sensitive Fern	OBL
<i>Osmunda cinnamomea</i>	Cinnamon Fern	FACW
<i>Osmunda claytoniana</i>	Interrupted Fern	FAC+
<i>Parthenocissus virginiana</i>	Virginia Creeper	FAC-
<i>Petasites palmatus</i>	Sweet Coltsfoot	FACW
<i>Phalaris arundinacea</i>	Reed Canary Grass	FACW+
<i>Phegopteris thelypteris</i>	Northern Beech Fern	no rating
<i>Phleum pratense</i>	Timothy	FACU
<i>Picea glauca</i>	White Spruce	FACU
<i>Picea mariana</i>	Black Spruce	FACW
<i>Pinus banksiana</i>	Jack Pine	FACU

SCIENTIFIC NAME	COMMON NAME	WETLAND STATUS
<i>Pinus resinosa</i>	Red Pine	FACU
<i>Pinus strobus</i>	White Pine	FACU
<i>Platanthera hyperborea</i>	Northern Green or Bog Orchid	FACW+
<i>Poa palustris</i>	Fowl Bluegrass	FACW+
<i>Poa pratensis</i>	Kentucky Bluegrass	FAC-
<i>Polygonum hydropiper</i>	Marshpepper Smartweed	OBL
<i>Polygonum sagittatum</i>	Arrowleaf Tearthumb	OBL
<i>Populus balsamifera</i>	Balsam Poplar	FACW
<i>Populus deltoides</i>	Eastern Cottonwood	FAC+
<i>Populus grandidentata</i>	Big-Tooth Aspen	FACU
<i>Populus tremuloides</i>	Quaking Aspen	FAC
<i>Potentilla fruticosa</i>	Shrubby Cinquefoil	FACW
<i>Potentilla norvegica</i>	Norwegian Cinquefoil	FAC
<i>Potentilla simplex</i>	Old Field Cinquefoil	FACU-
<i>Prenanthes alba</i>	White Rattlesnake Root	FACU
<i>Prunus americana</i>	American Plum	UPL
<i>Prunus nigra</i>	Canada Plum	FACU-
<i>Prunus pensylvanica</i>	Pin or Fire Cherry	FACU
<i>Prunus virginiana</i>	Chokecherry	FAC-
<i>Pteridium aquilinum</i>	Bracken Fern	FACU
<i>Puccinellia (Torreyochloa) pallida</i>	Pale Manna Grass	OBL
<i>Quercus macrocarpa</i>	Bur Oak	FAC-
<i>Quercus rubra</i>	Red Oak	FACU
<i>Ranunculus acris</i>	Tall Buttercup	FACW-
<i>Ranunculus gmelinii</i>	Small Yellw Water Crowfoot	OBL
<i>Ranunculus pensylvanicus</i>	Pennsylvania Buttercup	OBL
<i>Rhamnus cathartica</i>	Common Buckthorn	FACU
<i>Ribes hirtellum</i>	Hairystem Goosberry	FACW
<i>Ribes triste</i>	Swamp Red Currant	OBL
<i>Rosa acicularis</i>	Prickly Rose	FACU
<i>Rosa blanda</i>	Smooth Rose	FACU

SCIENTIFIC NAME	COMMON NAME	WETLAND STATUS
<i>Rubus parviflorus</i>	Western Thimbleberry	FACU+
<i>Rubus pubescens</i>	Dwarf Blackberry	FACW+
<i>Rubus setosus</i>	Setose Raspberry	FACW-
<i>Rubus strigosus</i>	Red Raspberry	FACW-
<i>Salix bebbiana</i>	Bebb's Willow	FACW+
<i>Salix discolor</i>	Pussy Willow	FACW
<i>Salix exigua</i>	Sandbar Willow	OBL
<i>Salix fragilis</i>	Crack Willow	FAC+
<i>Salix humilis</i>	Tall Prairie Willow	FACU
<i>Salix lucida</i>	Shining Willow	FACW+
<i>Salix petiolaris (S. gracilis)</i>	Meadow Willow	FACW+
<i>Salix planifolia</i>	Diamond-Leaf Willow	OBL
<i>Salix pyrifolia</i>	Balsam Willow	FACW
<i>Salix serissima</i>	Autumn Willow	OBL
<i>Sambucus racemosa</i>	Red Elderberry	FACU+
<i>Sanguinaria canadensis</i>	Bloodroot	FACU-
<i>Sanicula canadensis</i>	Canadian Black Snakeroot	FACU-*
<i>Schizachne purpurascens</i>	False Melic Grass	FACU+
<i>Scirpus cyperinus</i>	Woolgrass	OBL
<i>Scirpus microcarpus (S. rubrotinctus)</i>	Small-Fruit Bulrush	OBL
<i>Setaria glauca</i>	Yellow Bristle Grass	FAC
<i>Setaria italica</i>	Fox-Tail Bristle Grass	FACU
<i>Setaria verticillata</i>	Bur Bristle Grass	FAC
<i>Sium suave</i>	Water Parsnip	OBL
<i>Solidago canadensis</i>	Canada Goldenrod	FACU
<i>Solidago flexicaulis</i>	Zigzag Goldenrod	FACU
<i>Solidago gigantea</i>	Giant Goldenrod	FACW
<i>Solidago juncea</i>	Early Goldenrod	no rating
<i>Solidago nemoralis</i>	Gray Goldenrod	no rating
<i>Solidago uliginosa</i>	Bog Goldenrod	OBL
<i>Sorbus americana</i>	American Mountain Ash	FAC+
<i>Sorbus decora</i>	Showy Mountain Ash	UPL
<i>Sparganium chlorocarpum</i>	Greenfruit Bur-Reed	OBL
<i>Sparganium glomeratum</i>	Clustered Bur-Reed	OBL

SCIENTIFIC NAME	COMMON NAME	WETLAND STATUS
<i>Thalictrum dasycarpum</i>	Purple or Tall Meadowrue	FACW-
<i>Thuja occidentalis</i>	White Cedar	FACW
<i>Tilia americana</i>	American Basswood	FACU
<i>Trientalis borealis</i>	American Starflower	FAC+
<i>Trifolium hybridum</i>	Alsike Clover	FAC-
<i>Trifolium pratense</i>	Red Clover	FACU+
<i>Trifolium repens</i>	White Clover	FACU+
<i>Trillium cernuum</i>	Nodding Trillium	FAC
<i>Typha latifolia</i>	Broadleaf Cattail	OBL
<i>Ulmus americana</i>	American Elm	FACW-
<i>Uvularia grandiflora</i>	Yellow Merrybells	no rating
<i>Uvularia sessilifolia</i>	Sessile-Leaf Bellwort	FAC-
<i>Vaccinium angustifolium</i>	Lowbush Blueberry	FACU
<i>Vaccinium myrtilloides</i>	Velvetleaf Blueberry	FACW-
<i>Valeriana officinalis</i>	Valerian	no rating
<i>Veronica officinalis</i>	Common Speedwell	UPL
<i>Viburnum lentago</i>	Nannyberry	FAC+
<i>Viburnum rafinesquianun</i>	Downy Arrow-wood	no rating
<i>Viburnum trilobum (T. opulus)</i>	Highbush Cranberry	FACW
<i>Vicia americana</i>	American Vetch	NI
<i>Viola adunca</i>	Hooked Spur Violet	FAC-
<i>Viola blanda</i>	Sweet White Violet	FACW-
<i>Viola conspersa</i>	American Dog Violet	FACW-
<i>Viola cucullata</i>	Marsh Blue Violet	OBL
<i>Viola novae-angliae</i>	New England Violet	OBL
<i>Viola pallens</i>	Northern White Violet	OBL
<i>Viola pensylvanica</i> (including <i>V. pubescens</i> )	Smooth Yellow Violet	FACW-
<i>Viola renifolia</i>	Kidney Leaf Violet	FACW
<i>Viola sororia</i>	Wooly Blue Violet	FACW

# Lake Superior Coastal Wetlands Web Pages 2003



## BASSWOOD (*Tilia americana*)

March 18, 2003

Gary B. Walton

**American Basswood (*Tilia americana*, FACU)** is a large tree to 40 meters and often with several trunks (the result of stump resprouting) found in rich moist soils. Large mature trees will have buttressed stems as far up as 2 meters. Frequently it occurs in association with Sugar Maple (*Acer saccharum*, FACU) and other hardwoods including Red Oak (*Quercus rubra*, FACU) and Ironwood (*Ostrya virginiana*, FACU-).

The twigs of *T. americana* are thick (2-4 mm) with large alternate buds. These buds may be either red or green. The large leaves (7-15 cm) are cordate at the base with sharply serrate margins. The fruit is a hard globose, indehiscent and nut-like with two seeds. This species is not likely to be confused with any other of our native trees.



**Clockwise from top left: Leaf buds, fruit, and bark of American Basswood.**



## OAKS (*Quercus*)

March 18, 2003

Gary B. Walton

**Red Oak (*Quercus rubra*)** and **Bur Oak (*Q. macrocarpus*)** are the two species of oak native to northeastern Minnesota although **Pin Oak (*Q. ellipsoidalis*)** may occur infrequently on rocky sites in far northwestern St. Louis County. *Q. macrocarpus* and *Q. rubra* are distinct enough to not be confused with each other although *Q. ellipsoidalis* could be confused with *Q. rubra*. Key differences are:

- 1) Buds: *Q. macrocarpus* winter buds are pubescent. *Q. rubra* and *Q. ellipsoidalis* have glabrous winter buds.
- 2) Leaves: *Q. rubra* 10-20 cm long leaves have 7-11 more or less triangular lobes ending in bristled tips. Those of *Q. macrocarpus* have 4-7 blunt to acute lobes, the top of the leaf often broadly rounded. *Q. ellipsoidalis* leaves are similar to those of *Q. rubra* but have 2-3 lobes with deep sinuses extending almost to the mid-vein.
- 3) Fruit (acorns): The cup, which holds the acorn of *Q. macrocarpus*, is fringed with short bristles. On *Q. rubra* and *Q. ellipsoidalis* the cap is not fringed.

Typically, *Q. rubra* occurs on well drained moist soils but is capable of growing on poor soils and damp soils. On good sites *Q. rubra* can attain heights of 50 meters. *Q. ellipsoidalis* prefers poor dry soils and usually grows to 25 meters. *Q. macrocarpus* can grow on moist or dry soils. The eastern variety of *Q. macrocarpus* (var. *macrocarpa*) can grow to 50 meters and occurs on moist soils in floodplains and in woods. The western variety of *Q. macrocarpus* (var. *depressa*) is a shrubby plant more common west of Minnesota and grows on very dry soils. However, scrubby specimens of *Q. macrocarpus* can be found on dry sandy soils in eastern parts of the United States.

Wetland ratings for these oaks are as follows: *Q. rubra* FACU, *Q. macrocarpus* FAC-, and *Q. ellipsoidalis* no wetland rating.



**Left: *Q. macrocarpus* terminal bud. Right: *Q. macrocarpus* bark.**



**Right: *Q. macrocarpa* bark.**

**Two views of the terminal bud of *Q. rubra*.**



***Q. rubra* bark. From a young (about 30 years old) tree. The bark on older trees is much rougher.**

## PUSSY WILLOW (*Salix discolor*) AND PRAIRIE WILLOW (*S. humilis*)

March 18, 2003

Gary B. Walton

These two willow species are very similar in appearance and may be confused. Both have gray tomentose twigs and leaves that are dark green above and lighter below. To add to the possibility of confusion, Prairie Willow (*Salix humilis*), which is FACU, can occur in mesic to wet prairies and other wet sites. Pussy Willow (*S. discolor*, FACW) is largely restricted to swamps but can do well on merely wet soil. Even so, it is not difficult to distinguish the two species.

- 1) Growth form: *S. discolor* is a few stemmed shrub or small tree 2-7 meters. *S. humilis* is a small shrub with many stems and seldom over 3 meters tall.
- 2) Twig tomentum: Young twigs of both species are covered by a soft velvety pubescence. In *S. discolor* this tomentum is soon shed but that of *S. humilis* may last a few years.
- 3) Twig color: Twigs of *S. discolor* are reddish to dark brown and stout. The slender twigs of *S. humilis* are slender, flexible and yellowish to brown.
- 4) Buds: To 1 cm and black in *S. discolor*. Much smaller and lighter colored in *S. humilis*.
- 5) Leaves: Both species have leaves that are dark green above and lighter colored (glaucous) below. Leaf margins differ with those of *S. discolor* regularly round-toothed to toothless. In *S. humilis* the leaf margins are undulate, turned under (revolute) and usually without teeth. Both species are pubescent below but in *S. humilis* the pubescence is more or less persistent.
- 6) Stipules: Rounded and persistent in *S. discolor*, linear and deciduous in *S. humilis*.
- 7) Catkins: Staminate catkins of *S. discolor* are very showy and 2-4 cm long, those of *S. humilis* are also somewhat showy but much smaller at 1-2 cm long.



**Left: *S. discolor* twig with large black buds.  
Right: *S. humilis* twig with tomentum visible.**

## MAPLES (*Acer*)

March 19, 2003

Gary B. Walton

There are six species of Maple (*Acer*) growing in northeastern Minnesota. Five are native and one is a non-native species escaped from cultivation. Maples found in our region can be identified using the characters emphasized in this key adapted from Gleason and Cronquist (1991) or the winter twig key that follows it.

### Flower, leaf, and fruit key

1a. Leaves simple: 2

2a. Sinuses between principle leaf-lobes round, shallow: 3

2b. Sinuses sharp or at least very deep: 4

3a. Juice from broken petioles milky, flowers with petals, samara wings widely divergent at more than 120°: Norway Maple (*Acer platinoides*)

3b. Juice from broken petioles watery, flowers without petals, samara wings diverge at 120° or less: Sugar Maple (*Acer saccharum*)

4a. Flowers appearing as leaves unfold, with petals, on an upright terminal inflorescence, fruit maturing in mid-summer: Mountain Maple (*Acer spicatum*)

4b. Flowers appearing in spring before leaves from clusters on lateral buds, fruit maturing in late spring: 5

5a. Flowers red, with petals: Red Maple (*Acer rubrum*)

5b. Flowers greenish-yellow to red, no petals: Silver Maple (*Acer saccharinum*)

1b. Leaves compound: Box Elder Maple (*Acer negundo*)

### Winter twig key

1a. Pair of leaf scars meet around stem in ascending curved point, bundle scars three or more: Maples (*Acer*) 2

2a. Exposed bud scales two, slender (2 x 5 mm): Mountain Maple (*Acer spicatum*)

2b. Exposed bud scales more than two: 3

3a. Exposed bud scales about four: 4

3b. Exposed bud scales six or more, buds conical, darkening and glabrate; twigs glossy buff: Sugar Maple (*Acer saccharum*)

4a. Leaf scars meeting in a point: 5

4b. Leaf scars not meeting in a point, connected by transverse line: 6

5a. Buds gray-hairy, leaf scars with minute red glands above: Box Elder Maple (*Acer negundo*)

5b. Buds glabrate, leaf scars without minute glands: Norway Maple (*Acer platinoides*)

6a. Bark of trunk rough but not flaking, twigs not ill-smelling: Red Maple (*Acer rubrum*)

6b. Bark of trunk rough and flaking, twigs ill-smelling Silver Maple (*Acer saccharinum*)

1b. Pair of leaf scars meeting around the stem in a straight line, descending curve or not at all, bundle scars three to seven: Elderberry (*Sambucus*), (*Viburnum*), Dogwood (*Cornus*)

### **Species Descriptions**

Typically, maples are found on rich moist soils. **Red Maple (*Acer rubrum*)** has a FAC wetland rating and usually is found on wet sites such as swamps and floodplains but also grows on moist uplands. Height to about 35 meters. In the northern St. Louis County and northern Lake County, *A. rubrum* can be found in swamps and on rock outcrops where there is a small accumulation of soil in the crevices.



***A. rubrum* twigs and buds. Above left: Lateral leaf buds with the transverse line connecting the leaf scars visible (yellow arrow). Above right: Terminal leaf buds showing two of the four exposed leaf scales on the uppermost bud and bud just below it.**

**Sugar Maple (*A. saccharum*)** is a large tree to 40 meters and does best on deep, rich moist soil. Its flowers and developing seeds are frost sensitive, which is why along the Lake Superior Highlands it occurs on the tops of the hills rather than on the lower slopes and valleys. This is because cooler air tends to be heavier and thus rushes down the slopes while lighter warmer air rises to the hilltops. This favors the growth of *A. saccharum* on these hills. The severity of the climate in the northern parts of the Lake Superior Highlands does not favor most of *A. saccharum*'s other forest associates and so it can come to nearly completely dominate some sites. In southern St. Louis County and Carlton County, it occurs on clayey soils with Red Oak, Basswood, Yellow Birch, and Ironwood. *A. saccharum* is rated as FACU.



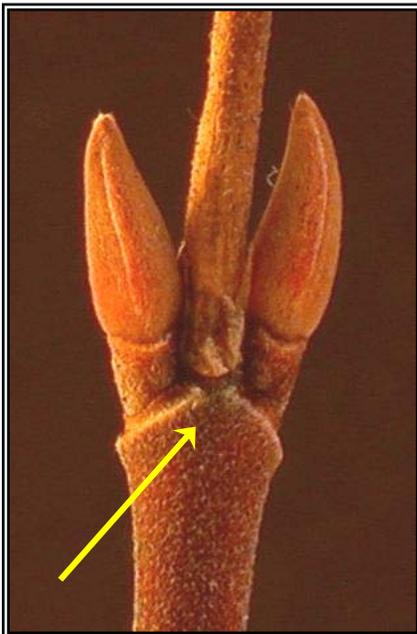
**Right: Sugar Maple twig showing conical terminal bud with six bud scales.**

**Silver Maple (*A. saccharinum*, FACW)** and **Box Elder Maple (*A. negundo*, FACW+)** are native to moist soils along rivers and floodplains. They are however extensively planted in shelterbelts and as yard trees. In urban areas, they often establish themselves in abandoned lots along with other escaped cultivated trees such as Green Ash (*Fraxinus pennsylvanica*, FACW). Natural populations of *A. saccharinum* and *A. negundo* along with Green Ash do occur along parts of the St. Louis River and other large rivers in our area. *A. saccharinum* grows to about 30 meters and often has several stems. *A. negundo* grows to about 20 meters and has stems that begin to lean with age.

**Left: *A. saccharinum* twig. Transverse line connecting opposite leaf scars is visible (yellow arrow). Right: *A. negundo* twig. Pointed leaf scar line visible (yellow arrow).**



**Mountain Maple (*A. spicatum*)** is a shrubby species growing to about 10 meters but usually less. It is rated as FACU\* meaning that its rating is based on less ecological data and with less confidence than for other species. It does seem to grow abundantly near the edges of forested wetlands.



***A. spicatum* twigs showing buds with two leaf scales and in the left photo upward pointing line where leaf scars meet (yellow arrow). Pubescence of twigs visible in both photos.**

**Norway Maple (*A. platinooides*)** is locally established in Duluth along Chester Creek and probably elsewhere too. No wetland rating has been assigned to it although it is a tree of mature upland forests where it grows natively in Europe. Similar in form and size to Sugar Maple (*A. saccharum*).



***A. platinooides* twigs and buds. Pointed leaf scar line visible in right photo (yellow arrow).**

## DOGWOODS (*Cornus*)

March 24, 2003

Gary B. Walton

Our species of Dogwoods (*Cornus*) are mostly shrubs to small often multi-stemmed trees under 4 meters. One, *Cornus canadensis*, is classed an herbaceous plant although its above ground stems are somewhat lignified and can persist for two or more years.

### Key to Identifying the Species

- 1a. Plants woody, shrubs or small trees, leaves deciduous: 2
  - 2a. Leaves alternate, mostly clustered towards tips, twigs purplish, fruit blue, plant a small tree:  
Pagoda Dogwood (*Cornus alternifolia*)
  - 2b. Leaves opposite, plants shrubby, fruit blue or white: 3
    - 3a. Mature twigs brown, young twigs greenish to tan, fruit blue: Gray Dogwood (*Cornus racemosa*)
    - 3b. Twigs red, sometimes greenish: 4
      - 4a. Twigs bright red, plants tending to sprawl or grow as bushes, fruit white:  
Red Osier Dogwood (*Cornus sericea*)
      - 4b. Twigs dull red to pinkish, mottled; plants less prone to sprawl more tree-like, fruit blue: Round-Leaved Dogwood (*Cornus rugosa*)
- 1b. Plants herbaceous, the leaves not deciduous, fruit red: Bunchberry (*Cornus canadensis*)

### Species Descriptions



**Left: *Cornus alternifolia* twig. Alternate arrangement of leaf scars can be seen. Middle and right: twigs of Gray Dogwood.**

**Pagoda Dogwood (*Cornus alternifolia*)** has no wetland rating and is a species found in moist northern hardwoods with Sugar Maple (*Acer sacharrum*). It is tree-like in appearance growing to about 6 meters. The bark is purplish to purple-brown. Unlike all our other native dogwoods, *C. alternifolia* has alternate leaves. Clusters of purple berries are borne on pinkish pedicles.

**Gray Dogwood (*C. racemosa*)** is a shrub to 5 meters found in moist soil along roadsides, in woods, and along stream banks. Twigs if *C. racemosa* are green to tan when young but become gray as they grow older. Its berries are blue. *C. racemosa* is rated as a FACW- species.

**Red Osier Dogwood (*C. sericea*)** is a FACW species found in shrub carrs, swamps, moist woods, ditches, and along stream banks. It is readily distinguished from the similar Round-Leaved Dogwood (*C. rugosa*) by its bright red and when young usually tomentose stems, a more shrubby habit, and white berries. *C. sericea* leaves are mostly lanceolate to ovate and whitened below.



**Left: Bright red twig of *C. sericea*.**

**Middle and right: Twigs of *C. rugosa* showing mottled coloration.**

**Round-Leaved Dogwood (*C. rugosa*)** has no wetland rating. It is found in moist or dry forests, wooded banks, and woodland edges. This species is more tree-like and generally has one to a few upright stems. The young twigs are pinkish to dull red and mottled or sometimes greenish. Mature stems are greenish-yellow. *C. rugosa* leaves are ovate to rotund and somewhat whitened below. The berries are blue.

**Bunchberry** (*C. canadensis*) is a small (to 20 cm) herbaceous colonial plant of cool moist forests. It spreads by rhizomes and can eventually form extensive patches. The leaves in clusters of 4 to 6 are seemingly whorled. Mature stems produce flowers that resemble in miniature those of Flowering Dogwood (*C. florida*). These are later followed by bright red berries. *C. canadensis* wetland rating is FAC.



Large patch of *C. canadensis* growing in a mixed stand of quaking aspen and balsam fir.

**SOME FERNS AND FERN ALLIES THAT ARE EVERGREEN,  
SEMI-EVERGREEN, OR WITH PERSISTENT AERIAL PARTS**

March 24, 2005

Gary B. Walton

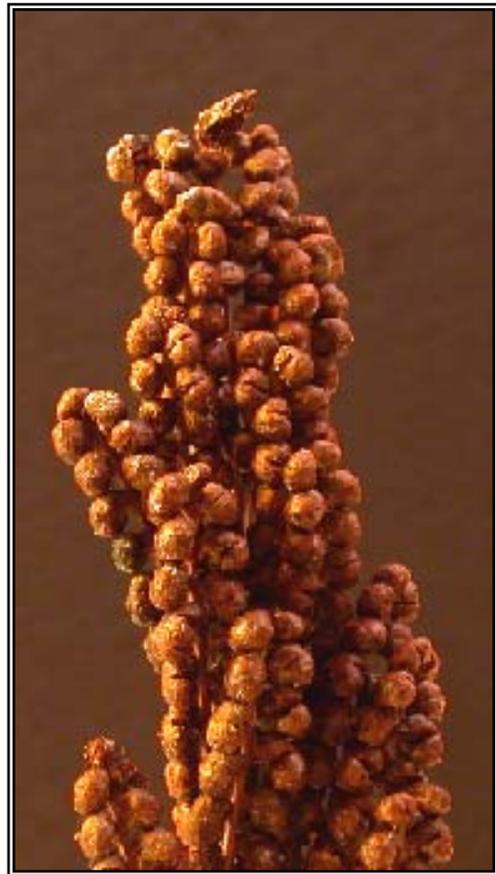
Many ferns die back in the fall but several species have evergreen leaves or other persistent parts thus making it possible to identify them from late fall into the winter and even early spring.



Upper left: Leathery-leaved Grapefern (*Botrychium multifidum*). Habitat includes woodland openings, grassy meadows, disturbed soils succeeding to grasses and shrubs, and edges of vernal pools. Can be very abundant on some sites with populations of 100 or more plants. Individual plants may live as long as 50 years. Wetland rating is FACU.



Lower left: Oblique-Leafed Grape-Fern (*B. dissectum* var. *obliquum*) prefers moister soils than the Leathery-leaved Grape-Fern. Frequent in hardwood forests near vernal pools. Also in meadows near wetland edges. Often associated with other Grape-Fern species (there are 4 species of Grape ferns in Minnesota). Another variety of this species has extremely dissected fronds (var. *dissectum*). Wetland rating is FAC.



**Upper Left:** Upper portion of the spore frond of Ostrich Fern (*Matteucia struthiopteris*) a fern commonly found in very wet soils of swamps, floodplains, and stream banks. Mature leafy fronds can grow up to 3 meters. The plants frequently form extensive colonies by means of long rhizomes. FACW wetland rating.

**Upper Right:** Upper portion of spore frond of Sensitive Fern (*Onoclea sensibilis*). Also common in swamps, along shores, and other wet areas. Leafy fronds grow to about 0.5 meter but are usually around 0.3 or 0.4 meter tall. Also forms colonies by means of rhizomes. Note bead-like sporangia. FACW wetland rating.



**Lower Left:** The fern shown here is a hybrid of the Fancy Woodfern (*Dryopteris intermedia*, FAC) and Toothed Woodfern (*D. spinulosa*, FACW-) known as *D. X triploidea*. Fancy Woodfern has evergreen leaves (as does this plant photographed on March 15, 2003) but leaves of Toothed Woodfern are deciduous. Fancy Woodfern and Toothed Woodfern occur in moist and wet woods and in swamps. Wetland rating for *D. X triploidea* is FAC.



Upper left: Crested Woodfern (*Dryopteris cristata*) is another evergreen Woodfern. Commonly seen in conifer swamps, sedge meadows, and wet woods. The fronds have a very firm texture. Wetland rating is OBL.



Lower left: Fan-Leaf Ground Cedar (*Lycopodium digitatum*, syn. *Diphasiastrum digitatum*) is closely related to Northern Ground Cedar (*L. complanatum*) a FACU species. Fan-Leaf Ground Cedar grows in part shade to full sun in open woods and meadows.



Above: Rough Scouring Rush (*Equisetum hyemale*) is an evergreen species of Horsetail. The stems are usually unbranched (in most species there are branches). Rated as FACW-.

## ASH (*Fraxinus*)

March 25, 2003

Gary B. Walton

Two species of Ash (*Fraxinus*) are native to northeastern Minnesota. **Black Ash (*Fraxinus nigra*)** is a component of many types of swamps including black ash swamps, white cedar swamps, and some mixed conifer swamps. *F. nigra* can grow up to 30 meters in height especially on rich wet soils. Its growth is stunted on peaty soils. *F. nigra* will also grow in mixed deciduous forests with moist soil and areas of poor drainage such as the edges of vernal woodland pools, troughs, and intermittent streambeds. The wetland rating of *F. nigra* is FACW+.

**Green Ash (*F. pennsylvanica*)** is more commonly found in floodplain forests, also in moist forests and as an escape in weedy urban areas. The wetland rating of *F. pennsylvanica* is FACW. While similar in appearance to *F. nigra* it can be readily distinguished by the following characteristics:

- 1) Buds: In *F. nigra* the buds are darkened.
- 2) Leaflets: *F. pennsylvanica* has stalked leaflets.
- 3) Fruit (samaras): The winged fruit of the Ashes are distinct by species. In *F. nigra* the wing extends down the length of the fruit, while *F. pennsylvanica* has a wing that extends only half way down.



**Left: *F. nigra* twig with terminal bud.**

**Right: *F. pennsylvanica* twig with terminal bud.**

## BIRCHES (*Betula*)

March 25, 2003

Gary B. Walton

There are three native species of birch in our area: Yellow Birch (*Betula allegheniensis*), Paper Birch (*B. papyrifera*), and Bog Birch (*B. pumila*). Yellow Birch and *B. papyrifera* are trees between 20 and 30 meters; Bog Birch is a small, multi-stemmed shrub from 2 to 4 meters. A fourth species of birch, the Heartleaf Birch (*B. cordifolia*) usually considered a form of *B. papyrifera* from which it can be barely distinguished occurs along the North Shore.

*B. allegheniensis* is ranked as a FACU species and *B. papyrifera* as FACU+. Generally, *B. allegheniensis* occurs in moist, rich upland soils in association with Sugar Maple and American Basswood. *B. papyrifera* (and the disputed *B. cordifolia*) commonly occurs in association with White Spruce, Balsam Fir, and Quaking Aspen on mesic, somewhat poor soils. *B. papyrifera* can also occur in nearly pure stands especially on sites that have experienced severe disturbance such as fire. Both *B. allegheniensis* and *B. papyrifera* can occur in intermediate to nutrient-rich swamps, either hardwood or conifer types or on moist uplands. *B. pumila*, the Bog Birch, is an inhabitant of minerotrophic fens and swamps and rated OBL wetland.

*B. allegheniensis* and *B. papyrifera* can be readily distinguished using following characteristics:

- 1) Bark: *B. allegheniensis* bark is bronzy to yellowish-gray in mature specimens that peels in long thin shreds. *B. papyrifera* bark is white with dark black diamond-shaped scars where branches grow or grew. Its bark tends to peel in large pieces. The related *B. cordifolia* has bark like *B. papyrifera* but there is a very distinct pinkish cast under the peeling white bark.
- 2) Fruiting catkins (“cones”): On *B. allegheniensis* the catkins are 2-3 cm long, ovoid to short cylindrical, sessile or short-stalked and held more or less upright. Catkins of *B. papyrifera* are 3-5 cm long, more or less long cylindrical, on long stalks and drooping.
- 3) Twigs: The twigs of *B. allegheniensis* have a wintergreen fragrance. Both have softly pubescent twigs especially on younger growth.
- 4) Leaves: Leaves of *B. allegheniensis* are lance-ovate to ovate, ovate-oblong to ovate, 6-10 cm long, coarsely and sharply toothed, and softly pubescent beneath especially in vein axils. *B. papyrifera* leaves are ovate, 5-10 cm long, sharply toothed and sparsely pubescent beneath.



**Right: *B. papyrifera* lateral bud. Some soft hairs visible on twig.**  
**Left: *B. allegheniensis* lateral bud from older portion of twig.**



**Comparison of paper birch (top) and yellow birch bark (bottom).**

Bog Birch (*B. pumila*, northern plants are sometimes known as *Betula pumila* var. *glandulifera*) is a small, multi-stemmed shrub to 2-4 meters tall. Rated as an OBL wetland species, Bog Birch is found in intermediate to rich shrub fens and forested fens, shores and in shrub carrs. Bog Birch is very different looking from Paper and Yellow birches. Besides the shrubby habit, it has firm small leaves somewhat obovate in outline with coarse toothed margins and dotted with small resin glands. Tag Alder (*Alnus rugosa*), which can occur in fens with Bog Birch, has much larger glandular and pliable leaves. The twigs vary from glabrous to lightly pubescent and may have small resinous glands. Unlike other birches, the bark of Bog Birch does not peel. Its cylindrical catkins are about 1-3 cm long and upright. Bog Birch is able to fix atmospheric nitrogen using symbiotic bacteria that live in root nodules a talent also shared by Tag Alder. The related *B. glandulosa* is species of northern Canada and in the most recent taxonomic revisions is not considered present in Minnesota. Previous suggestions (under the name *B. glandulosa* var. *glandulifera*) that it did occur here are based on specimens of *B. pumila* var. *glandulifera*. *B. glandulosa* has large conspicuous warty resin glands on the twigs and resin dots on the leaves. The photographs presented here are of plants that could be called *B. pumila* var. *glandulifera* a designation made on the presence of small resin dots on the leaves and along the young stems. These were found in a shrub fen in Carlton County.



Various views of *B. pumila* from left to right: Old leaf at tip of stem, catkins from previous season, and bark on a three year old stem.



Bog Birch (*B. pumila* var. *glandulifera*) sometimes crosses with Paper Birch (*B. papyrifera*) to make the hybrid species *Betula X sandbergii*. This specimen (shown above) was found on a peaty shore of Bassett Lake in St. Louis Co., MN. Wetland rating of *Betula X sandbergii* is OBL.

**SHRUB TO SMALL TREE WILLOWS (*Salix*) FOUND IN WETLANDS**

March 25, 2003

Gary B. Walton

While most floristic texts present flower and leaf keys for determining species of willows there are apparently none that use characteristics of the winter twigs. These photographs of several of our native shrub willows should be helpful.



**Pussy Willow (*Salix discolor*)  
FACW**



**Slender Willow (*S. gracilis*) FACW+**



**Tea-Leaf Willow (*S. planifolia*) OBL**



**Balsam Willow (*S. pyrifolia*)**  
FACW+



**Shining Willow (*S. lucida*)** FACW+



**Autumn Willow (*S. serissima*)** OBL



**Bebb's Willow (*S. bebbiana*)**  
FACW+



**Sandbar Willow (*S. exigua*)**  
OBL

## SUMAC (*Rhus*)

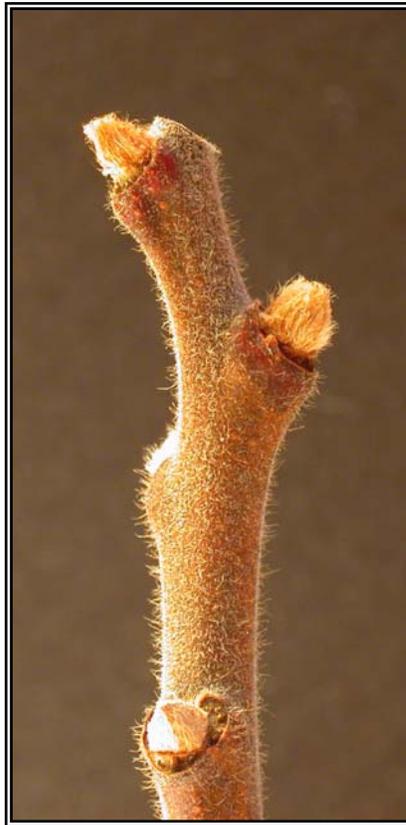
March 25, 2003

Gary B. Walton

There are two species of Sumac (*Rhus*) native to northeastern Minnesota, three is poison ivy is included in the genus. The current taxonomic concept of *Rhus* does not include poison ivy but places it in its own genus *Toxicodendron*. Both our native Sumacs, **Staghorn Sumac (*R. typhina*)** and **Smooth Sumac (*R. glabra*)** are colonial shrubs to small trees with fern-like compound leaves and red fruit covered with red velvety hairs. Apart from less easily observed differences in the fruit hairs, flowering parts and leaflet form, the most readily distinguishing characteristic that separates the two Sumacs are the stem pubescence. *R. typhina* stems are covered in a dense hairy tomentum that resemble the antlers of deer in velvet, hence the name “Staghorn Sumac”. *R. glabra* has no or only a few scattered hairs. The differences are readily seen in the photographs below. One specimen shown may be a hybrid between *R. typhina* and *R. glabra* known as *R. X borealis* but the final identification will have to wait until leaves, flowers, and fruit are available. Both species of Sumac and the hybrid grow on well-drained soils.



*R. X borealis* ?



*R. typhina*



*R. glabra*

**SWEETFERN (*Comptonia peregrina*)**

Not a fern at all but a small woody shrub in the Sweet Gale Family, **Sweetfern (*Comptonia peregrina*)** is so named because of its aromatic fern-like leaves. The young twigs are covered with aromatic hairs. The fruit is an achene enclosed in a green spiny bur. No wetland rating and common on sandy dry soils and rock outcrops. *C. peregrina* often forms extensive colonies by means of rhizomes.



**Left: *C. peregrina* stem with some leaves of the previous season.**

**Right: *C. peregrina* stem without leaves. Note short the numerous hairs on both stems.**

**SMOOTH ROSE (*Rosa blanda*) and BRISTLY ROSE (*R. acicularis*)**

Both of these native shrubby Roses (*Rosa*) are widespread in northeastern Minnesota. While they occur in many habitats they are chiefly plants of well drained soils and are rated as FACU species. Smooth Rose (*Rosa blanda*) and Bristly Rose (*R. acicularis*) are common in old fields, wood edges, roadsides, and in open forests. Bristly Rose does occur in some wetlands usually on logs or other slightly raised areas. As is the case with most roses these species have pink fragrant flowers followed by globose to ovoid fleshy red fruit (hips). Smooth Rose may sometimes have white or speckled flowers. It has very few thorns or spines except on the lowermost parts of the plant. Bristly Rose is covered with thorns and spines throughout.

**Right: *R. acicularis*  
stem tip.**

**Left: *R. blanda* stem  
tip.**



## ASPENS AND POPLARS (*Populus*)

March 27, 2003

Gary B. Walton

There are at least six species of *Populus* in northeastern Minnesota but only three can actually be called native: Quaking Aspen (*P. tremuloides*), Big-Tooth Aspen (*P. grandidentata*), and Balsam Poplar (*P. balsamifera*). These three species often form extensive stands by means of root sprouts. Quaking Aspen is a major component of the forests in northeastern Minnesota.

Cottonwood (*P. deltoides*) is native to western and southern Minnesota along rivers and streams. Certain seedless cultivars of Cottonwood are planted as shelterbelt trees and sometimes mistakenly as yard trees. It does not appear to be naturalized in northeastern Minnesota. Black Poplar (*P. nigra*) is a European species planted as a yard tree as is White Poplar (*P. alba*). These do not seem to be naturalizing but White Poplar does produce suckering roots and may form thickets where it has been planted. Rapidly growing hybrids involving Cottonwood and strains of Black Poplar are being planted on biomass plantations.

### Key

- 1a. Buds viscid, gummy or resinous: 2
  - 2a. Buds viscid, gummy or resinous but not fragrant: 3
    - 3a. Twigs thick, buds large (to 1 cm) with three exposed scales: Cottonwood (*Populus deltoides*)
    - 3b. Twigs thin, buds small (rarely over 0.5 cm), glabrous (rarely downy), more than three exposed scales: Quaking Aspen (*Populus tremuloides*)
  - 2b. Buds extremely resinous, sticky and fragrant, with three exposed scale: Balsam Poplar (*Populus balsamifera*)
- 1b. Buds not viscid, gummy or resinous, silky or tomentose, more than three exposed scales: Big-Tooth Aspen (*Populus grandidentata*)

### Species descriptions

**Cottonwood (*P. deltoides*)** is a large tree to 35 or more meters and 1, sometimes 2, meters across of floodplains and gallery forests along streams in prairies and deserts. It is unlikely *P. deltoides* is actually native in northeastern Minnesota. The cultivar known as "Siouxland" is a male clone (hence, seedless and free of messy cottony seeds) that was planted widely in the past in shelterbelts and even as a shade tree. Groves of these may be seen on old homesteads. Recently, strains of *P. deltoides* have been planted along Interstate 35 in Carlton and St. Louis counties. *P. deltoides* grows rapidly and can attain heights of 25 meters in as many years on rich moist soil. Wetland rating is FAC+.

Leaves of *P. deltoides* are deltoid in outline with deep (2 to 5 mm) serrations. At the leaf base are 2 to 5 small glandular growths. Black Poplar (*P. nigra*), which has similar looking leaves, lacks these glands. *P. deltoides* bark is light gray, deeply furrowed with flat ridges.

**Balsam Poplar (*P. balsamifera*)** has fragrant resinous buds and leaves. This species also grows quite large, 30 meters and 1 meter in diameter but most trees are usually smaller. *P. balsamifera* grows on wetter sites than *P. deltoides* and is more tolerant of wet soils than is Quaking Aspen (*P. tremuloides*). It does poorly on dry soils and on deep peat soils. The wetland rating of *P. balsamifera* is FACW and it is often associated with other FACW and OBL species such as Tag Alder (*Alnus rugosa*), Red Osier Dogwood (*Cornus stolonifera*), Dewberry (*Rubus pubescens*), Red Currant (*Ribes triste*), and Balsam Fir (*Abies balsamea*).

Leaves of *P. balsamifera* are ovate to lance-ovate with fine serrations. The entire leaf is coated with a bronzy resinous deposit. The bark is dark gray, deeply furrowed and can be very thick.



**Left: Terminal bud of *P. deltoides*.**

**Right: Terminal and lateral buds of *P. balsamifera*.**

**Left: *P. tremuloides* terminal and lateral buds.**

**Right: *P. grandidentata* terminal and lateral buds.**

**Quaking Aspen (*P. tremuloides*)** is probably the most common deciduous hardwood in northeastern Minnesota. While abundant on well-drained sites of moderate to good fertility *P. tremuloides* also occurs on wet soils where it may become dominant. *P. tremuloides* can occur in nearly pure stands or be mixed with Paper Birch (*Betula papyrifera*, FAC), Balsam Fir (*Abies balsamea*, FACW), and White Spruce (*Picea glauca*, FACU). *P. tremuloides* has no wetland rating in Reed or the Minnesota list.

Leaves of *P. tremuloides* are heart-shaped, finely toothed, do not have any resinous coatings or glandular projections, and are completely glabrous. White Poplar (*P. alba*, no rating) has leaves that are densely tomentose and appear silvery beneath and in some forms lobed leaves. On young trees, bark of *P. tremuloides* is smooth and gray-green although some clones have very white smooth bark. Older trees develop deeply furrowed bark.

**Big-Tooth Aspen (*P. grandidentata*)** prefers drier soils than *P. tremuloides*. It is rated as a FACU species and often grows with Red Oak (*Quercus rubra*) and Sugar Maple (*Acer saccharum*) and other FACU species such as American Hazelnut (*Corylus americana*), Hop Hornbeam (*Ostrya virginiana*), Basswood (*Tilia americana*), and Bracken Fern (*Pteridium aquilinum*).

Leaves of *P. grandidentata* are somewhat heart-shaped but leaves on new stems are ovate and wooly. The leaves produced on mature branches have deep serrations ("teeth"). There is usually a pair of glands at the leaf base. The bark of *P. grandidentata* is smooth and greenish when young but becomes brown and furrowed on mature individuals.

## ELMS (*Ulmus*)

March 27, 2003

Gary B. Walton

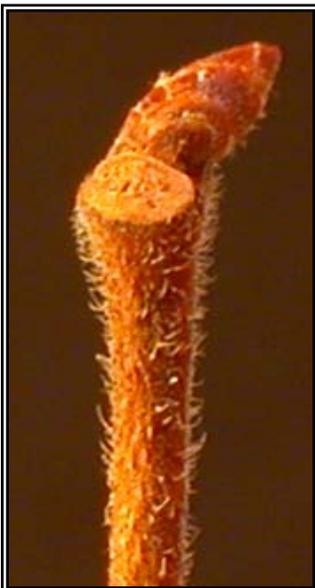
**American Elm (*Ulmus americana*)** has a wetland rating of FACW- and **Slippery Elm (*U. rubra*)** is rated FAC. Both species occur in moist woods, rich swamps, and along river floodplains. American Elm is a large tree to 40 meters while Slippery Elm reaches about 20 meters. Differences between the two species are as follows:

- 1) Fruit (samara): *U. americana* is elliptic and densely ciliate on the wings, the surfaces glabrous and strongly reticulate, about 1 cm. *U. rubra* fruit is suborbicular, pubescent over the seed only, weakly reticulate, about 1.5 to 2 cm.
- 2) Winter twigs and buds: *U. americana* twigs are smooth to short hairy, the buds covered with minute soft curved hairs or glabrous. *U. rubra* twigs have short stiff hairs; the buds are densely covered with red hairs.
- 3) Leaves: *U. americana* are 8 to 14 cm long and smooth above or only scarcely rough to the touch. *U. rubra* leaves are 10 to 20 cm long and very rough above due to the presence on many short stiff hairs. Leaves of both species are oblong to somewhat obovate in shape.

*U. americana* is becoming very scarce in the wild because of Dutch Elm disease a fungus that destroys the plant's vascular system. In the past *U. americana* was planted as a street tree but many of these are succumbing to the disease. *U. rubra* is also susceptible to the fungus.



**Left: *Ulmus americana* twigs and buds with short soft hairs.**



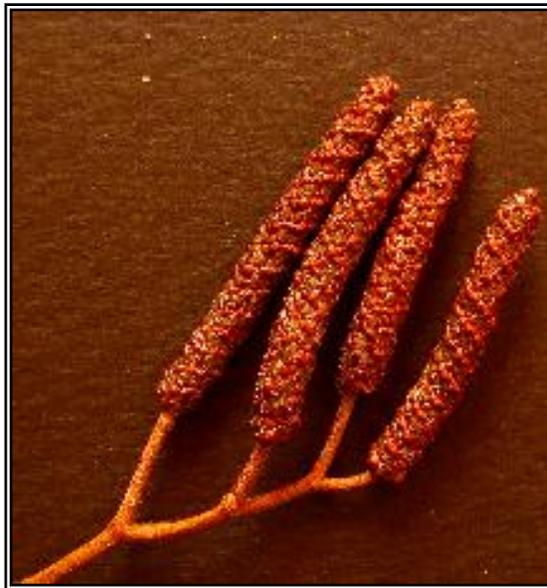
## ALDERS (*Alnus*), HAZELS (*Corylus*), and HOP HORNBEAM (*Ostrya*)

March 29, 2003

Gary B. Walton

**Tag Alder (*Alnus incana* ssp. *rugosa*)** an OBL wetland species is widespread in our region growing in a variety of wetland types and along shores and in open moist forests. It is similar to **Green Alder (*A. viridis* var. *crispa*, FAC)** which occurs in drier situations as well as along rocky shores, in moist ravines, and in forests. *A. incana* ssp. *rugosa* and *A. viridis* var. *crispa* are multi-stemmed shrubs growing to about 4 meters and often colonize disturbed sites. Nodules on the roots contain bacteria that fix atmospheric nitrogen. Both species flower early in the season beginning in April for *A. incana* ssp. *rugosa*. Besides the glutinous leaves, buds and twigs of *A. viridis* var. *crispa* other differences between the two species are as follows:

- 1) Leaves: *A. viridis* var. *crispa* leaves are shiny beneath from a resinous secretion. *A. incana* ssp. *rugosa* leaves are merely whitened. The edges of Green Alder leaves are finely serrated, coarsely in *A. incana* ssp. *rugosa*.
- 2) Buds: Winter buds of *A. viridis* var. *crispa* are sessile but stalked in *A. incana* ssp. *rugosa*.
- 3) Fruiting catkins: Stalked in *A. viridis* var. *crispa*, sessile or short stalked in *A. incana* ssp. *rugosa*.
- 4) Staminate catkins: Sessile in *A. viridis* var. *crispa*, stalked in *A. incana* ssp. *rugosa*.



**Upper Left: Sessile staminate catkins and leaf buds of *A. viridis* var. *crispa*.**

**Upper Right: Stalked staminate catkins of *A. incana* ssp. *rugosa*.**

**Lower left: Stalked bud of *A. incana* ssp. *rugosa*.**



Upper left: Long pedicles of *A. incana* ssp. *rugosa* fruiting catkins.



Lower left: fruiting catkins of *A. incana* ssp. *rugosa* showing short pedicles attaching them to the main twig.

**Beaked Hazel (*Corylus cornuta*, no wetland rating)** and **American Hazel (*C. americana*, FACU-)** are common shrub components of northern Minnesota forests. They occur in a variety of forest types but are most frequently seen in hardwood and mixed conifer-hardwood upland forests. *C. cornuta* may occur in some forested wetlands on slightly elevated hummocks. *C. americana* will also grow along the edges or slightly into some shrub and forested wetlands. When in fruit the two Hazel species are easily identified. *C. cornuta* fruit is enclosed by an elongate enlarged and fused bracts and *C. americana* by frilly enlarged and fused bracts. When not in fruit a convenient way to separate the species is by the pubescence of young twigs. The young twigs of *C. cornuta* are glabrous or have at most a few soft hairs. *C. americana* twigs are densely covered with stiff reddish hairs many of which are gland-tipped.



**Terminal bud of *C. americana*. Twig is densely covered with stiff reddish hairs.**



**Lower left: Terminal bud of *C. cornuta*. No hairs on twig. Lower right: *C. cornuta* twig with some hairs. this twig.**

**Hop Hornbeam (*Ostrya virginiana*, FACU-)** is understory small tree (to 20 meters) of northern hardwoods forests. It is commonly found in Maple-Basswood-Oak associations. A relative of the Birches (*Betula*) its leaves are very similar being oblong to ovate, sharply pointed, and serrate. Unlike the Birches, the bark of *O. virginiana* does not peel off in papery layers. Instead, it is corky and somewhat thick. The fruiting catkins are also different and consist of groups of inflated enlarged and fused bracts each containing a single fruit (achene).



**Above: Bark of *O. virginiana*.**  
**Left: *O. virginiana* twig.**

## BLUEBERRIES (*Vaccinium*)

March 31, 2003

Gary B. Walton

Lowbush Blueberry (*Vaccinium angustifolium*, FACU) and Velvetleaf Blueberry (*V. myrtilloides*, FACW-) are two commonly seen species of blueberry in northeastern Minnesota. As their common names suggests they have blue fruit. They frequently occur together on sites bordering wetlands but *V. angustifolium* is more tolerant of dry soils and *V. myrtilloides* grows in bogs and spruce swamps. While superficially similar the species can be distinguished by the pubescence of their twigs. *V. myrtilloides* twigs are densely pubescent, while *V. angustifolium* twigs are glabrous. Both grow to a maximum of about 0.5 meter. Dwarf Bilberry (*V. cespitosum*, FACU\*) is small (to 20 cm) and occurs on dry, sunny sites and rock outcrops. It is the main larval food source for Nabokov's Blue Butterfly (a variety of *Lycaeides idas*). *V. cespitosum* is not very common or perhaps not very often seen and occurs sporadically across northeastern Minnesota.

The genus *Vaccinium* also includes these red-fruited species: Small Cranberry (*V. oxycoccos*) and Large Cranberry (*V. macrocarpon*) both OBL wetland species, and Mountain Cranberry (*V. vitis-idaea*) which is rated FAC. *V. oxycoccos* and *V. macrocarpon* occur in bogs, fens, and conifer swamps. *V. vitis-idaea* occurs within these boggy habits on dry micro-sites and on acidic rock substrates such as sandstone. Creeping Snowberry (*Gaultheria hispidula*, FACW) resembles *V. oxycoccos* and may grow with it but has white not red berries. Both leaves and fruit of *G. hispidula* contain methyl salicylate giving it a wintergreen aroma.



**Left: Twig of velvetleaf *V. myrtilloides* showing pubescence.**  
**Right: Glabrous twig of *V. myrtilloides*.**  
**(Both photos greatly enlarged.)**

The Blueberries and Cranberries belong to a larger family of plants, the Heath Family (Ericaceae), which includes several shrubs commonly found in bogs. One of these, Labrador Tea (*Ledum groenlandicum*, OBL) is illustrated below. Labrador Tea is a common component of ombrotrophic bogs, fens, and conifer swamps. It often occurs with other members of Ericaceae such as Bog Laurel (*Kalmia polifolia*), Leatherleaf (*Chamaedaphne calyculata*), and Bog Rosemary (*Andromeda glaucophylla*) all rated OBL species. Two related families are the Shinleaf Family (Pyrolaceae) and Indian Pipe Family (Monotropaceae), which include some species found in wetlands particularly *Sphagnum* dominated bogs.



**Underside of *Ledum groenlandicum* leaf showing the rust colored woolly tomentum and inrolled edges of the evergreen leaf. Photo enlarged.**

## VIBURNUM FAMILY (Caprifoliaceae)

March 31, 2003

Gary B. Walton

### Key to the genera of the Caprifoliaceae

- 1a. Trailing woody plants with evergreen leaves: *Linnaea borealis*
- 1b. Trees, shrubs or vines, deciduous leaves: 2
  - 2a. Scales of terminal bud more or less persistent: *Viburnum*
  - 2b. Scales of terminal bud not persistent: 3
    - 3a. Twigs terete with two to four decurrent ridges from the nodes: *Diervilla lonicera*
    - 3b. Twigs not terete: 4
      - 4a. Twigs thick (3 to 5 mm), six, eight, or ten sided, pith large (50% or more of interior), continuous, greenish white: *Sambucus*
      - 4b. Twigs slender, round, pith moderate, brown or white: *Lonicera*

### Species Descriptions of the Arrow-Woods (*Viburnum*)

*Viburnum* is a genus of shrubs to small trees occurring in the understories of forests. The fruit may be red or some shade of blue, and sour, sweet, bitter, or bland depending on the species. Five-petaled white flowers are borne in cymes at the ends of branches. Some species' flowers smell very sweet while others are attractive only to flies. Leaves are maple-like or oblong to elliptic. The margins may be entire or serrate. Four species are regularly seen in northeastern Minnesota.

**Sheepberry (*V. lentago*)** is large shrub to small tree (10 meters) with ovate to oblong leaves. The terminal bud scales are extremely pronounced in this species. The fruit is a purple ellipsoidal drupe. Found in moist woods, roadsides, and wood edges where it forms thickets. Wetland rating of *V. lentago* is FAC+.



**Left: Terminal bud of *V. lentago* with persistent scales. (Photo enlarged)**  
**Right: Lateral buds of *V. lentago*. (Photo enlarged)**

**Downy Arrow-Wood (*V. rafinesqueanum*)** is a shrubby plant (up to 2 meters) with maple-like leaves and blue-black flattened ellipsoidal fruit. *V. rafinesqueanum* has no wetland rating. It occurs in dry woods and rocky woods often forming thickets.



Left: Lateral buds of *V. rafinesqueanum*.  
 Right: Lateral buds of *V. opulus*.  
 (Photos enlarged)

**Squashberry (*V. edule*)** and **Highbush Cranberry (*V. opulus*)** are similar looking shrubs 1-5 meters tall with maple-like leaves and sour red fruit. The most obvious differences are in the inflorescence and the leaves. *V. edule* inflorescence is a cyme like *V. opulus* but lacks the marginally positioned enlarged sterile flowers of the later. The leaves of *V. opulus* are deeply cleft and coarsely toothed. *V. edule* leaves have shallow clefts and fine serrations. Both are rated as FACW species and occur in moist woods, willow shrub swamps, and along streams. *V. edule* becomes more common in the northern parts of Minnesota.

**Honeysuckle (*Lonicera*)**

Seven species of Honeysuckle occur in northeastern Minnesota but only three are common enough to be dominant or co-dominant species. Of the less common species, two are vines (*L. dioica*, FACU and *L. hirsuta*, FAC) found in moist woods and swamps. These have very showy yellowish to purple and yellow to orange flowers, respectively. The third species is a semi-woody shrub (*L. involucrata*, FACU) that is very uncommon and needs cold moist woods. The fourth (*L. oblongifolia*, OBL) occurs only in swamps and bogs. Below are brief descriptions of the three species most frequently seen in uplands and along wetland edges and one often seen on old farms and in urban woods.

**Waterberry (*L. caerulea*)** is a FACW\* species to 1 meter found in rich conifer swamps, wet woods, and the margins of conifer swamps. The twigs of Waterberry are somewhat to very hairy, the oval to oblong leaves are hairy beneath, and it bears blue fruit. **Swamp Fly-Honyesuckle (*L. oblongifolia*)** an OBL species has stems with few or no hairs, oblong leaves that are downy beneath, and produces red fruit. The flowers of both *L. caerulea* and *L. oblongifolia* are yellowish.

**Fly-Honeysuckle (*L. canadense*)** is a scraggly shrub to 2 meters found in dry or moist woods, or sometimes in swamps. It has yellowish flowers followed by red fruit. Its wetland rating is FACU.

**Tatarian Honeysuckle (*L. tatarica*)** is a tall (3 meters) non-native shrub persistent after or escaped from cultivation, mesic sites, road edges, abandoned farms. Pink or white flowers are followed by red fruit. Its wetland rating is FACU\*.



From upper left going clockwise: *Lonicera caerulea* and buds (hairs visible). *L. tatarica* twig and lateral buds with petioles from previous season. *L. canadense* twig with terminal bud and lateral buds. (All photos enlarged.)



### Other Caprifoliaceae Genera and Species

**Yellow Bush-Honeysuckle (*Diervilla lonicera*)** is a small shrub (1.2 meters) found in dry woods, rock outcrops, and dry fields. Occasionally it grows in some forested wetlands on hummocks and other less saturated locations. It has no wetland rating. *D. lonicera* differs from true Honeysuckles (*Lonicera*) in its flower and fruit characteristics. The flowers of *D. lonicera* are bright yellow but turn orange as they mature with all parts nearly similar in size and shape and the fruit is a many seeded dry capsule. The *Lonicera* have irregular flowers and the fruit is a many seeded berry.



**Left: *Sambucus racemosa* ssp. *pubens* twig with two huge lateral buds surrounding small terminal bud.**

**Right: *Diervilla lonicera* twig with lateral buds. Terete form of stem evident.**

**Red Elderberry (*Sambucus racemosa* ssp. *pubens*)** is a coarse shrub about 3 meters tall found in rich woods, along roadsides, and in shrub thickets. The stems are very thick with prominent corky lenticels. The buds are also large. Leaves of *S. racemosa* ssp. *pubens* pinnately compound the leaflet margins serrate. The inflorescence is a panicle of fleshy white five-petaled flowers borne very early in the spring with an unpleasant odor. These are followed by bright red fruits with 3 to 5 seeds enclosed in the juicy pulp. The wetland rating of *S. racemosa* ssp. *pubens* is FACU+.

**Twinflower (*Linnaea borealis*)** is a small trailing plant of moist or dry forests and forested bogs. Although it is not a shrub, tree, or vine it is nevertheless a woody plant not an herb since the stems are lignified. Pairs of nodding pink flared flowers are produced in the early summer and followed by dry indehiscent fruit. The leaves are borne in pairs along the stem and are evergreen. The wetland rating of *Linnaea borealis* is FAC.

**LARGE SHRUBBY AND SMALL TREE MEMBERS**  
**OF THE ROSE FAMILY (ROSACEAE):**  
**Prunus, Amelanchier, Crataegus, Sorbus, Malus**

April 9, 2003

Gary B. Walton

**Plums and Cherries (*Prunus*)**

There are five common species of *Prunus* in northeastern Minnesota: Chokecherry (*P. virginiana*, FAC), Pin-Cherry (*P. pensylvanica*, FACU-\*), Canada Plum (*P. nigra*, FACU-), American Plum (*P. americana*, no rating), and Beach Plum (*P. pumila*, no rating).

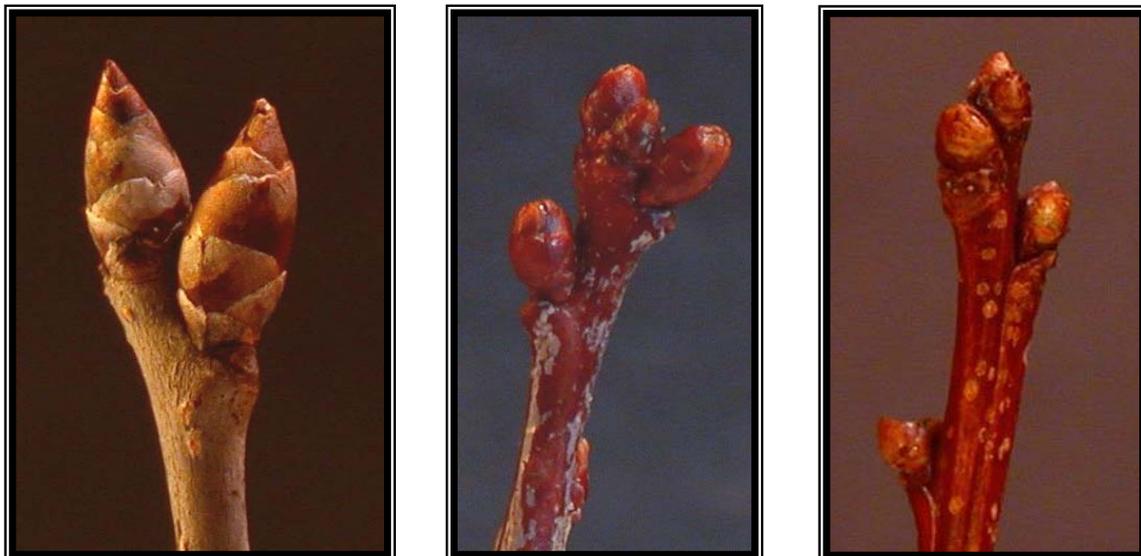
**Chokecherry (*P. virginiana*)** and **Pin-Cherry (*P. pensylvanica*)** are the two species most frequently encountered. Both are small trees (to 6 meters) that often form thickets in moist woods and clearings and in disturbed areas. *P. virginiana* may form root suckers. Both species are relatively easy to distinguish on the basis of the following characteristics:

- 1) Leaves: *P. virginiana* petioles are eglandular; the leaf blades are oblong to obovate, obtuse to short-acuminate, about 5 to 12 cm long with 8 to 11 pairs of lateral veins, the marginal teeth sharply serrate and upward pointing. *P. pensylvanica* petioles are glandular at the summit; the leaf blades are lanceolate to oblong-lanceolate, about 6 to 12 cm long, long acuminate, finely and irregularly serrate, a gland in the sinus of the serrations.
- 2) Flowers/Inflorescence: *P. virginiana* inflorescence is a raceme while that of the *P. pensylvanica* is umbel-like. Flowers of both species are white.
- 3) Fruit: *P. virginiana* black, astringent; *P. pensylvanica* red and sour.
- 4) Buds: *P. virginiana* buds are acuminate, the scales dark with a lighter band, and tend to be single or in pairs at branch tips; *P. pensylvanica* buds are rounded, reddish and tend to be in clumps towards branch tips.

**Canada Plum (*P. nigra*)** and **American Plum (*P. americana*)** are small trees (8 to 10 meters but commonly less) occurring in moist woods and thickets in clearings and roadsides. The fruit of both species is reddish to yellow and edible. They may present some confusion but can be distinguished on the following characteristics:

- 1) Leaves: *P. americana* leaves are sharply and coarsely (often doubly serrate) the teeth callous pointed but not gland tipped. Leaves of *P. nigra* are coarsely and often doubly serrately toothed, the teeth gland tipped and blunt.
- 2) Twigs: *P. americana* is thorny while twigs of *P. nigra* is not or scarcely so.
- 3) Habit: *P. americana* is colonial from root suckers. *P. nigra* is a single stemmed species usually and does not spread by root suckering.

**Beach Plum (*P. pumila*)**, also known as Sand Cherry, is small shrubby species to meters. It grows on sand dunes on Minnesota Point and on rock outcrops. *P. pumila* is a low growing multi-branched sprawling shrub (to 3 meters, usually less). The leaves are oblanceolate, 4 to 10 cm, glaucous beneath, and finely serrate margined. The fruit is a roundish black drupe about 4 to 8 mm, edible and usually palatable.



Above from left to right terminal buds of Chokecherry, Pin-Cherry, and Beach Plum.

**Juneberries and Serviceberries (*Amelanchier*)**

*Amelanchier* are a confusing or confused group taxonomically. Four species may be distinguished but hybridization can blur these distinctions. Most species are rated as FACU. One, Mountain Serviceberry (*A. bartramiana*) is rated as FAC and occurs on rocky sites as well as in mixed coniferous wetlands, moist woods, and stream banks. Unlike other *Amelanchier*, which produce several flowers in a raceme, Mountain Serviceberry produces 1 to 4, or sometimes 5, flowers per raceme or more often only 2 flowers per raceme.

Other species in our area New England Service Berry (*A. sanguinea* including *A. humilis* and *A. huronensis*), Dwarf Serviceberry (*A. spicata*, including *A. mucronata* and *A. stolonifera*), Downy Serviceberry (*A. arborea*), and Smooth Serviceberry (*A. laevis*) are shrubs and trees of upland woods although they may sometimes occur in moist woods and along stream banks. *Amelanchier* often colonize disturbed and open sites such as clearings and road banks and old fields. Some representative specimens of *Amelanchier* are presented below. Species designation is somewhat tentative as identification is more certain when using flowering specimens and then later leafy branches collected from those same specimens.



From left to right:  
*Amelanchier* hybrid of uncertain origin, *A. spicata* and *A. laevis* terminal buds.

**Hawthorns (*Crataegus*)**

*Crataegus* is another genus that is confusing taxonomically although several species are (and can be) recognized in northeastern Minnesota. One species, **Douglas Hawthorn (*C. douglasii*)**, is rare and known from a few sites along the North Shore in Lake and Cook counties. It is tree-like when mature and produces edible soft blue-black fruit with a yellowish interior. *C. douglasii* is rated FAC and usually occurs along stream banks but does grow in drier soil, too.

Two common species with no wetland rating, **Fireberry Hawthorn (*C. chrysocarpa*)** and **Fan-Leaf Hawthorn (*C. flabellata*)** are small shrubs or trees to 8 meters. Both produce edible soft orange to red fruit on thorny twigs. Cockspur Thorn (*C. crus-galli*) is a very thorny tree to 10 meters and produces inedible green to red dry fruit. The wetland rating of *C. crus-galli* is FAC but the other two are not rated. These three species occur along stream banks where they can form dense thickets and sometimes on rock outcrops.

**Downy Hawthorn (*C. mollis*)** may occur in northeastern Minnesota but here it is more often cultivated than wild. *C. mollis* is a small tree to about 12 meters with few or no thorns and bears soft edible red fruit. Its wetland rating is FACW.



From bottom left to right going clockwise:  
*C. crus-galli* (?), *C. chrysocarpa*, *C. flabellata* (?), and *C. mollis* (from an ornamental cultivar). Specimen identification is tentative for the same reasons given for *Amelanchier*.



### **Mountain Ash (*Sorbus*)**

*Sorbus* are small trees from 10 to 15 meters. Two species, American Mountain Ash (*S. americana*) and Showy Mountain Ash (*S. decora*) are native. Rowan Tree (*S. aucuparia*) is introduced from Europe and naturalized in some areas. Only *S. americana* has a wetland rating which is FAC+. The other two species are not rated.

### **Key to *Sorbus* species**

- 1a. Twigs more or less glabrous, winter buds glutinous: 2
  - 2a. Principal scales glutinous on back, inner scales conspicuously brown-ciliate: Showy Mountain Ash (*Sorbus decora*)
  - 2b. Scales glabrous or only sparsely ciliate: American Mountain Ash (*Sorbus americana*)
- 1b. Twigs somewhat to densely white villous, winter buds not glutinous: Rowan Tree (*Sorbus aucuparia*)

### **Apple and Crabapple (*Malus*)**

*Malus* is not native to northeastern Minnesota and represent escapes or persistence after cultivation. *Malus* is largely a European and Asian genus but three species (*Malus coronaria*, *M. angustifolia*, and *M. ioensis*) are native to North America east of the Mississippi. *M. ioensis* is reported from southern Minnesota.

A great deal of variation is present in feral and cultivated *Malus* due to centuries of hybridization and selection. There is no wetland rating for any of the *Malus* species. Where escaped they are usually found in moist fertile soils with good drainage. The three native species are said to grow in woods and thickets.



**From left to right: Terminal buds of *Sorbus aucuparia*, *Sorbus americana*, and *Malus pyrus*.**

## PLANT DEVELOPMENTS TO LOOK FOR

Week of April 13, 2003

Gary B. Walton

Even though the temperatures are in the upper 20's and there is a layer of frozen rain nearly ½ inch thick coating every surface spring is really here and plants are blooming. Just before the icy weather came back, I observed on April 13 the following species in flower:

- 1) Tea-Leaf Willow (*Salix planifolia*)
- 2) Quaking Aspen (*Populus tremuloides*)
- 3) Tag Alder (*Alnus rugosa* ssp. *incana*)
- 4) American Hazel (*Corylus americana*)

Narrow-Leaf Willow (*S. gracilis*) and Pussy Willow (*S. discolor*) should be blooming in another 3 or 4 days. Tussock Sedge (*Carex stricta*) is breaking dormancy as the first shoots broke through the thatch. The upland sedges *Carex houghtoniana* and *C. umbellata* are also beginning to send out new growth as have several cool season grasses. Seeds of Knotweed (*Polygonum aviculare*) have germinated along roadsides.



**Above: Staminate catkins of Quaking Aspen (*Populus tremuloides*) in bloom this week.**

## WHAT'S DEVELOPING

Week of May 1, 2003

Gary B. Walton

Mowed lawns are now greening and Dandelion flowers are blooming along building edges. In the woods and swamps, Quaking Aspen (*Populus tremuloides*, no rating) has already bloomed and its flowers are now developing seeds. Red Maple (*Acer rubrum*, FAC) has begun blooming and some trees are now setting seed. There is a hint of green on many forest trees. A close look at Tamarack (*Larix laricina* FACW) shows that its needles are emerging. Along the stems are clusters of brownish-green staminate and pink pistillate strobili. Superficially, the strobili resemble flowers and function like them by shedding pollen and bearing seeds.



**Left: Pistillate strobili of *Larix laricina*.**  
**Right: Staminate strobili of *Larix laricina*.**

Many species of willows are now coming into flower. Tea-Leaf Willow (*Salix planifolia*, OBL) flowered for about a week after April 14 and is probably still in bloom or coming into bloom further north. In Carlton County *Salix planifolia* is now developing seed and putting forth leaves. Other willows coming into bloom this week include Prairie Willow (*S. humilis*, FACU), Slender Leaf Willow (*S. gracilis*, FACW+), Pussy Willow (*S. discolor*, FACW), and Bebb's Willow (*S. bebbiana*, FACW+). Unlike their relatives the Aspens (*Populus*), which are wind pollinated, the willows are insect pollinated. Chief pollinators appear to be small wasps and flies. Some willows have fragrant flowers and all produce nectar in addition to abundant pollen.

Many herbaceous species are beginning to emerge this week. Bloodroot (*Sanguinaria canadensis*, no rating), Wild Ginger (*Asarum canadense*, no rating), Dutchman's Breeches (*Dicentra cucullaria*, no rating), Trillium (*Trillium grandiflorum*, no rating), Woodland Anemone (*Anemone quinquefolia*, FAC\*), Swamp Saxifrage (*Saxifraga pennsylvanica*, OBL), Golden Ragwort (*Senecio aurea*, FACW), and Marsh Marigold (*Caltha palustris*, OBL) are showing their first leaves of the season. Flowers should be appearing on many of these in the next three weeks. Woodrush (*Luzula acuminata*, FAC) and Stalked Sedge (*Carex pedunculata*, no rating) have begun to bloom.

**Right: Staminate inflorescence of Slender-Leaf Willow (*Salix gracilis*) a common shrub species in many wetlands.**



**Below: A clump of Stalked Sedge (*Carex pedunculata*) in full bloom on April 30, 2003. This species has no wetland rating but occurs in a variety of moist forested habitats throughout northeastern MN.**

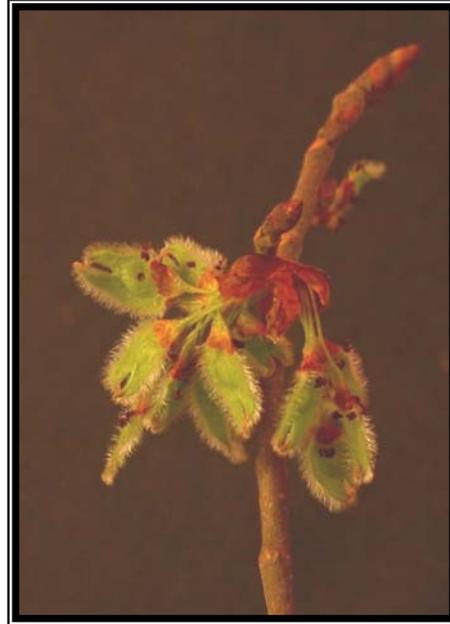


## WHAT'S DEVELOPING

Week of May 19, 2003

Gary B. Walton

A number of tree species have flowered and many are beginning to set fruit. Among them are American Elm (*Ulmus americana*, FACW-), Red Maple (*Acer rubrum*, FAC), and Paper Birch (*Betula papyrifera*, FACU+). Most trees are also leafing out, the Ashes (*Fraxinus*) being the only exceptions, which normally do not start leafing until June.



**Upper left to lower left:**  
*Ulmus americana* flowers.  
**Upper Right:**  
*Ulmus americana* fruit developing about 3 days after flowers bloom.

**Lower Left:**  
*Acer rubrum* staminate flowers.  
**Lower Right:**  
*Acer rubrum* pistillate flowers.



Several species of upland sedges (*Carex*) have also flowered or begun to flower and some are setting fruit. Among the upland sedges in flower or fruit now are *Carex backii*, *C. umbellata*, *C. communis*, *C. pennsylvanica*, *C. peckii*, and *C. houghtonii* (all no rating). Mountain Rice Grass (*Oryzopsis asperifolia*, no rating), an upland grass, has begun to flower and produce new leaves. This clump forming grass of upland hardwood forests and coniferous forests is evergreen and can be readily recognized right after snowmelt. Woodrush (*Luzula acuminata*, FAC-) is in full bloom in forests and upland meadows.



*Carex pedunculata* stem with developing achenes (fruit) enclosed by awned scales. *C. pedunculata*, a common sedge in many upland forests, does occur in dry patches in some forested wetlands.



Wood Rush (*Luzula acuminata*) flowers. Wood Rush is sometimes mistaken for a grass but is actually in the Juncaceae and is a relative of the Soft Rushes (*Juncus*).

A number of spring ephemerals and forest herb species are appearing now. Dutchman's breeches (*Dicentra cucullaria*, no rating), Bloodroot (*Sanguinaria canadensis*, no rating), Spring Beauty (*Claytonia caroliniana*, FACU), and Wild Leek (*Allium tricoccum*, FACU+) are all up in hardwood forests with rich moist soil. Also emerging are Wild Ginger (*Asarum canadense*, no rating), Red Baneberry (*Actaea rubra*, no rating), and various ferns.



Above: *Allium tricoccum* (Wild Leek) growing along transition zone of an upland mixed hardwoods forest (aspen-maple-oak) and red maple-black ash dominated hardwood forested wetland. Although not obvious from this photo, *Allium tricoccum* can be a dominant species.



Left: *Dicentra cucullaria* (Dutchman's breeches, a spring ephemeral, can be a dominant species in the ground layer flora of Northern Hardwoods forest types. It frequently covers large areas in association with other spring ephemerals and forest herbs such as *Dicentra cucullaria*, *Allium tricoccum*, *Sanguinaria canadensis*, *Actaea rubra*, and *Asarum canadense*. By early June the above ground portion of *Dicentra cucullaria* senesces and the plant exists as a cluster of dormant storage tubers until the following spring.



**Upper left: Bloodroot (*Sanguinaria canadensis*) is another spring ephemeral species of upland forests but also occurs along transition zones to wetlands. This particular population is from a Northern Hardwoods forest of Red Oak and Sugar Maple in Duluth, MN. Often a dominant species wherever it grows.**



In wetlands the most conspicuous plant is Marsh Marigold (*Caltha palustris*, OBL) but other species are beginning to emerge and flower in these habitats, too. Violets (*Viola*) and some sedges (*Carex*) can be found now although it will be several weeks before the sedges are mature enough to identify. Most Willows (*Salix*) have finished blooming and are developing fruit.

**Lower left: Marsh Marigold (*Caltha palustris*) in full flower. From a seepage wetland in Duluth's gabbro outcrops.**

**Some other plants to be looking for now:**

Stinging Nettle (*Urtica dioica*, FACW) - just emerging.

Pussytoes (*Antennaria* species, most are no rating or NI) - most are in flower.

Wood Anemone (*Anemone quinquefolia*, FAC) - just emerging but some plants are already flowering.

Wild Plums (*Prunus americana*, UPL, and *P. nigra*, FACU-), Juneberries (*Amelanchier* species), Pincherry (*Prunus pensylvanica*, FACU-\*) - these are in full flower or about to flower.

Gooseberries and Currants- several species are leafed out and at least two are in flower right now (*Ribes triste*, OBL, *R. oxycanthoides*, no rating, and *R. hirtellum*, FACW).

Horsetails (*Equisetum sylvaticum* and *E. arvense*) - these are producing fertile stems and the sterile stems are beginning to emerge.

Honeysuckles- *Lonicera canadensis*, FACU, and *L. caerulea*, FACW\* are in flower. Other species are leafing out.

Red Elderberry (*Sambucus racemosa* ssp. *pubens*, FACU) - in full flower or the buds are about to open.

Spruces (*Picea* species) and Pines (*Pinus* species) - strobilii open or about to open.

Yellow Rocket (*Barbarea vulgaris*, FAC) - in flower.



**Upper left: Inflorescence of Swamp Red Currant (*Ribes triste*).**

**Upper right: Inflorescence of Pincherry (*Prunus pensylvanica*)**

**Lower left: White Spruce (*Picea glauca*) ovuliferous (female) strobilus with bud cap.**

## WHAT'S DEVELOPING

Week of May 25, 2003

Gary B. Walton

Many species of ferns and fern allies have been emerging in the last two weeks. Several species now have fronds large enough to make identification possible. In the appropriate wetland habitats expect to see Ostrich Fern (*Mattuecia struthiopteris*, FACW), Interrupted Fern (*Osmunda claytoniana*, FAC+) and Cinnamon Fern (*O. cinnamomea*, FACW) in their early stages. In addition, in some wetlands and in many forested uplands, Lady's Fern (*Athyrium filix-femina*, FAC) and Oak-Leaf Fern (*Gymnocarpum dryopteris*, FAC) are uncoiling their fronds and Wood Fern (*Dryopteris carthusiana*, FACW-) are slowly emerging from dormancy.



From upper left going clockwise: Uncoiling fronds (crossiers) of Interrupted fern, Ostrich Fern, and Lady's Fern.

In fields, forests, and some wetland types Woodland Horsetail (*Equisetum sylvaticum*, FACW) Meadow Horsetail (*E. pratense*, FACW) and Field Horsetail (*E. arvense*, FAC) are putting forth fertile stems and the first sterile photosynthetic stems. The fertile stem of *E. arvense* is non-photosynthetic and pale brown in color (except in some rare photosynthetic forms) and withers after the spores are shed. That of *E. sylvaticum* is photosynthetic and will live until the end of summer.

Marsh Horsetail (*E. fluviatile*, OBL) should be visible in most parts of northeastern Minnesota now in water-filled ditches, shallow ponds, and along some shores.



With one exception, Clubmosses (*Lycopodium*, *Huperzia*, *Diphasiastrum*) are evergreen. This past winter proved especially damaging to the above ground stems of many species. Lack of snow in conjunction with alternating cold and warm temperatures and low humidity injured many old and large colonies. Certain species of Clubmosses are extremely slow growing. For example, Shining Clubmoss (*Huperzia lucidula*, FAC+) stems 10 cm long may be 8 or more years old.

Botrychium Ferns (*Botrychium* sp.) are either evergreen or ephemeral depending on the species. Some of the evergreen species also suffered from the winter weather but a few individuals managed to pass unscathed such as the St. Lawrence Grapefern (*B. rugulosum*, no wetland rating) shown below. The Moonworts, a group of ephemeral Botrychium Ferns, pass the cold months as dormant subterranean stems. Some species are now beginning to emerge. A photograph of an emerging Daisy-Leaf Moonwort (*B. matricariifolium*, FACU) is shown below.



**Left: Emerging frond of *Botrychium matricariifolium* (Daisy-Leaf Moonwort), an uncommon Moonwort Fern that closely resembles and sometimes grows in association with other rare Moonworts. The actual size of the plant in this photo is 2 cm. Photographed on May 24, 2003.**

**Right: *B. rugulosum*, the St. Lawrence Grape fern is a semi-evergreen fern whose frond persists through the winter. A rare species, it is listed as “Threatened” in Minnesota. Photographed on May 25, 2003.**

In northern hardwoods forests and quaking aspen forests on rich soils forest vernal herbs (aka, “Spring Ephemerals”) are still leafing out and blooming. Spring Beauty (*Claytonia caroliniana*, FACU) is now at peak bloom in many of the hardwood forests of northeastern Minnesota. Other species, in addition to those mentioned last week, that one should expect to see are: Bluebead Lily (*Clintonia borealis*, FAC+), Merrybells (*Uvularia grandiflora*, no rating), Pale Bellwort (*U. sessilifolia*, FAC-), Wild Ginger (*Asarum canadense*, no rating), Wild Sarsaparilla (*Aralia nudicaulis*, FACU), Sweet Coltsfoot (*Petasites palmatus*, FACW), Trillium (*Trillium cernuum*, FAC, *T. grandiflora*, no rating), Baneberry (*Actaea pachypoda*, no rating), Star Flower (*Trientalis borealis*, FAC+), Canada Mayflower (*Maianthemum canadensis*, FAC), Jack-in-the-Pulpit (*Arisaema triphyllum*, FACW-), and Gold Thread (*Coptis groenlandica*, FACW). These violet species are in full bloom: *Viola renifolia* (FACW), *V. mackloskeyi* (no rating, var. *pallens* is OBL), *V. adunca* (FAC-), *V. conspersa* (FACW-), *V. nova-angliae* (OBL), *V. pubescens* (no rating), and *V. sororia* (FAC). *V. cucullata* (OBL), *V. selkirkii* (no rating), and *V. blanda* (FACW-) are coming into bloom.



Upper left: New leaves of Wood Anemone (*Anemone quinquefolia*). These will become green later.

Middle left: Wood Anemone flower.

Middle right: Gold Thread flower (*Coptis groenlandica*).

Bottom left: Mass of Wild Ginger (*Asarum canadense*) leaves.



## WHAT'S DEVELOPING- VIOLETS (*Viola*)

Week of June 2, 2003

Gary B. Walton

Several species of violets (*Viola*) have come into bloom in the last ten days. Most are common species that frequently form significant patches in the ground layer vegetation. Below are photos of the flowers of some of the more common *Viola* species with brief diagnostic descriptions.



*Viola blanda*



*Viola macloskeyi* ssp. *pallens*

*Viola blanda* (FACW-) and *V. macloskeyi* (no rating, however, *V. macloskeyi* ssp. *pallens* is OBL) are two similar species of white-flowered violets. Both species are members of the acaulescent or stemless violets although technically the slender creeping rhizomes that give rise to the leaves and flowers are stems in a horizontal orientation. *V. blanda* and *V. macloskeyi* can be told apart when in bloom by the distinctive characteristics of the lateral petals and vein color of the spur petal.

- 1) Lateral petals - *V. blanda* has forward pointing twisted lateral petals. *V. macloskeyi* lateral petals are at most only slightly recurved and not twisted.
- 2) Vein color of spur petal - Brown-purple in both species but *V. blanda* tends towards more purple coloration.

*V. macloskeyi* occurs in wet habitats such as along the margins of swamps and woodland pools. The subspecies *V. macloskeyi* ssp. *pallens* is listed as an "OBL" wetland species. It differs from the typical species by the lack of or at most the presence of a few, hairs on the inside of the lateral petals.

*V. blanda* prefers moist habitats but is not confined to soils as wet as those near swamps. It frequently grows under evergreen trees such as balsam fir (*Abies balsamea*) and white spruce (*Picea glauca*). Another white-flowered violet species is *V. renifolia* an inhabitant of conifer swamps. Its leaves are strongly reniform (kidney-shaped) and its rhizomes are thick and scaly unlike the previous two species.



*Viola sororia*



*Viola nova-angliae*

These two species also belong to the so-called “stemless” violets. They are variously regarded as separate species by some authors and as variations of the same species by others. *V. sororia* (FAC) and *V. nova-angliae* (OBL) can be differentiated in the field at least by characteristics of the leaves.

- 1) Leaf shape - In *V. sororia* the leaves are cordate at the base and rounded in outline. Leaves of *V. nova-angliae* are somewhat arrowhead-shaped at least early in the season with a deep sinus at the point of petiole attachment.
- 2) Leaf pubescence - Both species are pubescent on leaves, petioles, and flowering stems but *V. sororia* may be glabrous as well.

While *V. nova-angliae* is classed as an “OBL” wetland species it is not at all unusual to find huge colonies of this plant growing in dry soil-filled crevices of exposed rock outcrops with species such as *Corydalis sempervirens* (no rating), *Carex foena* (UPL), and *Danthonia spicata* (no rating). *V. sororia* occurs in moist to wet places such as river floodplains but also as a weed in damp shady lawns.



*Viola canadensis*



*Viola pubescens*

These two violets are typical species of rich moist upland hardwood forests. *V. canadensis* (NI) and *V. pubescens* (FACU-) belong to these-called “stemmed” group of violets. This distinction is based on the leafy stems (which grow from scaly rhizomes!) that bear leaves and flowers as opposed to the scaly rhizomes of the so-called stemless violets. At one time *V. pubescens* was split into three species, *V. pubescens*, *V. pensylvanica*, and *V. eriocarpa* depending on the plant’s pubescence. These distinctions are no longer made.



*Viola conspersa*



*Viola adunca* (FAC-)

Both *V. conspersa* and *V. adunca* are “stemmed” violets. *V. conspersa* (FACW-) is typically found in forests, either deciduous or mixed with conifers in moist to swampy ground or sometimes in moist

clearings and other disturbed sites. *V. adunca* (FAC-) is a species typical of dry upland jack pine (*Pinus banksiana*) forests, clearings, and rock outcrops. Like some of the other species already described, *V. conspersa* and *V. adunca* are superficially similar. Important differences are:

- 1) Flower color - Not always reliable since albino flowers do occur but the flowers of *V. conspersa* are usually pale blue compared to those of *V. adunca*.
- 2) Pubescence - *V. adunca* is nearly always pubescent on the leaves, petioles, and flower stalk (except in *V. adunca* var. *minor*, aka “*V. labrodorica*” which is glabrous and rated FAC\*). *V. conspersa* is entirely glabrous.
- 3) Leaf shape - Lower leaves of *V. conspersa* are strongly cordate to reniform; those of *V. adunca* are barely cordate.

Some other violets, all “stemless”, which occur in northeastern Minnesota are: *V. cucullata* (OBL), a blue-flowered species of swamps, with hairs of the lateral petals ending in club-shaped tips; *V. selkirkii* (no rating), a small species with blue flowers that grows in cool coniferous forests; and *V. lanceolata* (OBL), a white-flowered species that grows in damp sand along the margins of lakes, ponds, and fens. *V. lanceolata* is extremely rare in Minnesota.

---

---

#### Other species coming into bloom this week:

Hawthorns (*Crataegus* species, most are FAC or FACW)

*Viburnum lentago* (FAC+)

Apple (*Malus* species, no rating)

*Salix lucida* (FACW+)

*Thalictrum dasycarpum* (FACW-)

*Carex stricta* (OBL)

*C. backii* (no rating)

*Festuca ovina* (NI)

*Heirochloe odorata* (FACW)

The uncommon Moonwort fern *Botrychium simplex* (FAC) is emerging from dormancy. Its fronds will last about four weeks before shedding spores and withering. The plant will become dormant for the next eleven months.

**Right: *Dicentra cucullaria* (no rating) still visible in some sugar maple forests north of Two Harbors, MN. By mid-June this plant will have completed all processes essential to its survival and the survival of the species. Its leaves and flowering parts will then wither and the plant will become dormant until the following spring.**



## WHAT'S DEVELOPING- EARLY SEASON UPLAND SEDGES

Week of June 8, 2003

Gary B. Walton

Many people think of sedges (*Carex*) as plants found only in wetlands yet there are a number of common species in northeastern Minnesota which grow in upland forests and fields. A few even grow on dry sunny rock outcrops. Many of the upland and FAC species of sedges are early season species, that is, they bloom and set seed between May and mid-June. A few wetland species are also beginning to flower about now such as *Carex lacustris* (OBL), *C. stricta* (OBL), and *C. castanea* (FACW).

*Carex* are difficult to identify and must have fruit for correct identification. A sufficient amount of plant material including mature or nearly mature fruit with leaves, culms and roots or rhizomes should be collected. If roots or rhizomes are not collected than one should at least record in the field notes a description of such. Also, it is important to note whether the plant was loosely cespitose (clumped) or densely cespitose, rhizomatous or a combination of cespitose and rhizomatous. Coloration of the basal leaves and leaf sheaths (often just below the duff layer) should also be noted.

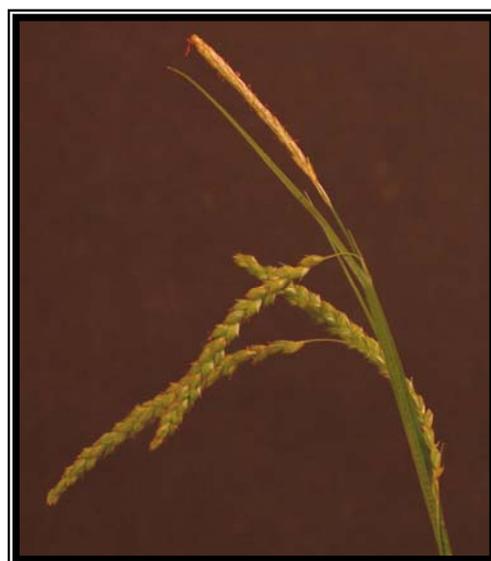
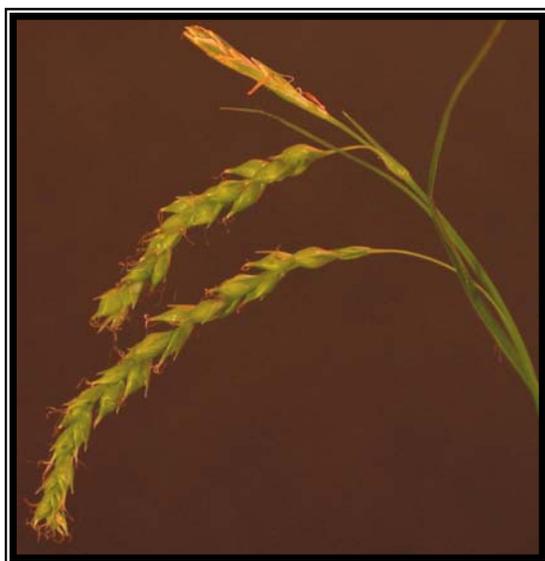
Leaves of *Carex* may be long or short, narrow or broad, smooth or rough, bright green, yellow green or even blue-green. Some species have small bumps on the leaf sheaths. At the apex of the leaf sheath is a hyaline (thin, translucent) membrane that may be smooth, wrinkled or even pigmented with small dots.

*Carex* plants are usually both staminate and pistillate and the flowers may be separate or mixed on the flowering spike. The pistillate flowers are enclosed in an inflated bract called the "perigynium" ("around the female"). Crucial characteristics of the perigynium used to determine species are its length and width ratio, venation ("nerves") of the surface, shape (ovate, elliptic and so on), the presence or absence of a beak, wings on the margins, serrations, and pubescence. These characteristics are minute and cannot be seen by the normal human eye. A 10X or greater magnification is necessary. Measurements of perigynium length and width must be made using a ruler in millimeters. Estimating just doesn't work.

Protruding from the perigynium may be two or three stigmas. It is important to note the number of stigmas first when keying out unknown specimens otherwise you are lost and just guessing. In addition, it is important to note the arrangement of the staminate and pistillate flowers. Are they on separate spikes, mixed on the same spike, or are they on separate parts of the same spike. Subtending each pistillate flower is a scale. Its features such as color and color pattern, shape, and so on are crucial to identification. The shape, color, and ornamentation of the perigynium are also extremely important. The spike itself is subtended by a leafy bract that may be equal to, shorter than, or longer than the spike. It may be erect or lax. Again, these characters must be taken into account when keying specimens otherwise it's just a guess.

Fruit of *Carex* is an achene, a hard, dry, single-seeded indehiscent fruit. Its shape (trigonous or lenticular), the shape of the stigmatic column attached to it (curved, twisted or straight) are additional characteristics used to key sedges to species.

Having said all that, below are photographs (all greatly enlarged) of several upland sedges with brief descriptions to help in identification.



Above are two very similar looking sedges (small loose clumps to 8 dm with purplish basal sheathing leaves) found in dry to moist woodlands, brushy fields, and sometimes in open swamps. On the left is *Carex arctata* (no wetland rating) and on the right *C. gracillima* (FACU\*). Several other small clumping sedges look very similar to these two species including *C. leptoneuria* (FAC), *C. gracilescens* var. *ormostachya*, a rare species (no wetland rating), *C. castanea* (FACW+), and *C. blanda* (FAC). All of these sedges form loose clumps and long drooping culms with separate pistillate (sometimes partially pistillate) and staminate spikes. These other species will be treated in a future update.

Key differences for the two species presented here are:

- 1) Scales - *C. gracillima* scales are ovate to obovate, from half as long to nearly as long as the perigynia, obtuse to short cuspidate. *C. arctata* scales are ovate to oblong, about three-fourths the length of the perigynium, usually tipped with a short cusp.
- 2) Perigynium - *C. gracillima* perigynia are 2.4-3.7 mm long, a third as wide, ellipsoidal, tapering to an obtuse beakless tip, obscurely several nerved. *C. arctata* perigynia are narrowly ovoid, trigonous, 3.2-4.8 mm long, abruptly narrowed to a short stipe, distinctly 2-ribbed, finely but obscurely several nerved and narrowed above to a short beak.



*Carex arctata* perigynia and scales.



*Carex gracillima* perigynia and scales.

*Carex communis* and *C. pensylvanica* are two very similar species but fortunately, both are upland sedges (no wetland rating for either). However, this does not mean that incorrect identification is acceptable. Both occur in deciduous upland woods where they can often form extensive sods of loose clumps growing from 2-5 dm tall. *C. pensylvanica* also occurs quite extensively in prairie and other dry grasslands while *C. communis* is more restricted to hardwood forests. Major distinguishing characteristics are:

- 1) Scales - In *C. communis* these are lance-ovate, about as long as the perigynia, obtuse to acuminate, reddish-purple with a 3-nerved green center and hyaline margins. *C. pensylvanica* scales are castaneous to stramineous and may be longer or shorter than the perigynia.
- 2) Perigynium - *C. communis* perigynia are 2.5-4 mm long, subglobose above a stipe, 2-keeled, abruptly contracted to a long slender beak, and finely hairy. In *C. pensylvanica* the perigynia are 2.6-4.5 mm long, 2-keeled with several nerves, subglobose above a contracted base, abruptly narrowed to a sharp bidentate beak, and short hairy.
- 3) Basal leaves - Smooth and purplish for *C. communis* and fibrillose (appears to be shredded) in *C. pensylvanica*.



**Left: *Carex pensylvanica*.**

**Right: *Carex communis*.**

*Carex peckii* and *C. pedunculata* (both no wetland rating) often occur together in mixed deciduous-coniferous forests but do not closely resemble each other. Both form small loose clumps to 3 dm. *C. pedunculata* clumps are more tufted and looks like a grass for much of the year and has very soft dark green leaves. The perigynia of both species ends in a basal stipe but in *C. pedunculata* this stipe is modified into an eliasome, an oil containing body. The eliasome is attractive to certain ant species, which then collect the perigynia and thus help disperse the seeds of *C. pedunculata*. Ant dispersal is an important means of dispersal for several genera of forest plants including *Viola*, *Dicentra*, *Sanguinaria*, and *Asarum*.



*Carex peckii* (on left) fruiting spikes. The 2.7-4.1 mm long perigynia are 2-keeled and abruptly narrowed into a slender 0.5 mm long beak. *C. pedunculata* (on right) fruiting spike from the basal portion of the culm. The mature culms of *C. pedunculata* tend to droop while those of *C. peckii* are erect or only slightly arched. The perigynia of *C. pedunculata* are 3.5-5 mm long, thinly hairy, 2-keeled, and minutely beaked.



*Carex deweyana* (FACU-) is another common sedge of woodlands. Its arching to drooping fruiting culms resemble those of *C. gracillima* or *C. arctata* but that is about the extent of the resemblance. It is a densely cespitose plant with pale green to silvery spikes. The lowermost spike is surpassed by a large and conspicuous leafy bract (as are *C. gracillima* and *C. arctata*). The scales are hyaline (thin and translucent) or scarious and whitish or light brown with a firm greenish midrib that is sometimes excurrent. The scales may completely cover the 4-5.5 mm long perigynia. The perigynia are lance-elliptic to narrowly elliptic, a fourth to a third as wide as long, faintly nerved to nerveless on both sides, and ending in a sharp bidentate beak.

Two other cespitose or tufted upland sedges are *Carex backii* and *C. umbellata* (no wetland rating for either one). Neither resembles the other or even any of the other sedges described here. *C. backii*, in fact, resembles no other sedges in our region. It may be very rare or even declining.

*C. umbellata* (at right are a pair of fruiting spikes) is densely cespitose sedge of open areas and rock outcrops. Its leaves are stiff and rough. The plant grows to about 1 dm but may spread 4 or 5 dm if left undisturbed. The fertile culms sometimes exceed the height of the leaves but most are concealed towards the base of the plant. The greenish 2-3 mm long perigynia are nearly concealed by the acute to short cuspidate scales. The perigynia are obovoid, finely hairy to glabrous, 2-keeled, and end with a prominent two edged bidentate straight or curved 0.5-1.5 mm long beak.



*C. backii* (left) fruiting spike with long, green, leafy pistillate scales that completely cover the perigynia. No other native sedge looks like *C. backii*. This is a small, tufted plant about 5-10 cm tall with light green leaves. The 4-5.4 mm long perigynia are rounded-trigonous or rhombic-ovoid, inconspicuously nerved, and ending in a conspicuous faintly serrulate 2 mm long beak. Two other related species (*C. jamesii* and *C. wildenovii*) occur farther east and south of northeastern Minnesota.

*C. backii* grows in thickets, open woods, grassy openings, and sometimes on rock outcrops. It is usually difficult to spot in mixed growth of common tufted habit associates such as *Danthonia spicata*, *Carex pennsylvanica*, and *Schizachne purpurascens*.



One last sedge, *Carex houghtoniana* (left showing a close-up of part of the fruiting spike), another upland species (no wetland rating) that is commonly found along sandy roadsides and in gravel pits. It is a rhizomatous species, not a clump-forming or cespitose species.

The 2-4 dm tall culms grow along the length of the rhizome at regular intervals. The terminal staminate spike is 2-4 cm long. The pistillate spikes (from 1-3) are well separated from each other, densely flowered, cylindrical, and 1-4 cm long. The reddish-purple pistillate scales are shorter than the 4.5-7 mm long perigynia. They may be acute or acuminate and end in a prolonged cusp. The perigynia are finely hairy, conspicuously many nerved, and taper into a bidentate beak two-fifths the length of the body.

## **SEDGE AND GRASS TERMINOLOGY**

June 15, 2003

Gary B. Walton

The sedges and grasses are both difficult groups of plants to master. Adding to the difficulty is the specialized language used to describe plant organs critical to their identification. Below are several of the most frequently used terms with definitions. References are also provided.

### **SEDGES**

Perigynium - A membranous sheath surrounding the pistillate flower (and later the fruit) of a sedge.

Achene - An indehiscent (does not open by means of a suture, pores, lids) fruit with a single seed.

Beak - In some sedges an elongation of the mature perigynium. This may be variously ornamented with serrations.

Scale - A small leaf subtending a flower (either the pistillate or staminate) of a sedge.

Spike - An elongate, unbranched, indeterminate inflorescence with sessile flowers.

Spikelet - A small spike consisting of small reduced flowers inserted alternately along the rachilla.

Rachilla - The axis of the spikelet in a sedge.

Bract - A leaf subtending the inflorescence.

Culm - A stem of a monocot. Usually refers to the flowering stem.

Blade - The flattened portion of the sedge leaf.

Sheath - The elongate tubular portion of the sedge leaf that surrounds the culm or other leaves not yet fully developed.

Rhizome - A subterranean horizontal stem.

### **GRASSES**

Glume - One of two bracts in a pair at the base of a grass spikelet.

Lemma - The next bract above the glumes. Usually subtending a flower with the palea.

Palea - The bract that immediately subtends a grass flower.

Spike - An elongate, unbranched, indeterminate inflorescence with sessile flowers.

Spikelet - A small spike consisting of small reduced flowers inserted alternately along the rachilla.

Rachilla - The axis of the spikelet in a grass.

Awn - A hair or bristle terminating certain plant organs such as one of the leafy bracts of a grass plant.

Caryopsis - The single-seeded dry indehiscent fruit of the grass. Formed by the fusion of the seed and the pericarp (fruit wall).

Culm - A stem of a monocot. Usually refers to the flowering stem.

Blade - The flattened portion of the grass leaf.

Sheath - The elongate tubular portion of the grass leaf that surrounds the culm or other leaves not yet fully developed.

Ligule - The membranous projection at the junction of the sheath and blade in grasses.

Rhizome - A subterranean horizontal stem.

Stolon - An aboveground horizontal stem, the roots at the nodes and frequently at the tip.

### **References:**

Edward G. Voss. 1972. Michigan Flora Part 1, Gymnosperms and Monocots. Cranbrook Institute of Science and the University of Michigan Herbarium.

James Payne Smith, Jr. 1977. Vascular Plant Families. Mad River Press. Eureka, CA.

## ANTENNARIA (PUSSY-TOES)

June 16, 2003

Gary B. Walton

*Antennaria* (Pussy-Toes) are members of the Sunflower Family (Asteraceae). The taxonomy of *Antennaria* is much debated by specialists. While there are (apparently) only two common species in northeastern Minnesota, they are extremely variable in form. Some of these variations are environmental but others are definitely genetic. Populations can vary on characters of leaf shape, leaf size, leaf pubescence, and flower or inflorescence traits. *Antennaria* are clonal plants, spreading by stolons, and this helps to create large populations of genetically and phenotypically similar plants. *Antennaria* also maintain genetic uniformity another way: by seeds. Although *Antennaria* is dioecious, it seldom outcrosses and pollen is not even required for the development of seeds. This ability to produce seeds without pollen is called "apomixis". The seeds are essentially vegetative propagules and will produce plants identical to the plant that produced them. Apomixis has been documented in other Asteraceae such as Hawkweed (*Hieracium*) and Dandelion (*Taraxacum*). Hybridization between *Antennaria* species is suspected in clones that are polyploid and apomictic.

The two recognized northeastern Minnesota species are *Antennaria neglecta* and *A. plantaginifolia* (more properly, *A. parlinii*). Both *A. neglecta* and *A. plantaginifolia* are upland species that grow in dry soils and rock outcrops either in full sun or partial shade with little competition from other plants. Another species also occurs, *A. rosea* (also known as *A. microphylla*), but it is extremely rare. *A. neglecta*, *A. rosea*, and *A. plantaginifolia* are similar but can be told apart using the following characters:

- 1) **Leaves:** Pubescent in *A. neglecta* and *A. plantaginifolia*, the pubescence wearing off over the season. Extremely gray pubescent in *A. rosea*. *A. plantaginifolia* has three very prominent longitudinal veins on the underside and its leaves are 1.5 cm wide or more. *A. neglecta* has one (or sometimes just barely three) longitudinal vein visible. Its leaves are less than 1.5 cm wide. The leaves of *A. rosea* are one veined and under 1 cm wide.
- 2) **Flower heads:** These appear pink to red in *A. plantaginifolia* due to the pigmented bracts (the pappus) in between individual flowers. *A. neglecta* flower heads are white or dingy. The involucular bracts of *A. neglecta* and *A. plantaginifolia* are green but it in *A. rosea* they are tinted red.

Depending on location *A. neglecta*, *A. rosea*, and *A. plantaginifolia* are in bloom now or beginning to shed seeds.



**Left: Inflorescence of staminate flowers (*Antennaria neglecta*).**



*Antennaria neglecta* leaves (above left) and inflorescence of pistillate flowers (above right).



*Antennaria plantaginifolia*  
leaves (left) and inflorescence  
of pistillate flowers (right).



*Antennaria rosea* leaves (left) and inflorescence of pistillate flowers (right).

## WHAT'S DEVELOPING- WILLOWS (*SALIX*)

Week of July 6, 2003

Gary B. Walton

Willows (*Salix*) are a conspicuous component of many wetland types- hardwood or conifer swamp, alder thicket, and especially, shrub carr. Many species of willows also occur along streams, rivers, and lakes where their fibrous root systems and thick branching patterns are important erosion controls. Willows are forage for insects including the larva of some species of *Cecropia* moths. The flowers of Willows produce pollen and nectar and are an early season food source for numerous small wasps and solitary bees. Warblers use shrubby willows as nesting sites. All Willows contain salicylic acid an anodyne and anti-inflammatory compound related to aspirin.

Most Willow species in Minnesota are shrubs to small trees but a few do attain large sizes, notably the Black Willow (*Salix nigra*) and some introduced species (*S. petandra*, *S. fragilis*). This week's phenology update will center on shrub and small tree species.

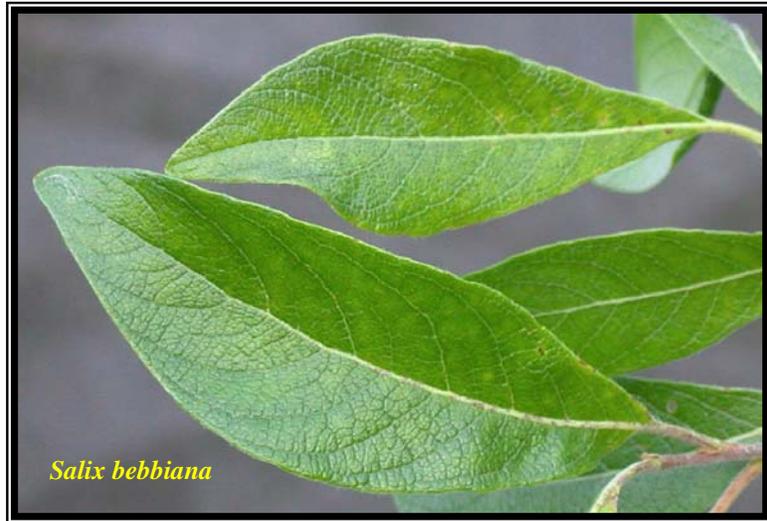
Willows may be difficult to identify owing to variability of leaf morphology and because of occasional hybridization that introduces new characteristics. Also, some species are composed of two or more varieties or at least forms with some more or less consistent characteristics. While many keys depend upon flowering or fruiting material these become less useful by mid-summer. During the summer it is better to determine species by leaf characteristics. Useful references include Manual of Vascular Plants of Northeastern United States and Adjacent Canada (Gleason and Cronquist 1991) and Michigan Flora Part II Dicots (Voss 1985).

On the following pages are several commonly found shrub willows and small tree willows from our area.



**Sandbar Willow (*Salix exigua*, OBL)** is a species often found near water on sandbars, mudflats, and riverbanks. It is a multi-stemmed colonial shrub from 1 to 5 meters. The leaves of *S. exigua* are linear, 5-14 cm by 5-12 cm, often acute at both ends with a very short petiole. The leaf margins are toothed with irregularly spaced spinulose teeth. The underside of the leaf is a paler green than the upper side. The young twigs of *S. exigua* are very slender and brown to reddish-brown to red. Many willows flower in April and May before or as their leaves emerge but *S. exigua* flowers in late June when in full leaf.

**Meadow Willow (*Salix petiolaris*, syn. *S. gracilis*, FACW+)** resembles *S. exigua* but is distinguished by its longer petiole (5-15 mm) and subtire to glandular serrate leaf margins and leaves 4-10 cm long by 0.8-3 cm. Young leaves are densely sericeous but soon become glabrous. Very rarely the pubescence will persist. *S. petiolaris* is a clumping shrub or sometimes a small tree from 1 to 7 meters found in meadows, shrub carr, along streams, lakes, and in wet roadside ditches. The middle photo shows the upper surface of *S. petiolaris*, the right the lower surface and the glandular-serrate leaf margins. Both leaves came from the same branch. *S. petiolaris* flowers in the early spring.



**Bebb's or Beaked Willow (*Salix bebbiana*, FACW+)** is one of the small tree willows often growing to 5 meters. It may have one or a few stems. This species is probably often misidentified as **Pussy Willow (*S. discolor*, FACW)**, illustrated on bottom of the page, another small tree willow with which it often grows. Besides differences in the winter buds (large and dark in *S. discolor*, small and pale in *S. bebbiana*) there are obvious differences in the leaves. Leaves of *S. bebbiana* are elliptic to broadly rhombic with subentire to undulate-crenate margins, 4-8 cm by 1.5-3 cm. The upper surface of the leaves is dark green, lighter and somewhat hairy below with reticulate venation (see the upper photograph on this page). Leaves of *S. discolor* are elliptic to elliptic-lanceolate with subentire to undulate-crenate margins, 4-8 cm by 1.5-3.5 cm, dark green above and glaucous and glabrous below.



**Left: Pussy Willow (*Salix discolor* leaf showing glabrous and glaucous underside and undulate-crenate margin.**



**Diamond-Leaf or Tea-Leaf Willow (*Salix planifolia*, OBL)** showing the upper leaf surface (upper left photograph) and lower leaf surface (lower left photograph). *S. planifolia* is a small shrub or multi-stemmed small tree to 3 meters. Its leaves are glaucous below thus resembling *S. discolor*. It differs by its glossy upper leaf surfaces, rhomboidal leaves with largely entire margins, and small stipules. Leaves, which are crowded on the twigs, measure 3-6 cm by 1-2.5 cm on petioles from 4-10 mm.

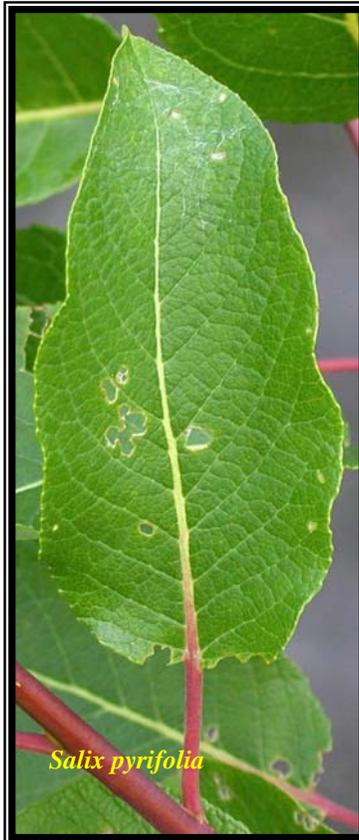


**Prairie Willow (*Salix humilis*, FACU)** is our only upland willow species. While sometimes misidentified as Pussy Willow (*Salix discolor*, FACW) the differences are very distinct. *S. humilis* is a very pubescent plant with leaves and young twigs lightly to densely tomentose. The tomentum on the yellow-brown young twigs may persist for two growing seasons. The usually leathery textured leaves are oblanceolate to narrowly obovate and measure 3-15 cm by 1-3 cm.



**Left: Undersides of leaves of Shining Willow (*Salix serissima*) showing long acuminate tip.**  
**Right: Undersides of leaves of Autumn Willow (*Salix lucida*)**

**Shining Willow (*Salix serissima*, FACW+)** and **Autumn Willow (*Salix lucida*, OBL)** are similar and key out next to each other in most leaf keys. The leaves of *S. lucida* and *S. serissima* both have glandular petioles, glandular serrate margins, and lighter colored lower surfaces compared to upper surfaces. In *S. serissima* the leaves are dark green above and subglaucous below, acute to short acuminate tipped, and measure 5-10 cm by 1-3 cm. Leaves of *S. lucida* are shiny green above and pale below, the leaf tips long acuminate and measure 5-15 cm by 1.5-4 cm. Serrations of *S. serissima* are finer than are those of *S. lucida*. In addition, stipules of *S. lucida* are large (2-5 cm), reniform and persistent. Stipules of *S. serissima* are minute and frequently soon deciduous.



**Balsam Willow** (*Salix pyrifolia*, FACW+) is easily recognized by its reddish new growth and petioles, leaves with glaucous and nearly glabrous undersides and shiny green upper surfaces. The margins are often glandular serrate, the leaf base rounded to rounded-cordate. *S. pyrifolia* is a shrub to small tree (4-6 meters) that grows in conifer swamps and some *Sphagnum* moss dominated wetlands with good ground water flow through. It is often associated with *S. planifolia*.

---

**Some plants in bloom this week:**

Canada Blue-Joint Grass (*Calamagrostis canadensis*, OBL)  
 Giant Manna Grass (*Glyceria maxima*, OBL)  
 Quackgrass (*Agropyron repens*, FACU)  
 Canary Grass (*Phalaris arundinacea*, FACW)  
 Porcupine Grass (*Stipa spartea*, no rating)  
 Golden Sedge (*Carex aurea*, OBL)

Woolly Sedge (*C. lanuginosa*, obl)

Fringed Sedge (*C. crinita*, OBL)  
 Wool Rush (*Scirpus cyperinus*, OBL)  
 Tufted Bulrush (*S. cespitosus*, OBL)

Neat Spikerush (*Eleocharis nitida*, OBL)  
 Baltic Rush (*Juncus balticus*, OBL)  
 Everlasting Sunflower (*Heliopsis helianthoides*, no rating)  
 Golden Senecio (*Senecio aureus*, FACW)  
 Ox-eye Daisy (*Chrysanthemum leucanthemum*, no rating)  
 Black-eyed Coneflower (*Rudbeckia hirta*, FACU)  
 Evening Primrose (*Oenothera biennis*, FACU)

Red Clover (*Trifolium pratense*, FACU+)

Sulfur Cinquefoil (*Potentilla recta*, no rating)  
 Silvery Cinquefoil (*P. argentea*, FACU)  
 Tall Cinquefoil (*P. arguta*, FACU-)  
 Pinnate Cinquefoil (*P. pennsylvanica*, no rating)  
 Prickly Pear Cactus (*Opuntia macrorhiza*, no rating)  
 Dogbane (*Apocynum androsaemifolium*, no rating)  
 Common Milkweed (*Asclepias syriaca*, no rating)  
 Swamp Milkweed (*Asclepias incarnata*, OBL)  
 Low Bindweed (*Calystegia spithamea*, no rating)  
 Early Goldenrod (*Solidago juncea*, no rating)  
 Gray Dogwood (*Cornus racemosa*, FACW-)  
 Spotted Hemlock (*Cicuta maculata*, OBL)

Cow Parsnip (*Heracleum lanatum*, FACW)  
 Heal-All (*Prunella vulgaris*, FAC)

Shinleaf (*Pyrola elliptica*, no rating)  
 Pink Wintergreen (*P. asarifolia*, FACW\*)

## SCOURING RUSHES AND HORSETAILS (*EQUISETUM*)

July 19, 2003

Gary B. Walton

There are 15 species of *Equisetum* worldwide with 9 native to Minnesota. The genus *Equisetum* is a lone remnant of the ArthropHYta, a group of spore bearing plants that was a dominant part of the flora between 350 and 230 million years ago. Some extinct species in the ArthropHYta now known only as fossils attained heights of 30 meters but others were more modest in size. Living species today are for the most part well under 1 meter in height except for *E. telmateia*, which may grow as tall as 3 meters. Most of our species of *Equisetum* grow in moist forests, fields, and disturbed sites such as railroad grades and road edges. A few occur in wetlands almost exclusively (*E. fluviatile*, *E. palustre*) with one (*E. variegatum*) restricted to neutral to alkaline pH especially calcareous soil and water. *E. fluviatile* (OBL) and some other species often produce nearly pure stands under favorable conditions. Several terrestrial species (*E. arvense*, *E. sylvaticum*, *E. pratense*, *E. laevigatum*, and *E. hyemale*) can be dominant in the ground layer flora. *E. scirpoides* occurs sporadically in northern Minnesota but is often locally abundant.

The *Equisetum* may be divided into two subgenera: *Hippochaete* (Scouring Rushes) which have evergreen, usually branchless or irregularly branched stems, and *Equisetum*, which have deciduous stems that may be branched or unbranched; those with branches bear them in regular whorls. *Equisetum* species may be distinguished from one another using characteristics of the stem (i. e., branched or not, smooth or rough, round or angular, a large central cavity or a small central cavity, number of ridges), branching characteristics (regularly branched or not, branches divided or not), scale leaf characteristics, whether the stems are evergreen or not, and whether the spore bearing stems are photosynthetic and persistent or non-photosynthetic and ephemeral (i. e., dimorphic stems). All *Equisetum* have silica spicules along the stems and branches that make some species feel very rough to the touch. These can be seen using a 10X or greater magnification. While it may not seem obvious *Equisetum* do have leaves. These are reduced to small scales at stem and branch nodes. Since they are so small, they play almost no role in photosynthesis, which is carried on by the stems and branches. At 10X or 20X magnification the stomata can be seen in the grooves along the stems of an *Equisetum*. Good references on *Equisetum* include Tryon's (1980) Ferns of Minnesota and Gleason and Cronquist's (1991) Flora of Northeastern North America. The most recent update on North American ferns and fern allies is the Flora of North America Volume 2 (1993).

**SUBGENUS HIPPOCHAETE: *Equisetum laevigatum*, *E. hyemale*, *E. variegatum*, *E. scirpoides***



**Left: *Equisetum laevigatum* rush stem showing deciduous scale leaves at the nodes.  
Right: Spore cone of *Equisetum laevigatum*. Note deciduous scale leaves.**

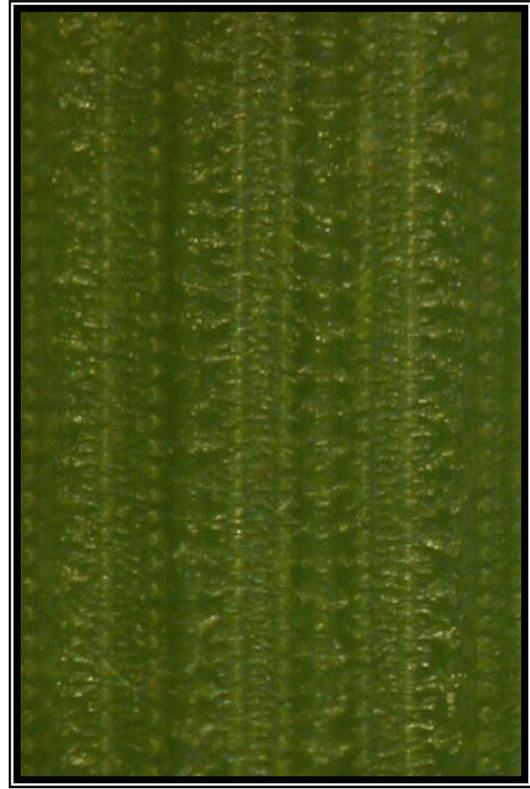
**Smooth scouring rush (*Equisetum laevigatum*, FACW)** seldom branches unless the stem tip is damaged. It is very similar to rough scouring rush (*E. hyemale*, FACW-) including the large central cavity of the stem (1/4-1/3 the stem diameter) surrounded by smaller vallicular cavities (1 per ridge) but differs by its smooth stem with low transverse ridges (see photographs on next page), green sheaths at the nodes with no basal black banding, and dark scarious margined teeth (reduced leaves on the stem) that are soon deciduous. The spore cone of both species is on a short peduncle and often apiculate.

The stems of *E. laevigatum* are deciduous in cold climates but remain green in milder climates. Branching is uncommon and occurs when the tip of the stem is damaged. Often there is a cluster of stems growing from one point out of the ground. *E. laevigatum* grows to 30 cm to 1 meter and occurs in moist soils with little woody vegetation hindering sunlight. Large colonies can be found, for example, in ditches along railroad right-of-ways along with *E. hyemale*. These two species hybridize producing *E. X ferrissii* (FACW).

*E. laevigatum* is a North American species occurring largely south of Canada and north of Mexico from the Pacific coast to Texas, north to British Columbia and southern Ontario, and east to New York and West Virginia.



Stem of *Equisetum laevigatum* (25X)



Stem of *Equisetum hyemale* (25X)

**Rough scouring rush (*E. hyemale*, FACW-)** is similar to *E. laevigatum* (hollow stems, no regular branching, spore cone short pedunculate and apiculate) but has a rougher stem surfacing owing to the presence of coarse silica spicules along the stem ridges (see above left photograph). Also, there is a conspicuous basal black band on stem sheaths of mature stems and the scale leaves are irregularly persistent (photograph at lower left). *E. hyemale* is a colonial species growing 20 cm to 1.5 meters and spreads rapidly by rhizomes in wet sandy or clay soils, in railroad ballast where the grade passes through wetlands, and along streams and moist slopes. It is somewhat tolerant of shade unlike *E. laevigatum*. *E. hyemale* is circumboreal in distribution.



**Node of *Equisetum hyemale* (rough scouring rush) showing basal black band of sheath and persistent scale leaves.**

**Variegated scouring rush (*Equisetum variegatum*, FACW)** is an evergreen scouring rush with ascending tufts of erect stems to 30 cm in height and stem diameters from 1 to 2.5 mm. The stem is 5-12 ridged with two rows of silica spicules per ridge and a single line of stomata. The central cavity is small, roughly  $\frac{1}{4}$  the stem diameter but larger than the surrounding vallicular canals (1 per ridge). The nodal sheaths are green with a black apical band and flared upwards. The teeth have a 2-ridged dark midstripe and end in a long but soon deciduous hair-like tip. Cones are sessile, apiculate, and less than 1 cm long maturing in late summer or may overwinter shedding spores in the spring. *E. variegatum* is a circumboreal species occurring in wet sands (such as gravel pits), sandy shores, and bogs. It is apparently somewhat calciphilic or at least prefers a neutral pH.



**Left: Spore cone (fully opened) of *Equisetum variegatum*.**

**Right: Close up view of *Equisetum variegatum* node.**



*Equisetum scirpoides*

**Dwarf or wiry scouring rush (*Equisetum scirpoides*, FAC+)** is a very distinctive species of scouring rush with small (7-25 cm by 0.5-1mm), twisted, wiry stems that resemble a tangle of green wires. The stems are 3-ridged, tuberculate and deeply concave. Fertile stems are tipped with a 3-5 mm sessile cone. There are 3 large vallicular cavities but no central cavity in the stem. The flaring nodal sheaths are green at the base with a black band above. The three teeth are scarious margined and end in a deciduous tip. *E. scirpoides* is a circumboreal species found in moist woods and somewhat swampy woods including coniferous woods. *E. scirpoides* seems to be somewhat scarce compared to our other native *Equisetum* species and seldom forms large colonies.

SUBGENUS *EQUISETUM*: *E. palustre*, *E. arvense*, *E. pratense*, *E. sylvaticum*, *E. fluviatile*

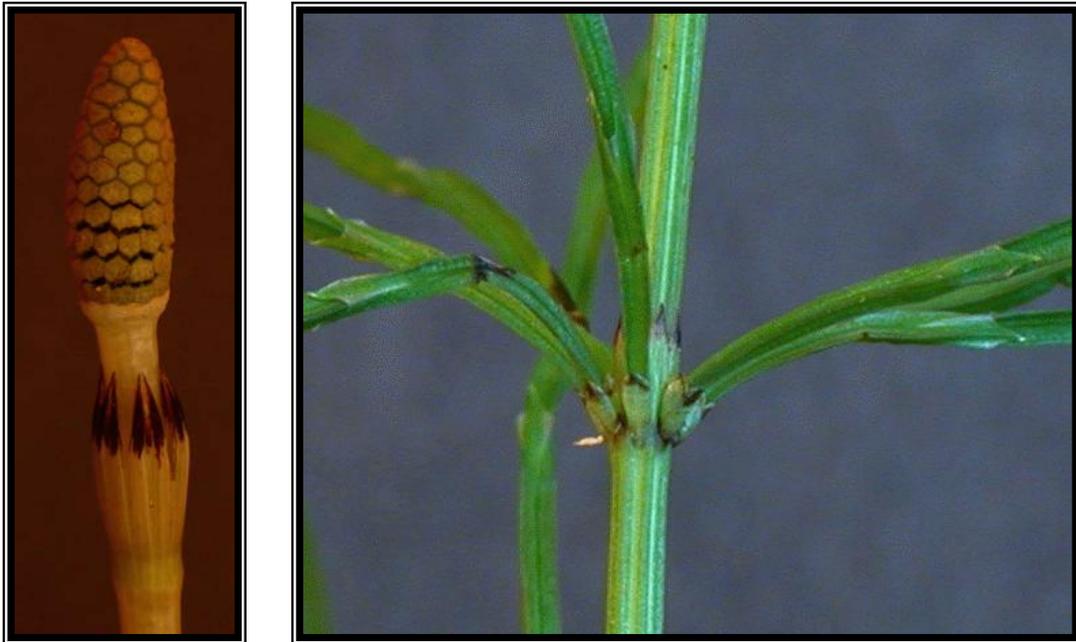


**Left: Node and branches of *Equisetum palustre***  
**Right: *Equisetum palustre* spore cone.**

**Marsh Horsetail (*Equisetum palustre*, OBL)** has stomata in a single band along the stem grooves thus clearly separating from Field Horsetail (*E. arvense*, FAC), which has stomata in two bands. In addition *E. palustre* fertile stems are photosynthetic and not ephemeral. The small central cavity (about 1/3 stem diameter) is about equal in diameter to the surrounding vallecular canals. Sheaths at the nodes are long (4-9 mm by 2-5 mm wide) with 5-10 dark teeth bordered by white scarious margins. Hollow, spreading branches with 4-6 ridges begin near the mid-stem but do not always continue to the end or may be absent altogether. The first internode of each branch is shorter than the subtending leaf sheath, but all others extend beyond their leaf sheaths.

Species that might be confused with *E. palustre* are *E. arvense* and *E. fluviatile*. *E. arvense* has dimorphic stems; the fertile are non-photosynthetic and wither after spore dehiscence. Also, the first branch internode is longer than the subtending sheath. **Water Horsetail (*E. fluviatile*, OBL)** grows in habitats similar to or near habitat preferred by *E. palustre* and the two might be confused. *E. fluviatile* stems are hollow with the central cavity almost the total stem diameter and no vallecular canals. *E. palustre* and *E. fluviatile* can hybridize. The progeny look very much like *E. palustre* but the branches are thin, long and somewhat lax. *E. palustre* and *E. fluviatile* are circumboreal species.

**Field Horsetail (*Equisetum arvense*, FAC)** is an extremely variable species morphologically. In most instances, environmental conditions contribute to this variability. Typically, the plant consists of a single upright stem with undivided branches but some populations may have two or more stems in clusters and resemble small bushes. In addition, there are populations with nodal branches that are 4-angled and others 3-angled. Some populations have very compact branching structure while others have loose branching and elongate branches. Very rarely found are populations with some multiple branching. Still, this is not a difficult plant to identify. The stems are from 15 to 60 cm tall, with 10 to 14 ridges. There are two rows of stomata in the furrows between the ridges. This species is best distinguished from others by the first branch internode which is longer than its associated stem sheath (shorter in *E. palustre* and *E. pratense*). *E. arvense* has dimorphic stems, a fertile non-photosynthetic stem and a sterile photosynthetic stem. There are occasionally some populations with stems both fertile and photosynthetic (named "*E. arvense* forma *campestre*" by some authors). *E. arvense* is widely distributed across the planet.



**Left: Spore cone (not open) of *Equisetum arvense*. Note the brown color of the fertile stem.**  
**Right: Node of *Equisetum arvense* showing first branch internodes longer than subtending sheaths.**



**Left: Portion of fertile stem of *Equisetum sylvaticum* showing forking branches, nodal sheath and basally connate persistent teeth.**  
**Right: Spore cone (opening) of *Equisetum sylvaticum*.**

**Woodland Horsetail (*Equisetum sylvaticum*, FACW)** is a common species component in many moist and wet forests, conifer swamps and hardwood swamps. It is the only species with branches regularly forked, all others having either no branches or branches composed of a single axis. The forked branches with their flared nodal sheaths and scale leaves give *E. sylvaticum* a lacy appearance. Other key characteristics include the sharp hooked spicules (rounded or otherwise not hook-like in other species), persistent and basally fused sheath teeth, and the 4- or 5-angled branches. *E. sylvaticum* like many northern Minnesota plant species has a circumboreal distribution.



A similar species to *Equisetum sylvaticum*, and often found with it in the same habitats, is **Meadow Horsetail** (*E. pratense*, FACW), a misnomer since this species is more at home in shaded forest floors than sunny meadows. *E. pratense* has thin 3-angled branches that do not fork. The appressed nodal sheaths with persistent basally connate teeth with hyaline margins and a darker mid-stripe are also key characteristics. Another circumboreal species of woods, stream banks and similar moist habitats. The sterile and fertile stems are similar. Circumboreal distribution.



Above left: Nodes and branches of *Equisetum pratense*  
Lower left: *Equisetum pratense* plant.

## **RARE PLANTS OF NORTHEASTERN MINNESOTA- PART 1**

July 21, 2003

Gary B. Walton

There are about 1300 plant species in northeastern Minnesota. This number includes native species as well as adventive, introduced, and escaped species. Among the native species is a subset of plants considered rare or uncommon at least within those parts of the species' ranges that include Minnesota. Rarity is a complicated concept and is not limited to small population sizes or small areas of distribution. Some rare species are widespread across North America but consist of scattered small populations that are constrained to uncommon habitat types such as calcareous fens. Others may be locally common but rare in other parts of their range.

Over the next few weeks there will be short write-ups on some of the rare plant species of northeastern Minnesota. The species chosen were selected because it was felt they would be among those most likely to be encountered in wetland delineations.

### **Conservation and Plant Collecting**

Many rare plant species populations are small often numbering only a few dozen or even less individuals for any given site. In some cases the next nearest population or even next nearest individual member of the same species exists many miles away effectively isolating them from genetic exchange. Thus, careless collecting of specimens could have potentially harmful effects on the genetic diversity of such small populations. In most cases it is best to take several clear photographs and collect detailed notes on the plant's morphology and habitat rather than collect a specimen. When or if a specimen is needed then only the minimal amount of material should be collected. The plant should not be killed by uprooting it or by removing too much of the plant body. A plant specimen is not trophy for personal glory but a piece of scientific data to be shared. A small portion of the stem that includes some flowering or fruiting parts with a leaf or two is usually quite adequate. Occasional large populations may seem to be the exception to the rules but numbers of specimens collected from even large populations should respect the species' rarity and unique position in the state's flora. Finally, any collecting of rare plants for any purpose requires permits from the Minnesota Department of Natural Resources. Collecting rare plants on Federal land also requires permits. One should never collect from private property without permission of the owner.

### **Terms Used**

Endangered (E) - threatened with extinction throughout all or a significant portion of its range within Minnesota.

Threatened (T) - likely to become endangered in the near future throughout all or a significant portion of its range within Minnesota.

Special Concern (SC) - extremely uncommon in Minnesota, or has unique habitat needs and so is need of monitoring. This category includes species on the edge of their native range in Minnesota or species once listed as endangered or threatened but now thought to be more common in the state.



**FLOATING MARSH MARIGOLD (*Caltha natans*)**

**Minnesota Rarity Status:** Endangered

**Wetland Indicator Status:** Obligatory Wetland

**Description**

*Caltha natans* is an aquatic with floating reniform to cordate leaves, occasionally with crenulate margins 2-5 cm long, and small (1 cm wide) white or pink flowers with 5 petals. The 20-40 follicles are clustered in a dense head about 4-5 mm in diameter. The more common Marsh Marigold (*C. palustris*) is larger, with a compact rosette, 1.5-4 cm wide yellow flowers, and broad cordate-rotund leaves and tends to grow on wet soils rather than continually submersed in water.

**Habitat**

*C. natans* can be found in slow moving shallow water including small streams, ditches, beaver ponds, and pools in forested wetlands.

**Global Distribution**

*C. natans* has a very scattered circumboreal distribution from one site in northwestern Wisconsin northwest into Canada and thence to Siberia (apparently skipping over Alaska).

**Other Notes**

The slender stems of *C. natans* arise from a submerged rosette but can root and form new plants. It is odd that a plant that produces numerous seeds from May until October and segments of which root so easily would also be very rare in Minnesota. Adding to its peculiar rarity is the fact that suitable habitat appears to be very abundant in northeastern Minnesota yet it was once thought to have been extirpated until it was rediscovered near some of the vanished sites in northern St. Louis County in the 1990's.

**Minnesota Distribution**

St. Louis and Lake counties



**CLUSTERED BUR-REED (*Sparganium glomeratum*)**

**Minnesota Rarity Status:** Special Concern

**Wetland Indicator Status:** Obligatory Wetland

**Description**

*Sparganium glomeratum* is a robust, erect emergent aquatic plant, with fruiting stems (about 1 to 3 (4) dm tall) and leafy shoots growing from thin, light brown rhizomes. The leaves of *S. glomeratum* are erect, rarely floating, and light green. Inflorescence leaves are inflated at the base, sharply keeled and most exceed the flowering portion of the stem. Leaves associated with the flowering clusters tend to be smaller and may or may not exceed the inflorescence.

Inflorescence stems of *S. glomeratum* terminate with a simple inflorescence bearing (1) 3-5 (7) densely crowded, mostly sessile, extra- or supra-axillary, spherical pistillate heads (0.3-1.2 cm). The pistillate heads are positioned below 1 or 2 crowded staminate heads located at the shoot apex on a very short (< 0.5 mm) internode. Perianth segments of the pistillate heads are about 1/3-1/2 the length of the achene. Achenes are fusiform with an obconic base, sometimes slightly constricted just above the middle, about 3-5 mm long, shiny green or brown. These may also have small red colored “glandular” dots near the base (a characteristic not limited to *S. chlorocarpum* as stated by some).

There are 8 species of *Sparganium* in Minnesota but none except some variants of *S. chlorocarpum* are likely to be confused with *S. glomeratum*. These variants of *S. chlorocarpum* have highly congested seed heads like *S. glomeratum*. However, *S. chlorocarpum* has larger achenes to 4-6 mm long with a long straight beak, and 3-9 widely spaced staminate flower clusters on an elongate axis segment above the pistillate flowers. The staminate portion of the inflorescence axis normally remains after pollen is shed. The leaves of *S. chlorocarpum* are strongly keeled and dilated at the base.

**Habitat**

All *Sparganium* species are emergent aquatics. While a few are common in streams, rivers and along lakeshores, *S. glomeratum* is typical of shallow slow moving water. These habitat requirements are often met in shallow ephemeral forest pools, in moats around floating sedge fens or sedge/*Sphagnum* fens, small streams, beaver ponds, ditches through wetlands, and pools and channels in hardwood and conifer swamps. Full sun produces the best growth but *S. glomeratum* is tolerant of some shade. It often grows with these species of emergent plants: *Sparganium minimum*, *Carex lacustris*, *C. lasiocarpa*, *C. rostrata*, *Glyceria grandis*, *Torreyochloa pallida*, *Ranunculus glandulosus*, and *Sium suave*.

**Global Distribution**

Until the mid-1990's *S. glomeratum* was known from only 7 locations in North America. Recent fieldwork has increased the known number of sites significantly. Like *C. natans*, *S. glomeratum* has a very scattered circumboreal distribution from several sites in northwestern Wisconsin northwest into Canada (with one site in eastern Quebec also), then to Siberia (unknown in Alaska) and finally to Scandinavia.

**Minnesota Distribution**

Cook, Lake, Saint Louis, Carlton, Itasca, Aitkin, Cass, and Mahnomen counties.



**BARREN STRAWBERRY**

(*Waldsteinia fragarioides*)

**MINNESOTA RARE PLANT**

**STATUS:** Special Concern

**WETLAND INDICATOR**

**STATUS:** No Rating

**Description**

Superficially, *W. fragarioides* may resemble *Coptis groenlandica*, *Fragaria virginiana*, or *Anemone quinquefolia*. *W. fragarioides* has yellow 5-petaled flowers (*C. groenlandica*, *F. virginiana*, and *A. quinquefolia* are white) and lignified upright stems just barely beneath the soil on which the hairy leaves with fan-shaped segments and cuneate base and the flower stems are produced. The fruit is a cluster of achenes on a dry receptacle hence “Barren Strawberry”.

**Habitat**

*W. fragarioides* grows in moist or dry woods under oaks, jack pine, and mixed northern hardwood/conifer. *W. fragarioides* can under favorable conditions form colonies that cover hundreds or even thousands of square meters.

**Global Distribution**

*W. fragarioides* is widespread over much of the temperate eastern United States and into Quebec. Still very uncommon in Minnesota but the few population that are known cover several hundred or more square meters each.

**Minnesota Distribution**

Pine, St. Louis and Lake Counties

**WEED OF THE WEEK- LEAFY SPURGE (*Euphorbia esula*)**

July 21, 2003

Gary B. Walton

**NAME:** Leafy Spurge (*Euphorbia esula*)

**WETLAND INDICATOR STATUS:** No Ranking



*Euphorbia esula* is native to Eurasia but has become established across much of North America infesting pastures, roadsides, trails, gravel pits, utility right-of-ways, and native prairies. In pastures and prairies it crowds out desirable species. *E. esula* is a poisonous plant and its toxic milky sap can burn eyes and tissues of the mouth and throat.

*E. esula* spreads by seeds and by deep-seated roots that produce sprouts. The deep roots make *E. esula* difficult to eradicate by fire and mowing. Some hope is possible using insects that eat *E. esula*. However, whether these insects will also eat native *Euphorbia* species as well as less aggressive non-native *Euphorbia* grown as ornamentals is uncertain.

## LARGE SEDGES (*Carex*)

July 24, 2003

Gary B. Walton

There are several species of large (around 5- 15 decimeters tall) sedges with coarse leaves and thick stems commonly found in wetlands and moist forested habitats. In this installment *Carex lacustris*, *C. rostrata*, and *C. retrorsa* are discussed.



### **Lake Sedge (*Carex lacustris*, OBL).**

**Inflorescence:** 2-4 pistillate spikes, usually separate, cylindrical. 2-4 distal staminate spikes.

**Perigynium:** Ovoid to ellipsoid-ovoid, glabrous, raised nerves, 6 mm long (range 4-7 mm), narrowed to a slender beak.

**Scales:** Shorter than the perigynium, ovate or oblong, hyaline margins, a green midrib often ending in a prolonged awn.

**Leaves:** 8-15 mm wide, rough margined otherwise glabrous, W-shaped cross section.

**Growth Form:** Stout stems arising singly or in small groups from long thick rhizomes.

**Habitat:** Swamps, marshes, shores.



**Beaked Sedge (*Carex rostrata*, OBL)**

**Inflorescence:** Several pistillate spikes, the perigynia densely crowded in 8 rows sometimes more. Usually 1 staminate spike at top.

**Perigynium:** 4-7 mm long, glabrous, shining, inflated, strongly 8-17 nerved, broadly ellipsoid to subglobose, abruptly contracted to a 1-2 mm smooth beak.

**Scales:** Shorter and narrower than the perigynium, acute to short-awned.

**Leaves:** Flat, yellow-green, septate nodulose, 5-12 mm wide. Base of culm spongy.

**Growth Form:** Colonial by long, thick rhizomes.

**Habitat:** Wet soil, marshes, shallow water.



**Retrorsed Sedge (*Carex retrorsa*, OBL)**

**Inflorescence:** Several crowded sessile pistillate spikes, the lowest on a slender pedicle. 2-4 distal staminate spikes.

**Perigynium:** 4-7 mm long, glabrous, shining, inflated, strongly 8-17 nerved, broadly ellipsoid to subglobose, abruptly contracted to a 1-2 mm smooth beak. Lowermost at least downward pointing.

**Scales:** Shorter and narrower than the perigynia.

**Leaves:** Flat, yellow-green, slightly septate nodulose, 4-10 mm wide.

**Growth Form:** Colonial by long, thick rhizomes.

**Habitat:** Swamps, marshy borders of lakes, streams, low places in woods.

## WHAT'S DEVELOPING MILKWEEDS (*Asclepias*) AND DOGBANES (*Apocynum*)

July 24, 2003

Gary B. Walton

Milkweeds (*Asclepias*) and Dogbanes (*Apocynum*) are genera from two closely related families the Asclepiadaceae and Apocynaceae. The flowers of plants in these families are five-merous, perfect, hypogynous, sympetalous, regular or nearly so. The fruit of most Asclepiadaceae and many Apocynaceae is a linear or ovoid follicle with seeds often bearing a plumose tuft of long soft hairs. The leaves are simple, usually alternate (sometimes opposite or whorled) and the plants may be herbs or twining vines (these in tropical regions). Most species have a milky sap that contains potent toxic glycosides that act on the heart tissue of mammals. The toxic chemicals do not affect larva of the Monarch Butterfly and these compounds are used by the insect to protect it from predators.

Major differences between the two families are in special floral structures found in Asclepiadaceae- notably the connate and thickened style head and the waxy pollen mass and attendant structures not found in the Apocynaceae.

There are several species of *Asclepias* and *Apocynum* native to Minnesota but only a few are commonly



found in the northeastern part of the state. **Common Milkweed (*Asclepias syriaca*, No Rating)** is widespread in fields, clearings, roadsides and similar well-drained habitats. It can be told apart from Showy Milkweed (*A. speciosa*, FAC), which grows in moist prairies and other grasslands, by differences in the “hoods”, prominent structure resembling petals but arising from the top of the anther filament column and subtending the anthers. In *A. syriaca* the hoods 4-5 mm long, the lateral margins with a prominent sharp triangular lobe near the middle. *A. speciosa* hoods are 10-15 mm long and abruptly narrowed below the middle. Flower color of both species varies from green-purple to purple and they are sweetly fragrant. The fruit of *A. speciosa* is densely tomentose. Both species form colonies by root sprouts.



**Left: Monarch Butterfly larva on *Asclepias syriaca*.**



**Swamp Milkweed** (*Asclepias incarnata*, **OBL**) is our only native milkweed with rose-pink flowers. When not in flower it can be distinguished from *A. speciosa* and *A. syriaca* by its non-colonial habit and lanceolate leaves. This species is also used by Monarch Butterfly as a larval host plant. The flowers have a faint chocolate scent.

**Spreading Dogbane** (*Apocynum androsaemifolium*, **No Rating**) is a common plant of upland woods, and sometimes in fields and along roadsides. *A. androsaemifolium* is a somewhat drooping plant with several branches arising from the main stem. It can form dense colonies by root sprouts. The related **Hemp-Dogbane** (*A. cannabinum*), so named because the stem fibers can be made into durable twine is rated as FAC and usually grows in moist soils along roadsides and the margins of wetlands in full-sun. It also spreads by root sprouts. *A. cannabinum* is an erect plant with branches near the top only. The leaves look like miniatures of *Asclepias* but with very visible white veins. The flowers of both dogbanes are sweetly fragrant.

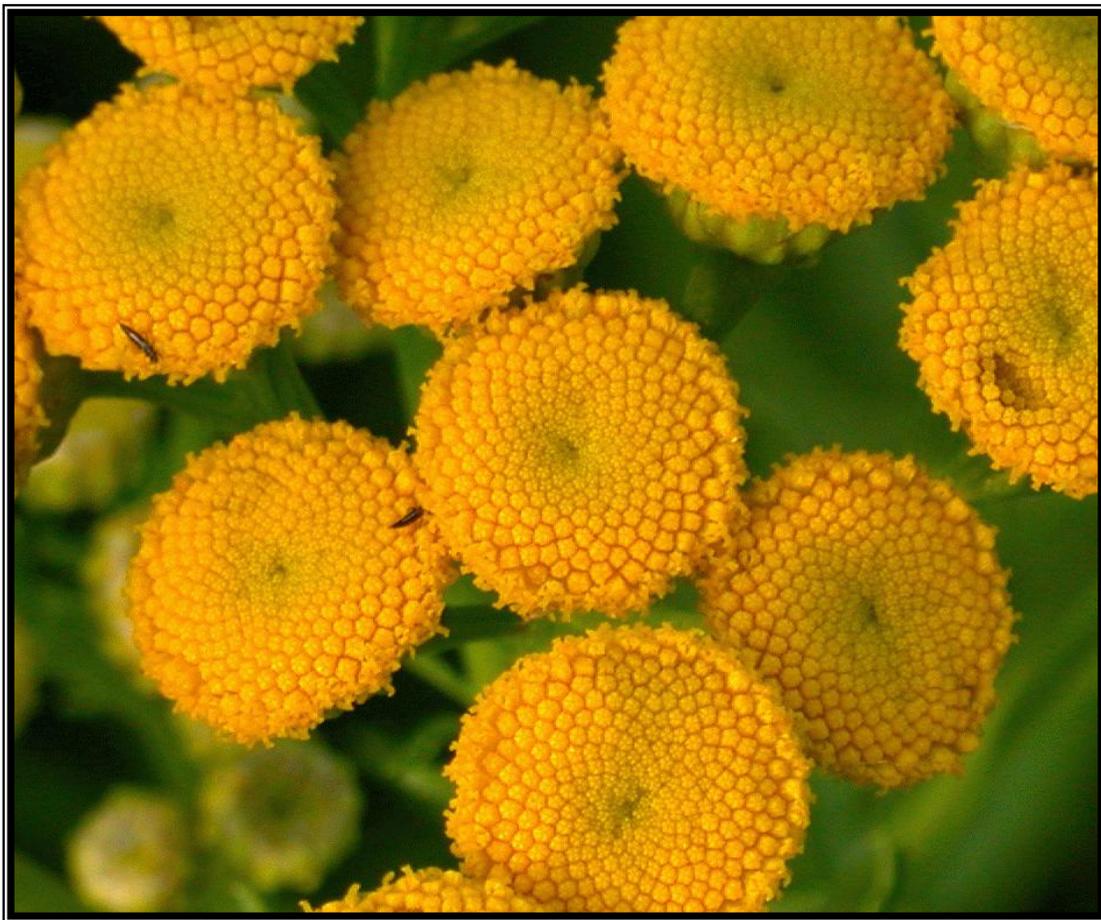


**WEEDS OF THE WEEK-**  
**SPOTTED KNAPWEED (*Centaurea bieberstenii*) and TANSY (*Tanacetum vulgare*)**

July 25, 2003

Gary B. Walton

These two species, both members of the Aster Family (Asteraceae), are introductions from Eurasia and in the case of Tansy (*Tanacetum vulgare*) probably deliberate. Tansy has been used as a flavoring; an insect repellent and its toxic oils have been used in some herbal medicines. Spotted Knapweed (*Centaurea bieberstenii*), while somewhat ornamental, is more likely an accidental introduction. Both Tansy and Spotted Knapweed are aggressive invaders of disturbed sites. They can quickly spread from disturbed edges of native vegetation communities such as grasslands and prairies where they can displace native species. Tansy grows best on moist soils in full sun but will survive on sandy soils and even in rock crevices. Spotted Knapweed is able to thrive on poor sandy soils and on soils of moderate fertility in full sun. Both are often seen along roadsides, utility right-of-ways, gravel pits, and waste ground in urban areas.



**Tansy (*Tanacetum vulgare*, No Rating)** can be recognized by its somewhat coarsely divided pinnatifid leaves that are strongly aromatic. The yellow flower heads are discoid (outer flowers without petals like the inner flowers) and borne in clusters at the top of the plant stem. *T. vulgare* is a perennial that can easily spread by rhizomes. The dry stems of the previous season are stiff and can survive the winter into spring where they present a serious fire danger in years of low rainfall.

The flower heads of *T. vulgare* were once used as flavoring in some types of pudding.



**Spotted Knapweed or Star Thistle** (*Centaurea biebersteinii*, **No Rating**) is a very showy roadside weed in with pink-purple flowers (rarely white) bloom from late July to September. These flowers attract many kinds of pollinating insects thus helping to increase the species range in North America.

The leaves of *C. biebersteinii* are coarse, deeply pinnatifid to bipinnatifid except those associated with the inflorescence. From a distance the plant has a gray-green cast.

*C. biebersteinii* gets its name "spotted" from the black-brown spot at the apex of the phyllaries (bracts that enclose the flower head). The phyllary tips are also fringed with flattened projections

Two species of *Centaurea* are commonly cultivated in gardens. Mountain Bluet (*C. montana*) a native of Central Europe has large flower heads with rich blue flowers. It occasionally escapes cultivation. The other species, an annual, is Bachelor's Button (*C. cyanus*), which is normally pale blue, but several variations are cultivated.



## GRASS TERMINOLOGY

Gary B. Walton

August 11, 2003

Glume - One of two bracts in a pair at the base of a grass spikelet.

Lemma - The next bract above the glumes. Usually subtending a flower with the palea.

Palea - The bract that immediately subtends a grass flower.

Spike - An elongate, unbranched, indeterminate inflorescence with sessile flowers.

Spikelet- A small spike consisting of small reduced flowers inserted alternately along the rachilla.

Floret - An individual flower of a definite cluster.

Lodicule - A small scale possibly representing a vestigial perianth in grasses.

Rachilla - The axis of the spikelet in a grass.

Awn - A hair or bristle terminating certain plant organs such as one of the leafy bracts of a grass plant.

Caryopsis - The single-seeded dry indehiscent fruit of the grass. Formed by the fusion of the seed and the pericarp (fruit wall).

Culm - A stem of a monocot. Usually refers to the flowering stem.

Blade - The flattened portion of the grass leaf.

Sheath - The elongate tubular portion of the grass leaf that surrounds the culm or other leaves not yet fully developed.

Ligule - The membranous projection at the junction of the sheath and blade in grasses.

Rhizome - A subterranean horizontal stem.

Stolon - An aboveground horizontal stem that roots at the nodes and frequently at the tip.

### **References:**

Edward G. Voss. 1972. Michigan Flora Part 1, Gymnosperms and Monocots. Cranbrook Institute of Science and the University of Michigan Herbarium.

James Payne Smith, Jr. 1977. Vascular Plant Families. Mad River Press. Eureka, CA.

Key to illustration (from Smith 1977) on next page:

A - *Festuca* spikelet diagram.

B - *Avena* spikelet diagram.

C - Grass flower, arrow indicates lodicules.

D - Generalized spikelet showing rachilla, glumes, lemmas, palea, flowers, and awns.

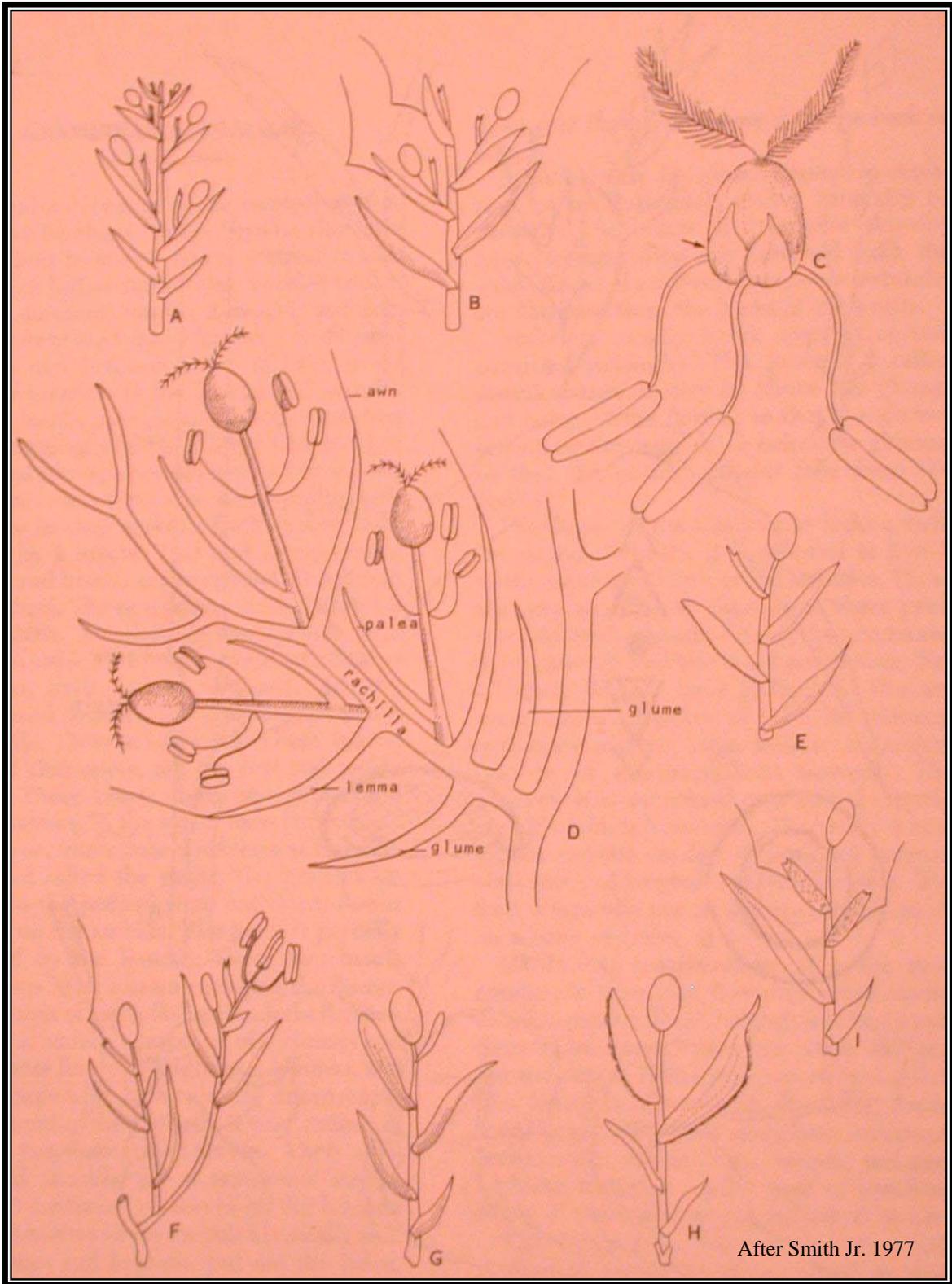
E - *Agrostis* spikelet diagram.

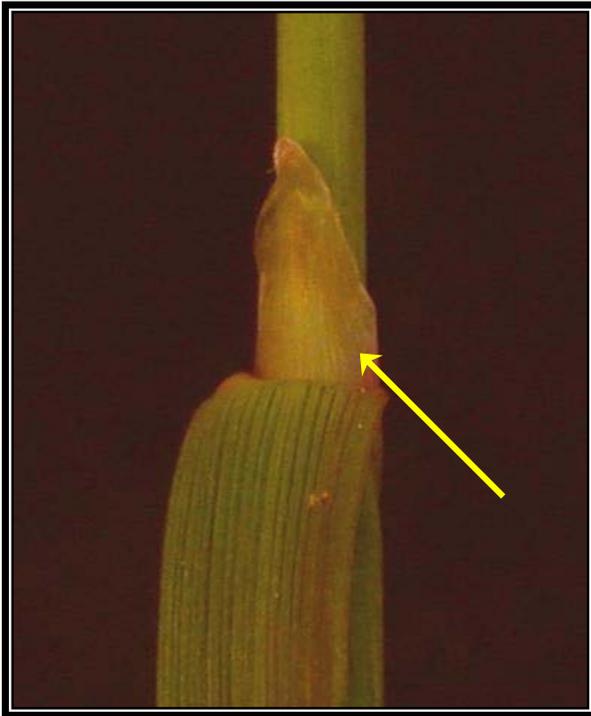
F - *Andropogon* spikelet diagram.

G - *Panicum* spikelet diagram.

H - *Oryza* spikelet diagram.

I - *Anthoxanthum* spikelet diagram.





Left: Ligule on *Alopecurus pratensis*.  
Right: Glumes, lemmas, and awns (from lemmas) of  
flowering *Avena fatua* spikelet.  
Below: Spikelets of *Bromus inermis* showing emerging  
anthers.



## RARE PLANTS OF NORTHEASTERN MINNESOTA- PART 2

August 11, 2003

Gary B. Walton

In keeping with the grass theme this week, two rare species of grasses are discussed here.



**WAVY or CRINKLED  
HAIRGRASS (*Deschampsia  
flexuosa*)**

**Minnesota Rarity Status:  
Special Concern**

**Wetland Indicator Status: no  
rating)**

### **Description**

Wavy Hairgrass is a perennial grass that forms dense tufts of fine leaves

The panicle of is tawny to bronze-purple, drooping on a stem up to 1meter tall with purple nodes and convolute leaves. When in full flower the effect is quite dramatic.

The 2-flowered spikelets of *D. flexuosa* hang loosely in small groups from the ends of wiry and sometimes twisted pedicles. Spikes with two flowers. The first glume is 3 to 4.5 mm long, the second 3.6 to 5 mm long and acuminate. Lemmas scabrous, truncate and minutely toothed. There is a noticeably twisted awn from the base of the lemma and extending beyond it.

### **Habitat**

On sandy soils and on rock out crops often in full sun.

### **Global Distribution**

A circumboreal species.

### **Minnesota Distribution**

Cook, Lake, and St. Louis counties.



**Pale Manna Grass (*Torreyochloa pallida*,)**

**Minnesota Rarity Status: Special Concern**

**Wetland Indicator Status: OBL**

**Description**

Pale Manna Grass is a lax plant with weak culms lying on or just beneath the water's surface. Only the last few internodes of the culms are upright ending in a pale green, diffuse inflorescence. Culms of Pale Manna Grass radiate from a central point rooted in the silt and form a loose tuft.

In shallow water the leaves float on the surface and the nodes often root in the water or in the mud if the plant is stranded. Spikelets 4 to 6 flowered. The glumes broadly rounded at the scarious tips, the first 0.9 to 2.1 mm, the second 1.1 to 2.4 mm. The ovate finely hairy lemmas (2 to 3.5 mm) are prominently 5- to 7-nerved with thin erose tips, membranous, and irregular.

Synonyms for *T. pallida* include *Glyceria pallida* (Torr.) Trin., *G. fernaldii* (Hitc.) St. John, *G. neogaea* Steud., *Puccinellia pallida* (Torr.) Claus., *P. fernaldii* (Hitc.) Voss, and *Windsoria pallida* Torr. Obviously, there is some confusion regarding its proper taxonomic position.

**Habitat**

Pale Manna Grass is a denizen of swamps and shallow water.

**Global Distribution**

It ranges across much of eastern North America from Newfoundland to Minnesota, south to North Carolina and Missouri.

**Minnesota Distribution**

Cass, Itasca, Koochiching, Aitkin, Cook, Lake, and St. Louis counties.

## WHAT'S DEVELOPING- GRASSES (POACEAE) PART 1

Gary B. Walton

August 11, 2003

Grasses are a prominent component of wetland vegetation yet many people tend to avoid learning the species. With some 600 genera and 10,000 species worldwide they are a difficult group and identification relies upon knowing the arrangement and other characters of the flowers, not an easy task given that the flowers of grasses are small and not very colorful or showy. For a list of terms and definitions of the parts of a grass plant, see the web page [Grass Terminology August 11, 2003](#).

### **FESTUCEAE: Bromes (*Bromus*)**

There are three species of Bromes (*Bromus*) commonly found in our area. Two are native and one is an introduced European forage species. Successful separation of the native from the non-native species relies upon knowing whether the lemmas are glabrous to merely scabrous or hairy at least on the margins. Of course to get this far one must be able to tell the lemmas from the glumes and it cannot be emphasized too often how important it is to thoroughly learn the parts of the grass plant.



**Smooth or Hungarian Brome (*Bromus inermis*, no rating)** is a widespread grass often planted for hay crops, forage, and soil erosion control. It has become so common that it appears to be native. *B. inermis* is a rhizomatous grass forming thick sods on good soils that choke out other species. The lemmas of *B. inermis* are glabrous as are the stems, blades, sheaths, and scales. Rarely there may be a fine pubescence at the stem nodes or the lemmas may be scabrous along the margin. An awn may or may not be present on the lemmas. Lemmas 10 to 12 mm long, 3- or 5-veined. First glume 4 to 8 mm, 1-veined, second glume 7 to 11 mm with 3 veins. The spikelets are 15-30 mm long with 7 to 11 flowers. The panicle, which has 4 to 10 branches per node, is open at anthesis but later contracts after pollination. Leaves of *B. inermis* are 8 to 15 mm wide on culms to 10 dm.



**Kalm's Brome (*Bromus kalmii*, FAC)** a loose clump forming perennial to 10 dm found in dry openings and dry woods.

Leaves 3 to 6 per stem, 10-20 cm by 5 to 10 mm, sheaths villous, nodes hairy. Spikelets on drooping pedicles, the first glume 6 to 7 mm, 3-veined, the second 7 to 9 mm, 5-veined. Lemmas 8 to 10 mm, the awn 2 to 3 mm. Spikelets softly villous.



**Fringed Brome (*Bromus ciliatus*, FACW)** has culms single or in small clusters, their height to 12 dm. Frequent in moist woods and meadows.

Blades 4 to 10 mm wide sometimes sparsely hairy, nodes glabrous or hairy. Spikelets with 4 to 10 flowers and drooping. The first glume lance-subulate 5 to 8 mm, 1-veined, the second 7 to 10 mm, 3-veined and often short awned. Lemmas 10 to 13 mm, long hairy on the margins, the awn 3 to 5 mm. Some variants of Fringed Brome are glabrous.

## WHAT'S DEVELOPING- ORCHIDS

August 11, 2003

Gary B. Walton

There are 43 species of orchids native to Minnesota and while most are well distributed across the state, they are seldom common in most locations. Some species such as Pink Moccasin Flower (*Cypripedium acuale*, FACW) are found throughout Minnesota and can be frequent to abundant on some sites. Others like the Ram's Head Lady Slipper (*C. arientinum*, FACW+) are rare statewide and local populations are very small.

Many orchids have large showy colorful flowers but there are some species with little color and small flowers. Some, such as Northern Green Orchid (*Platanthera hyperborea*, FACW+), are commonly found in wetlands. Below are three species of inconspicuous orchids commonly found in wetlands.



**Fen Orchid (*Liparis loeselli*, FACW)** is a yellow-green orchid that prefers neutral to slightly alkaline or calcareous soils. Flowering time is midsummer.

### **Description of flowers and leaves**

Lowest petal ("lip") 5 mm long, ascending at the narrowed base, ovate with upturned margins. Flowers borne on a loose raceme with 2 to 12 flowers. Leaves are basally situated from a pseudobulb, lanceolate to elliptic, 5 to 15 cm long by 2-3 cm wide.



**Northern Green Orchid (*Platanthera hyperborea*, FACW+)** occurs in a variety of wetland types such as forested fens, cedar swamps, black ash swamps, and meadows. Many *Platanthera* orchids have showy flowers but Northern Green Orchid flowers are drab and green to greenish-white. The lowest petal of all *Platanthera* orchids is prolonged backwards into a spur. The tip shape and length of the spur are critical diagnostic characters. Flowering time is midsummer.

**Description of flowers and leaves**

Lip lance-ovate, 4-7 mm long, gradually widened towards the base. Spur blunt and about equal in length to lip. Leaves numerous, lanceolate to oblanceolate, 25 cm long by 3 cm wide, becoming smaller, bract-like towards top of flowering spike.



**Early Coralroot Orchid** (*Corallorhiza trifida*, FACW-) is yellow colored throughout and possesses no chlorophyll. It obtains nutrients by an association with mycorrhizal fungi attached to the roots of other plants. Early Coralroot Orchid can be found in black spruce swamps and in upland coniferous forests. It is also occasionally found in willow swamps. Flowering time is early summer.

**Description of flowers and leaves**

Lip with lateral lobes and not ending in a spur. Petals and sepals usually yellowish-green, sometimes light purplish, and the lip sometimes with a few purple spots. Leaves are reduced to a few sheathing scales. The whole plant is yellowish-green.

## WHAT'S DEVELOPING- GRASSES PART 2

August 12, 2003

Gary B. Walton

### **PANICEAE: Barnyard Grasses (*Echinochloa*) and Foxtail Millets (*Setaria*)**

*Echinochloa* and *Setaria* are two genera of millet-like grasses, often weedy, that colonize cultivated and disturbed wet ground. There are many species in these genera (140 in *Setaria* and 40 in *Echinochloa*) but most are native to warmer regions of the world. Some are cultivated for fodder and a few are widely distributed as weeds in temperate regions. Four species common to Minnesota are described here.



**Barnyard Grass (*Echinochloa crusgalli*, FACW)** is a common weed of cultivated wet ground and disturbed wet soil including shores. This grass with several stems from the base can grow to a height of 2 meters but is usually about half that size. The second glume and the sterile lemma are hairy or scabrous to subglabrous but the hairs are not papillose-based as in other similar *Echinochloa* species. There is no awn on the glumes. The inflorescence spike is several branched and the branches and main axis clad with papillose-based setae. Often the papillose-based setae are longer than the spikelets. Leaf sheaths are glabrous, the blades 5 to 30 mm wide.

Native of Eurasia and widespread in North America. The variety *E. c.* var. *frumentacea* is sometimes cultivated as a forage crop.



**Left: Yellow Foxtail or Yellow Bristle Grass (*Setaria glauca*, FAC)**

**Middle: Green Foxtail Grass (*Setaria viridis*, no rating)**

**Right: Foxtail Bristle Grass or Foxtail Millet (*Setaria italica*, FACU)**

*Setaria* is another genus of grasses widely distributed in the tropics and other warm regions with some members now established as weeds in the temperate zone. The three species shown here are common throughout Minnesota. The inflorescence is crowded dense spike-like panicle of many nodes and many short branches. The branch system is composed of fertile branches interspersed with many sterile branches reduced to bristles.

**Yellow Bristle Grass (*Setaria glauca*, FAC)** an annual to 10.3 cm in large tufts with more or less erect stems. There are 4 to 12 sterile bristles below each fertile spikelet. The first glume is 3-veined, the second 5-veined. The fertile lemma is transversely strongly rugulose. The inflorescence axis is hispid.

**Green Foxtail Grass (*Setaria viridis*, no rating)** an annual to 20.5 cm. There are 1 to 3 sterile bristles below each fertile spikelet. The first glume is 3-veined, the second 5-to 6-veined. The fertile lemma is pale green and transversely finely rugulose. The inflorescence axis is hispid and densely villous, the branches not verticillate.

**Foxtail Bristle Grass (*Setaria italica*, FACU)** an annual resembling a larger form of Green Foxtail Grass. There are 1 to 3 sterile bristles below each fertile spikelet. The first glume is 3-veined, the second 5-veined. The fertile lemma is smooth and shiny. The inflorescence axis is hispid, the branches lobulate. Sometimes cultivated for grain.

## WHAT'S DEVELOPING- GRASSES (POACEAE) PART 3

Gary B. Walton

August 18, 2003

### TRITICEAE: Wheat-grasses (*Agropyron* and *Elymus*)



**Quackgrass** (*Agropyron repens*) is a weedy introduced species found across much of North America occurring in fields, ditches, and along roads. **Slender Wheat-grass** (*Elymus trachycaulus*), which is similar, is a native species with many variants and occurs more often in natural situations.

**Quackgrass (*Agropyron repens*; syn. *Elytrigia repens*)**

**Wetland rating:** FACU

**Habit:** Rhizomatous perennial to 1 meter. Leaves flat, 3 to 10 mm wide, with some scattered hairs.

**Panicle:** Compact, erect.

**Spikelets:** Solitary, 10 to 18 mm, disarticulating below the glumes.

**Glumes:** Half as long as spikelet, 5 to 7 veined, acute with a 0.4 to 4 mm long awn.

**Lemma:** 7 to 10 mm ending usually in a point or short straight 5 mm awn.

**Habitat:** A weed of cultivated fields. Sometimes used for hay. Naturalized in a variety of moderately moist habitats. Native of Eurasia.

**Slender Wheat-grass (*Elymus trachycaulus*; syn. *Agropyron trachycaulum*)**

**Wetland rating:** FAC

**Habit:** Tufted perennial from 0.3 to 1.5 meters. Leaves flat, scabrous at least on upperside.

**Panicle:** Panicle compact, erect.

**Spikelets:** Most solitary at nodes of rachis, overlapping, 3- to 5-flowered, disintegrating at maturity.

**Glumes:** Lanceolate, acuminate to short-awned, 5 to 7 veined. First glume 6 to 10 mm, second glume 7 to 12 mm.

**Lemma:** 7 to 10 mm, glabrous to scabrous distally, sometimes short hairy. Usually awnless.

**Habitat:** Often in dry habitats such as rock outcrops but also in moist sandy swales.

## WHAT'S DEVELOPING- GRASSES (POACEAE) PART 4

Gary B. Walton

August 18, 2003

### PHALARIDEAE: Canary Grass (*Phalaris*)



#### Canary Grass (*Phalaris arundinacea*)

**Wetland rating:** FACW+

**Habit:** A rhizomatous perennial grass with broad leaves (10 to 15 mm wide and 1 to 20 cm long) on thick culms from 0.75 to 1.5 meters.

**Panicle:** Thick, with purple tinge while in flower, branched or lobed.

**Spikelets:** One fertile flower and two sterile flowers. Articulated above the glumes.

**Florets:** Awnless, laterally compressed with two sterile lemmas and one fertile.

**Glumes:** Subequal, about 4 to 6.5 mm, usually glabrous.

**Lemma:** Sterile lemmas linear-subulate, villous. Fertile lemma terminal, 3 to 4.5 mm long, hairy at tip.

**Habitat:** Marshes, stream banks, lakeshores, moist fields, ditches. Cultivated for hay. Native strain may be overwhelmed by introduced European strain.

**AGROSTIDEAE: Bent Grass (*Agrostis*), and Timothy (*Phleum*)**



**Redtop Grass (*Agrostis gigantea*; syn. *A. stolonifera* var. *major*; *A. alba* an incorrectly applied name)**

**Wetland rating:** FAC?

**Habit:** Rhizomatous, forms a sod.

**Panicle:** Suffused with purple or red with spreading unequal branches. Often with florets at branch bases.

**Spikelets:** One flowered, crowded on branches. Articulated above the glumes.

**Glumes:** About equal, narrow, 1-veined, keeled.

**Lemma:** Two-thirds as long as glumes.

**Palea:** Half to two-thirds as long as lemma.

**Habitat:** Cultivated for hay but widely naturalized in fields, woods, wet meadows and similar places. Native of Eurasia.

**Tickle Grass** (*Agrostis hyemalis* and *A. hyemalis* var. *scabra*; syn. *A. scabra*, *A. hyemalis* var. *scabra*, *A. hyemalis* var. *tenuis*)

**Wetland rating:** FAC

**Habit:** Tufted perennial with slender culms from 10 to 90 cm. Leaves largely basal, flat or involute and narrow (3 mm wide or less).

**Panicle:** Reddish, ovoid in shape with diffuse branches. Sometimes half the plant's total height. Branches scabrous, filiform and divaricate forking well above the middle.

**Spikelets:** 1-flowered. Articulated above the glumes.

**Glumes:** Scabrous on midvein.

**Lemma:** Usually awnless, sometimes with a small straight awn.

**Palea:** Obscure or less than half as long as lemma (no more than 0.3 mm).

**Habitat:** Various wet or dry habitats, often with some disturbance. Native, circumboreal distribution.

**Note:** Plants resembling *Agrostis hyemalis* but with the panicle less reddish and the branches forking below the middle may be *A. geminata*, a very rare grass species.





**Timothy Grass (*Phleum pratense*)**

**Wetland rating:** FACU

**Habit:** Tufted perennial, culms to 1 meter, their bases bulbous thickened. Leaves rough margined, 5-8 mm wide.

**Panicle:** Cylindrical.

**Spikelets:** Articulated above the glumes.

**Glumes:** Rounded with distinct awn to 3 mm. Pectinate ciliate on keel base. Pale green.

**Lemma:** Awnless.

**Palea:** Narrow, almost as long as lemma.

**Habitat:** Cultivated for hay. Naturalized in fields and other open places. Native of Eurasia.

**WHAT'S DEVELOPING- PEARLY EVERLASTING (*Anaphalis margaritacea*)**

August 19, 2003

Gary B. Walton



**Pearly Everlasting (*Anaphalis margaritacea*)**

**Wetland Rating:** No rating.

**Description:** Pearly Everlasting is a member of the Aster Family (Asteraceae) and a close relative of the Cudweeds (*Gnaphalium*) and Pussytoes (*Antennaria*). The flower heads of Pearly Everlasting are composed of numerous dry scarios involucular bracts and small tubular flowers. Leaves are alternate, densely white woolly below, and often sparsely white woolly above, sometimes glandular, with revolute margins. The stems are also densely white woolly. This native rhizomatous perennial is a common plant of dry woods and clearings flowering in late summer.

## WHAT'S DEVELOPING- GRASSES PART 5

August 20, 2003

Gary B. Walton

### **CHLORIDEAE (MELICEAE of some authors): Manna Grasses (*Glyceria*)**

*Glyceria* is distinguished by acutish to obtuse awnless lemmas with prominent nerves, glume with a single distinct nerve, and sheaths closed much of their length. Similar to *Puccinellia* (including *Torreyochloa*) but *Glyceria* is rhizomatous whereas *Puccinellia* is without rhizomes (although decumbent). In addition, *Puccinellia* leaf sheaths are completely open and the second glume has 3 to 5 distinct nerves at the base.

There are five species of *Glyceria* in northern Minnesota but these three, *Glyceria striata*, *G. canadensis*, and *G. grandis*, are most frequently encountered.



#### **Fowl Manna Grass (*Glyceria striata*)**

**Wetland Rating:** OBL

**Habit:** Slender culms to 1.2 meters, leaves 2 to 6 mm wide.

**Panicle:** Lax and diffuse, drooping towards tip. Spikelets mostly beyond middle of branches.

**Spikelets:** Ovate, greenish to purplish.

**Glumes:** Ovate, thin, the first 0.5 to 1mm, the second 0.8 to 1.3 mm.

**Lemna:** Elliptic to ovate, veins conspicuously raised, obtuse and scarious at the tip.

**Habitat:** Forming patches and dense stands in swamps and marshes in shallow water and wet soil.

Two similar species (*G. borealis* and *G. septentrionalis*, both OBL) have linear-cylindric spikelets on slender panicles. *G. borealis* and *G. septentrionalis* are typically found in shallow water along lakeshores and rivers.



**Rattlesnake Manna Grass (*Glyceria canadensis*)**

**Wetland Rating:** OBL

**Habit:** Culms solitary or in small tufts, erect to 1 meter. Leaves 2 to 5 mm wide.

**Panicle:** Lax and diffuse with strongly drooping branches. Spikelets mostly toward branch tips.

**Spikelets:** Broadly ovate.

**Glumes:** Scarious margined. First glume lanceolate, 1.6 to 2.4 mm, the second broadly ovate, 4 to 8 mm.

**Lemna:** Broadly ovate with obvious but not raised veins.

**Habitat:** Swamps, bogs, wet woods. Often in scattered patches.



**Reed or Giant Manna Grass (*Glyceria grandis*)**

**Wetland Rating:** OBL

**Habit:** Culms clustered, thick, erect.

**Panicle:** Diffuse with many branches, nodding at tips.

**Spikelets:** Somewhat flattened, 4 to 6.5 mm.

**Glumes:** Membranous or scarious, pale, acute. First glume 1.2 to 1.9 mm, second 1.5 to 2.4 mm.

**Lemma:** Purplish, narrowly ovate, prominent raised veins.

**Habitat:** Swamps, shallow pools, ditches. Can form dense stands.

## MISCELLANEOUS ASTERACEAE

August 26, 2003

Gary B. Walton

The following species of the Aster Family (Asteraceae) can be dominant plants in old fields and other open sites especially if some disturbance has occurred. Some are native while others are introduced species. They tend to be aggressive colonizers.



**Yarrow (*Achillea millefolium*)**

**Wetland Rating:** FACU

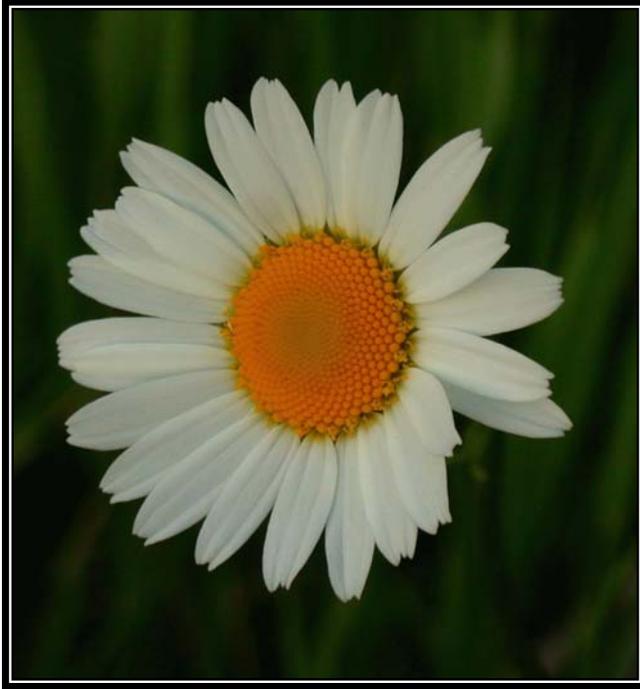
**Description:** Numerous small white flower heads are borne in a corymbiform inflorescence. The leaves and stems are densely wooly. Leaves are divided multiple times giving them a very lacey appearance. The whole plant is strongly aromatic. A perennial species found across the northern hemisphere with both native and non-native strains in North America.



**Black-eyed Susan (*Rudbeckia hirta*)**

**Wetland Rating:** FACU

**Description:** A native biennial to short-lived perennial with coarse hairs over the leaves and stems. Best known for the dark brown central disk flowers (the “black eye”) surrounded by bright yellow ray flowers. Common over much of eastern North America.



**Ox-Eye Daisy** (*Chrysanthemum leucanthemum*)

**Wetland Rating:** No rating.

**Description:** Ray flowers white, disk flowers yellow, heads on mostly leafless stems to 0.5 meters. Leaves glabrous or very sparsely hairy, oblanceolate, entire to deeply blunt-toothed. A non-native perennial from Eurasia found across much of North America.



**Orange Hawkweed** (*Hieracium aurantiacum*)

**Wetland Rating:** No rating

**Description:** Very similar to Yellow Hawkweed (*H. caespitosum*, described below) but its bright orange flowers are unique among all *Hieracium* species in North America whether native or introduced. Orange Hawkweed is a non-native perennial from Eurasia found across much of North America.



**Yellow Hawkweed (*Hieracium caespitosum*)**

**Wetland Rating:** No rating

**Description:** Yellow flowers and long setose hairs on the stems and leaves (with some stellate hairs) becoming densely stellate-tomentose and black-glandular on the inflorescence pedicels and on the involucre bracts set this species apart from the less common sparsely long setose glaucous leaved and sparsely stellate haired *H. piloselloides*. Both are Eurasian species now widespread in North America.

## WEEDS OF THE WEEK: BULL THISTLE AND FIELD THISTLE

August 27, 2003

Gary B. Walton



### **Bull Thistle (*Cirsium vulgare*)**

**Wetland Rating:** FACU-

**Description:** *C. vulgare* is a non-native, taprooted biennial to 1.5 meters. The pinnatifid leaves with spiny segments sharply triangular are decurrent on a spiny winged stem. In addition, the spiny the leaves and stem are sparsely white tomentose. First year plants form a rosette of extremely spiny pinnatifid leaves. The plant flowers the following year.

**Flower Head:** One to several per stem, the bracts all spine-tipped and without a sticky ridge. Color purple, rarely white.

**Habitat:** Old fields, pastures, roadsides, disturbed sites.

**Similar species:** Prairie Thistle (*C. flodmanii*) and Wavy-Leaved Thistle (*C. undulatum*) both native but uncommon in northern MN.



### **Field Thistle (*Cirsium arvense*)**

**Wetland Rating:** FACU

**Description:** *C. arvense* is a non-native perennial to 1.5 meters that colonizes sites by sprouts from creeping roots. The pinnatifid leaves with lobed to triangular spiny segments are white tomentose beneath.

**Flower Head:** Several per stem in a flat-topped cluster, the bracts weakly spine-tipped and without a sticky ridge. Color purple, rarely white. Flower heads in the cluster are either pistillate or staminate, but some are perfect.

**Habitat:** Old fields, pastures, roadsides, disturbed sites.

**Similar species:** Swamp Thistle (*Cirsium muticum*) and Pasture Thistle (*C. discolor*) both native species.

## WHAT'S DEVELOPING- ASTERS PART 1

August 28, 2003

Gary B. Walton

There are over 175 species of *Aster* distributed in the northern hemisphere but most occur in North America. Minnesota is home to about 25 species and of these about 18 species occur in the northeastern part of the state. Identifying Asters is not easy (many hybrids are known to exist, too) and requires knowing whether the specimen in question was:

- 1) rhizomatous or not and if rhizomatous whether it was long rhizomatous or not, and if not rhizomatous was it a fibrous rooted perennial or an annual,
- 2) if it had basal leaves or not, and if there were basal leaves were they cordate or not, and if cordate were they also petiolate or not,
- 3) if the cauline (stem) leaves were similar to the basal or were they cordate clasping, sessile or petioled,
- 3) if the inflorescence was paniculiform or corymbiform,
- 4) were the involucular bracts ciliate, what shape did they have (linear, diamond and so on), were they of one color or two, and were they glabrous, pubescent, or glabrous, and are they of two sizes,
- 5) were the ray flowers white, blue, pink, how many are there, how long are they and what percentage of the ray flower is included in the limb,
- 6) were the achenes glandular, hairy, or glabrous,
- 7) and was the pappus (a modified calyx crowning the achene) in two rows with one shorter than the other or just one row.

Since many of these characters are not obvious without a good dissecting microscope, some species are impossible to identify in the field (unless of course you carry a microscope with you and copies of the latest monographs on *Aster*). Among the more difficult species to identify, and which will only be mentioned here in this series, are *Aster borealis*, *A. X longulis*, *A. ontarionis*, *A. hesperius*, *A. cordifolius*, *A. sagittifolius*, *A. oolentangiensis*, and *A. brachyactis*. *Aster* species that will be covered are: *A. ciliolatus*, *A. macrophyllus*, *A. puniceus*, *A. modestus*, *A. lanceolatus*, and *A. umbellatus*. *A. ericoides*, *A. laetiflorus*, *A. firmus*, and *A. novae-angliae* will not be discussed in much detail.

Plant trivia note: According to some astrologists, Asters are considered the flower for persons born under the sign of Virgo. Also, the name "Aster" is from the Latin word for "star".

**Northern Heart-Leaved or Fringed Aster** (*Aster ciliolatus*)

**Wetland Rating:** no rating

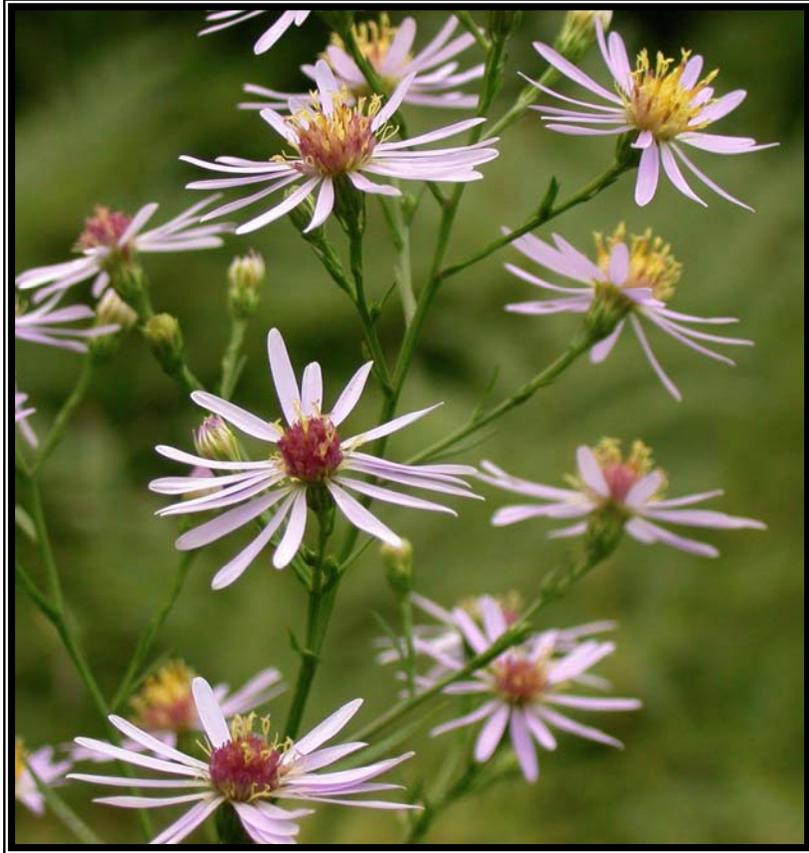
**Description:** This native rhizomatous perennial is distinguished by its cordate based leaves and upper leaves with broadly winged petioles with a marginal fringe of hairs. The leaf margins are coarsely serrate and their lower surfaces hirsute.

**Flower heads:** Numerous (around 50 but sometimes more) blue-rayed flower heads are borne in a terminal panicle of hirsute to hirsute puberulent branches. The ray flowers (8 to 15 mm) number around 12 to 25 per flower head. The involucre is somewhat imbricate, acuminate to acute, glabrous but sometimes with ciliate margins and end in a narrow green tip.

**Habitat:** Woods, openings, roadsides, clearings, usually dry or well-drained soils.

**Similar species:** *A. cordifolius*, *A. sagittifolius*, *A. oolentangiensis*.

**Photos showing flower heads of Northern Heart-Leaved Aster (upper right) and ciliate winged petiole and portion of leaf lamina with toothed margins (lower right).**



**WHAT'S DEVELOPING- HORSEWEEDS (*Conyza*) AND FLEABANES (*Erigeron*)**

August 28, 2003

Gary B. Walton



**Horseweed (*Conyza canadensis*)**

**Wetland Rating:** FAC-

**Description:** A native annual often appearing in great abundance after a fire or other disturbance in forests. The plant grows from 10 cm to 1 meter in height and is covered in numerous small flower heads with white ray flowers. Leaves are linear, simple, alternate and coarse ciliate at least near the base.



**Rough Fleabane (*Erigeron strigosus*)**

**Wetland Rating:** FAC-

**Description:** A native annual or biennial to 70 cm frequently appearing with the similar Annual Fleabane (*E. annuus*, FAC-) on disturbed or sparsely vegetated sites. Rough Fleabane is sparsely leafy, with short hairs usually appressed to the stem and the involucre hairy and vaguely glandular. Ray flowers are usually white, rarely pink or blue, and about 6 mm long. Basal leaves are oblanceolate to elliptic, 15 cm long. Annual Fleabane differs by its ample cauline leaves, finely glandular involucre, and 2-nerved achenes.

## WHAT'S DEVELOPING-GOLDENRODS (*Solidago* and *Euthamia*) PART 1

August 28, 2003

Gary B. Walton

Goldenrods (*Solidago* and *Euthamia*) are comprised of some 108 species most of which are native only to North America. Seventeen species occur in Minnesota with at least 10 in the northeastern part of the state. Goldenrods are distinguished from other Asteraceae by their bright yellow flowers (except *Solidago ptarmicoides* and *S. bicolor* which are white) and a combination of these characters:

- 1) Pappus of a single series of short bristles,
- 2) Leaves alternate
- 3) Involucelar bracts imbricate in several series,
- 4) Anthers not tailed, style of the asterous type (flattened with marginal rows of papillae and a terminal hairy segment)
- 5) Plants fibrous rooted without a taproot
- 6) Leaves not glandular punctate except in *Euthamia* and *Solidago odora*.

Six species of Goldenrod will be discussed in this series: *Solidago nemoralis*, *S. juncea*, *S. hispida*, *S. flexicaulis*, *S. gigantea*, *S. canadensis*, *S. uliginosa*, and *Euthamia graminifolia*. *Solidago ptarmicoides*, a white flowered species, and *S. rigida*, a yellow flowered species with a flat-topped inflorescence, will not be covered, as neither is very common. They occur sporadically in our area in rock crevices along Lake Superior and sometimes inland on rock outcrops. *S. rigida* also occurs on the Mesaba Range in old mine pits and on spoil dumps.

When attempting to identify a Goldenrod specimen to species it is important to ask questions similar to those presented in Asters Part 1.



**Early Goldenrod (*Solidago juncea*)**

**Wetland Rating:** No Rating

**Description:** Plant up to 1.5 meters but usually less. Usually glabrous throughout but sometimes with short hairs on the leaves or inflorescence. Nearly all leaves are basal, scarcely or not all three-nerved, about 15 to 40 cm long, the blade narrowly elliptic, serrate and tapering into a long petiole. Spreads from short rhizomes.

**Inflorescence:** Dense, about as broad as long, the branches recurved-secund. Involucres about 3 to 5 mm, rays from 7 to 12 and minute.

**Achenes:** Covered with short hairs.

**Habitat:** Dry, open places.

Blooms in late July rather than late August like other Goldenrods, hence “early”.



**Gray Goldenrod (*Solidago nemoralis*)**

**Wetland Rating:** No Rating

**Description:** Plants from 0.5 to 1 meter tall, densely pubescent throughout with minute spreading hairs. Largest leaves (5 to 25 cm) are basal, weakly three-nerved and oblanceolate. Leaves become much reduced in the inflorescence. Spreads from short rhizomes.

**Inflorescence:** Paniculiform to long, narrow, and drooping at the tip. Branches often recurved-secund. Bracts of the flower heads imbricate with ciliate margins otherwise glabrous. Five to nine rays per flower head.

**Achenes:** With short hairs.

**Habitat:** Dry, open places often with Early Goldenrod and Common Goldenrod (*S. canadensis*, FACU).

## WHAT'S DEVELOPING- SUNFLOWERS (*Helianthus* and *Heliopsis*)

August 28, 2003

Gary B. Walton

There are nine species of true sunflowers that might be encountered in northeastern Minnesota but only one, Swamp-Sunflower (*Helianthus giganteus*), is truly common. The others (*H. annuus*, *H. petiolaris*, *H. mollis*, *H. occidentalis*, *H. pauciflorus*, *H. X laetiflorus*, *H. tuberosus*, and *H. maximillianii*) are casual introductions, waifs, or sporadically adventive. In our area they are often found in disturbed sites rather than natural, native communities and even Swamp-Sunflower can be found in abundance along old railroad grades.

Everlasting Sunflower (*Heliopsis helianthoides*) is probably adventive from further south and west but is now very common in some parts of northeastern Minnesota so as to appear native.



**Swamp-Sunflower (*Helianthus giganteus*)**

**Wetland Rating:** FACW

**Description:** A tall plant to 3 meters with alternate (sometimes whorled), lanceolate acuminate coarsely toothed leaves. The stems (green to reddish) and leaves are rough-hairy. The roots, while tuberous, are not the same as Jerusalem Artichoke (*H. tuberosus*) tubers that are actually enlarged stems.

The bracts of the yellow flower heads are lanceolate, attenuate and hairy.

Commonly seen in wet soil along old railroad grades. Also occurs in wet meadows and along streams.



**Everlasting Sunflower (*Heliopsis helianthoides*)**

**Wetland Rating:** no rating

**Description:** The flower of *Heliopsis helianthoides* makes it superficially similar to *Heliopsis helianthoides*. However, *H. helianthoides* differs by its opposite leaves and the ray flowers that remain on the achenes.

Often along roadsides, railroad grades and other disturbed usually dry or well drained sites. This and several other prairie species are now being used in seed mixes in "native" habitat restorations in the Boreal Forest region of MN. This is probably preferable to plantings of bird's foot trefoil and smooth brome.

## NATIVE THISTLES (*Cirsium*) PART 1

August 29, 2003

Gary B. Walton

There are about 110 species of *Cirsium* (Family Asteraceae) in North America north of Mexico. In northeastern MN there are six species of Thistle. Two are non-native species from Eurasia (described in Weed of the Week- Thistles) and four are native to North America including MN. Of the four natives, three are probably adventive in northeastern MN, as the natural prairie habitat that they prefer does not exist here although prairie plant communities mixed with Jack Pine, Red Oak, and Bur Oak do occur in southern Carlton County. The Thistles shown in this series on native species were found in St. Louis and Carlton counties along roadsides and railroad grades except for *Cirsium muticum* which was found in a high quality native plant community (sedge meadow/shrub carr).

Thistles are known for their spiny leaves and stems although the amount of armature varies from species to species. Some are biennials while others are perennials. Thistles are larva host plants for Metalmark butterflies. Many bees, syrphid flies, butterflies, beetles, and wasps are attracted to thistle flowers for their nectar and pollen. Several species of weevils feed on the developing seeds. Finches and other small birds feed on the seeds, too. Finally, in spite of the spines Thistles are simply beautiful flowers.

The following two species superficially resemble Bull Thistle (*Cirsium vulgare*, FACU-) a state listed noxious weed. Distinguishing between Bull Thistle and similar looking native species is important when evaluating habitat quality.

Characteristics of Thistles (*Cirsium*):

- 1) Prickly or spiny stems and leaves.
- 2) Principal leaves are deeply lobed halfway to mid-vein.
- 3) At least some of the bracts of the flower head with terminal spines. Bracts without marginal fringes. Bracts often with a prominent, sometimes glutinous ridge.
- 4) Heads discoid (no ray flowers).
- 5) Pappus on achenes long plumose (feathery with very long fine lateral branches).
- 6) Achenes glabrous, the apex firm but flexible and pale yellow.
- 7) Sap clear, not milky colored (i. e., no latex).



**Wavy-leaved Thistle (*Cirsium undulatum*)**

**Wetland Rating:** FAC-

**Description:** Native perennial thistle from a taproot with branching side roots that produce additional stems. Wavy-leaved Thistle may grow to 1 meter. The stem and both sides of the leaves are densely white tomentose. Stems not winged, leaves lobed rather than sharply pinnatifid.

**Flower Head:** 2-3 cm across with slightly invaginated base. Bracts softly spine-tipped (to 3 mm) with a sticky glandular-glutinous ridge. Flowers pink-purple. Achenes without an apical band (or very inconspicuous) and becoming glutinous when wet.

**Habitat:** Prairies and other well-drained soils. Probably adventive in northeastern MN but native elsewhere in MN.



**Prairie Thistle** (*Cirsium flodmanii*)

**Wetland Rating:** NI

**Description:** Native perennial thistle, 3-8 dm tall, spreading underground by creeping roots. The leaves are deeply pinnatifid with spine-tipped lance-triangular lobes, shiny green on top and white wooly below.

**Flower head:** Rounded at the base, about 2-3 cm across, the bracts imbricate with a sticky glandular-glutinous ridge and short spines to 3 mm long. Flowers pink, purple or white. Conspicuous yellow band at achene apex.

**Habitat:** Moist prairies and swales. Probably adventive in northeastern MN but native elsewhere in MN.

## WHAT'S DEVELOPING- ASTERS (*Aster*) PART 2

August 29, 2003

Gary B. Walton



**Left: Bristly Aster flowers.**

**Right: Stem and leaf bases of Bristly Aster.**

**Bristly Aster (*Aster puniceus*)**

**Wetland Rating:** OBL

**Description:** Usually one or a few stems arising from a thickened caudex or short rhizome, sometimes with short thick stolons, to 3 m. Stems spreading hispid becoming uniformly hairy in the inflorescence. Leaves mostly cauline, sessile, the auricles clasping, serrate towards tips to entire, scabrous above, glabrous below to spreading-hairy on the midvein, lanceolate to elliptic-oblong, 7 to 16 cm by 12 to 40 mm.

**Inflorescence:** Few to many flower heads on a leafy inflorescence. Involucres 6 to 12 mm, the bracts slender, scarcely imbricate, inner series, at least, long-acuminate to attenuate, not glandular. Rays 30 to 60, blue sometimes rose or white, 7 to 18 mm. Achenes glabrous, sometimes sparsely hairy.

**Habitat:** Forested hardwood and conifer swamps, willow and alder swamps, wet meadows, sedge meadows.

**Similar species:** *Aster modestus* (FAC+) and *A. novae-angliae* (FACW) have glandular hairs in the inflorescence. *A. novae-angliae* has 45 to 100 bright red-purple to rose ray flowers; *A. modestus* 20 to 40 dark purple rays. *A. firmus* (FACW+) is colonial by long rhizomes; the stem is glabrous or sparingly hispid below the inflorescence, the rays blue or lavender, the leaves shiny on the upper surface.

## WHAT'S DEVELOPING- JOE-PYE-WEED (*Eupatorium*)

August 29, 2003

Gary B. Walton

Two species of *Eupatorium* are very common in our area: *E. maculatum* and *E. perfoliatum*. Two other species, *E. purpurea* and *E. rugosum*, are less common. Forms of Joe-Pye-Weed (*E. maculatum*) are sometimes cultivated as an ornamental. All species produce abundant flowers that are visited by many nectar-feeding insects. The *Eupatorium* are reputed to be of medicinal value. However, Boneset (*E. perfoliatum*) is of no use in healing broken bones as it contains compounds that actually deplete the body of calcium and White Snakeroot (*E. rugosum*, no rating and found in upland forests) is decidedly poisonous.



**Above: Joe-Pye-Weed (*Eupatorium maculatum*) flowers (left) and whorled leaves (right)**

### **Joe-Pye-Weed (*Eupatorium maculatum*)**

**Wetland Rating:** OBL

**Description:** This tall (from 0.5 to 2 meters) native perennial is easily recognized by its large terminal clusters of branched clusters of purplish (rarely white) flower heads. Unlike the next species, Boneset (*E. perfoliatum*), the leaves of *E. maculatum* are borne in whorls of 4 or 5 from each node along the stem. In addition, the stem is short hairy and purplish or spotted. Often abundant in sedge marshes, beaver meadows, ditches, and along streams. The similar Spotted-Node Joe-Pye-Weed (*E. purpurea*, FAC) has purple nodes on otherwise glabrous often glaucous stems.



**Above: Boneset (*Eupatorium perfoliatum*) flowers (left) and perfoliate leaves (right)**

**Boneset (*Eupatorium perfoliatum*)**

**Wetland Rating:** FACW+

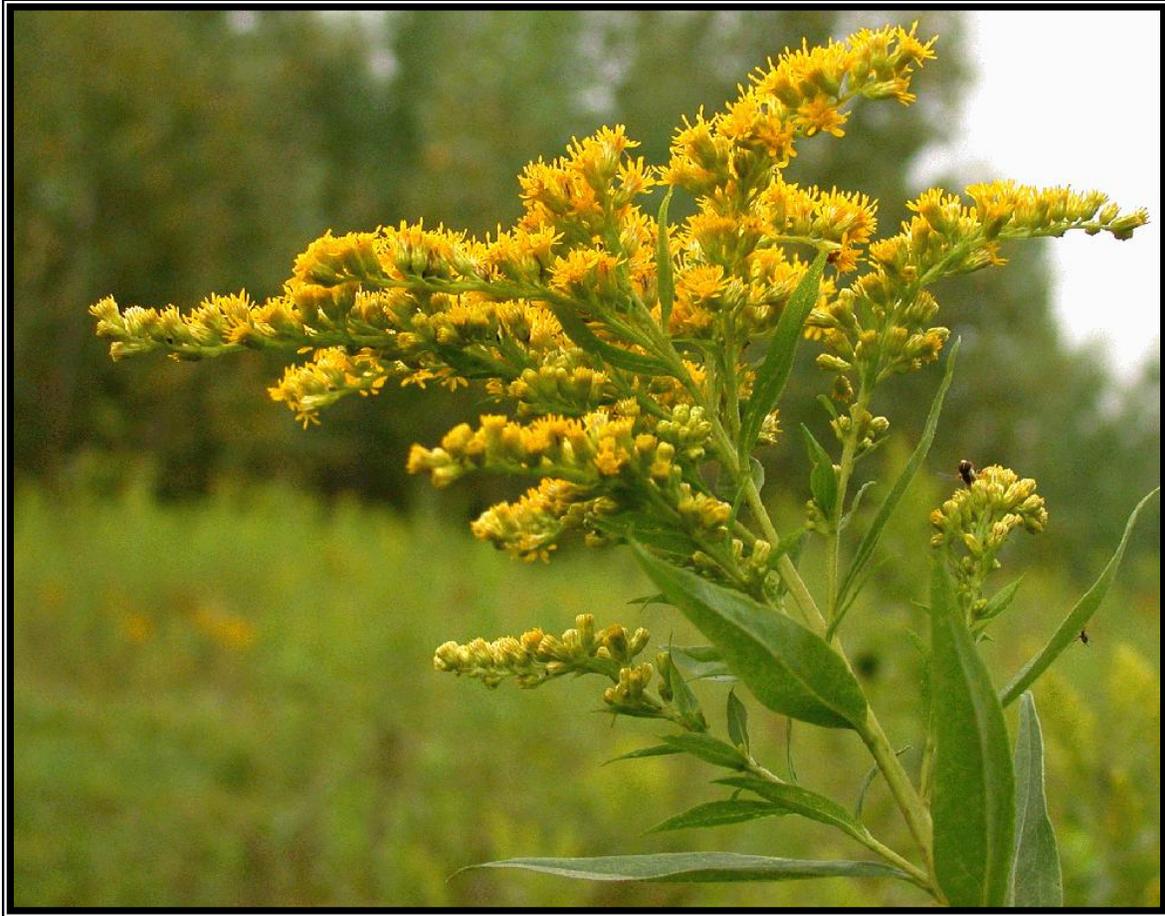
**Description:** A native perennial to 1 meter in height distinguished by its white flower heads and perfoliate leaves. Other distinguishing characters include the extremely hairy stems and leaves. Frequent in moist areas such as wetland edges and along streams but also in sedge marshes. White Snakeroot (*E. rugosum*, no rating) has white flowers but its leaves are opposite and not perfoliate and the stems below the inflorescence are glabrous. It is found in upland forests.

## WHAT'S DEVELOPING- GOLDENRODS (*Solidago* and *Euthamia*) PART 2

August 29, 2003

Gary B. Walton

Smooth Goldenrod (*Solidago gigantea*) and Common Goldenrod (*Solidago canadensis*) are two very similar species in flower now that can be easily confused for each other. Adding to the possibility of mistaken identification is the existence of several varieties of *Solidago canadensis* that come close in some aspects to *Solidago gigantea*. Smooth Goldenrod is rated as FACW and Common Goldenrod as FACU thus knowing the difference is important especially since Common Goldenrod both species can be dominant in some situations.



### **Smooth Goldenrod (*Solidago gigantea*)**

**Wetland Rating:** FACW

**Description:** A perennial from long creeping rhizomes, height to 1 meter with glabrous, glaucous, stems below the inflorescence. Leaves glabrous, rarely with a line of fine hairs along the three main veins below.

**Inflorescence:** Paniculiform, the branches recurved-secund and these and the main inflorescence axis are puberulent to densely pubescent. Involucres 2.5 to 4 mm, rays 10 to 17.

**Achenes:** With short hairs.

**Habitat:** Moist open places.



**Common Goldenrod (*Solidago canadensis* including *S. elongata*, *S. pruinosa*, and *S. altissima*)**

**Wetland Rating:** FACU

**Description:** Plants to 1 meter tall spreading by long rhizomes. Densely puberulent at least above the middle. Stems very leafy, the leaves sessile, lance-linear, coarsely serrate, and depending on the variety lightly to densely puberulent.

**Inflorescence:** Paniculiform, the branches often recurved-secund. Bracts of the flower heads imbricate, thin, acute and yellowish. Ten to seventeen rays per flower head.

**Achenes:** With short hairs.

**Habitat:** Moist or dry open places and sparse woods.

**Distinguishing Tall Goldenrod (*S. altissima*, syn. *S. canadensis* var. *scabra*) from Common Goldenrod (*S. canadensis*) and Smooth Goldenrod (*S. gigantea*)**

Tall Goldenrod (*S. altissima*,) is sometimes separated from Common Goldenrod (*S. canadensis*) and sometimes included as a variety of it as *S. canadensis* var. *scabra*. Both *S. altissima* and *S. canadensis* are rated as FACU and the distinction to separate species seems minor on that point. However, some authors do recognize them as separate species (see Voss's Volume 3 of the Michigan Flora 1996) while others (Gleason and Cronquist 1991) make no such distinction. Differences between *S. altissima* and *S. canadensis* (all varieties except var. *scabra*, of course) are as follows:

- 1) Pubescence dense and covering the plant nearly to the base.
- 2) Upper leaf surfaces merely scabrous or even glabrous.
- 3) Flowering heads somewhat large, not numerous, the involucre between 2 and 3 mm long, the rays over 2.5 mm, disk flowers numbering 3 to 7, ray flowers around 13; leaves firm and few toothed to entire. Measurements require a ruler not an eyeball guess for accuracy. In addition, several involucres from more than one flower head should be measured.

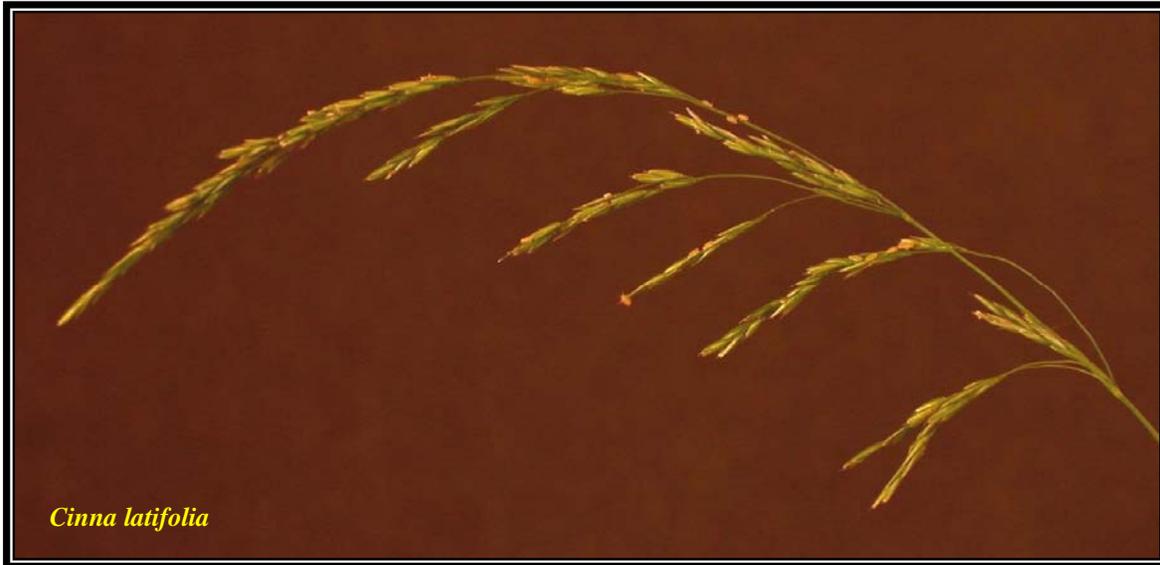
All these characteristics must be present for a *Solidago* "canadensis" plant to be *S. altissima*. If they are not then you are probably looking at some other variety of *S. canadensis* (assuming the specimen is correctly identified to this section of *Solidago*). If some of these characteristics are present except for the stem pubescence then you are very likely looking at *S. gigantea*.

## WHAT'S DEVELOPING- GRASSES (POACEAE) PART 6

September 7, 2003

Gary B. Walton

**AGROSTIDAE:** *Cinna*, *Brachyletrum*, *Calamagrostis*, *Alopecuris*



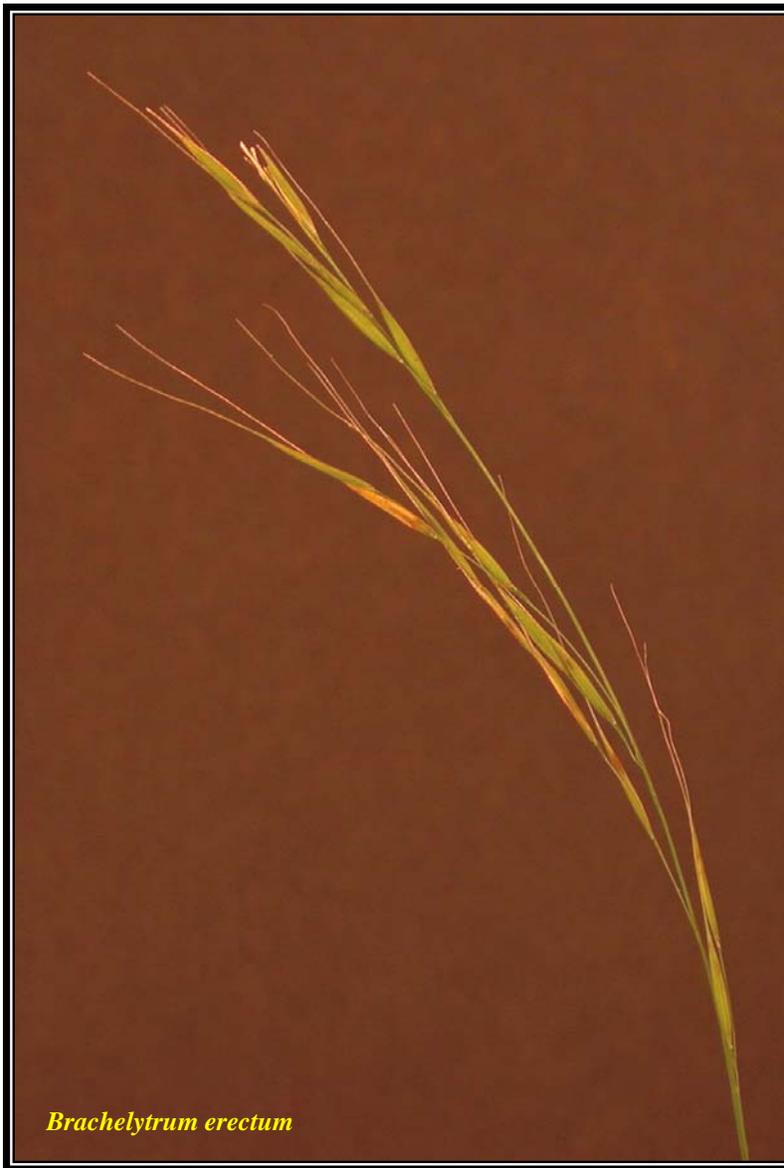
### **Slender Woodreed Grass (*Cinna latifolia*)**

**Description:** *Cinna latifolia* is one of five species of *Cinna* distributed in North and South America and temperate portions of Eurasia. *C. latifolia* is distinguished from the similar Common Woodreed Grass (*C. arundinacia*, FACW) by differences in venation on the second glume- 3 veins for *C. arundinacia* and only 1 vein for *C. latifolia*. The second glume is glabrous except for a scarious keel for about half its length and ends with a 1.5 mm awn. The glumes are roughly 3 to 3.3 mm long, and the lemmas herbaceous (leaf-like in texture). Panicle branches of *C. latifolia* are loosely flowered and tend to droop. Leaves of *C. latifolia* are up to 15 mm wide with colorless ligules and on culms 10 to 15 dm.

**Wetland Rating:** FACW+

**Habitat:** Moist woods.

**Short-Husk Grass (*Brachelytrum erectum*)**



**Description:** *Brachelytrum erectum* is the only member of its genus and is found in North America from Newfoundland to Ontario, Minnesota and Kansas south to Georgia, Louisiana and Oklahoma and then again in east Asia. There are two varieties in North America. Ours is *B. erectum* var. *septentrionale* which is distinguished by leaf margins with more than 15 cilia per 5 mm, florets from 8 to 10 mm, lemmas 3- or 5-nerved with glabrous to scabrous or hispidulous margins (the hairs to 0.2 mm) and anthers to 4 mm.

General characteristics of the genus are glabrous to hairy culms to 10 dm, the sheaths retrorse hairy, leaf margins ciliate, the panicle erect to bent, first glume often not present, or if present then 0.8 mm, the second glume 1 to 4 mm, lemmas scabrous on the margins, 6 to 10 mm and tipped with a 12 to 25 mm awn.

**Wetland Rating:** no rating

**Habitat:** Moist woods.

**Bluejoint Reedgrass or Canada Bluejoint Grass (*Calamagrostis canadensis*)**



**Description:** *Calamagrostis canadensis* is part of a very large temperate and cool region genus that contains over 150 species.  $2n$  for most species is 28 but chromosome numbers can be 42, 66, 70, 84, or even 126. It can be seen from this series of numbers that not all ploidy-levels are multiples of the basic  $2n = 28$ . Plants with high ploidy-levels are usually apomictic resulting in some very geographically isolated species.

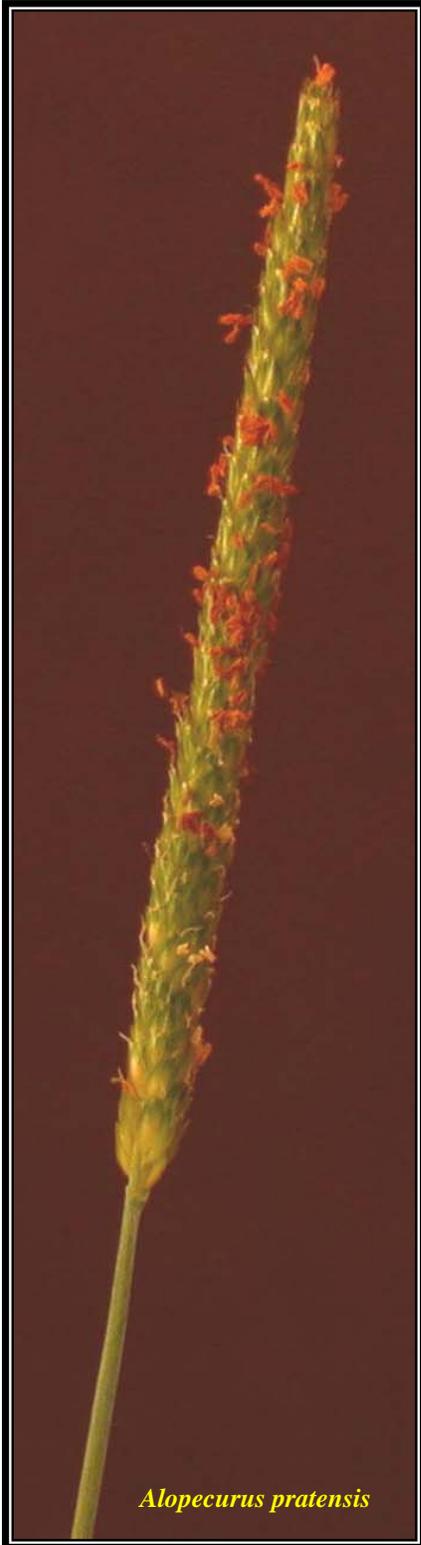
The *Calamagrostis* are distinguished from other grasses by 1-flowered spikelets, glumes subequal, lemmas as large as or shorter than the glumes and with five faint veins. One lemma bears a dorsal awn that may be straight or with a twist and may also be genticulate (abruptly bent). At the base of the lemmas is a ring of hairs from the callus.

There are four species of *Calamagrostis* in Minnesota but three of these are very uncommon and grow in unique habitats. *C. canadensis* has a loose inflorescence with callus hairs nearly as long as the lemma, the lemma awn inserted near the middle and more or less straight. Leaf sheaths are glabrous but the leaf blades are scabrous on both sides. *C. canadensis* is strongly rhizomatous and can form large colonies.

**Wetland Rating:** OBL

**Habitat:** Many kinds of wetlands especially marshes, wet meadows and hardwood swamps. Also on moist soils either in openings or in forests.

### Meadow Foxtail (*Alopecurus pratensis*)



**Description:** *Alopecurus pratensis* is a non-native grass planted for hay and forage on moist soils. It is a perennial to 8 dm with a spike 2 to 8 cm long by 5 to 10 mm wide. Unlike Timothy Grass (*Phleum pratense*, FACU) which it resembles, *A. pratensis* (and all other *Alopecurus*, as well) has an awn attached to the lemma.

Glumes of *A. pratensis* are 4 to 5.5 mm long, the keel narrowly winged and ciliate. The awn, which is attached below the middle of the lemma is genticulate and 2.3 to 6.5 mm long. The native Short-Awned Foxtail (*A. aequalis*) has glumes 2 to 2.7 mm long, connate near the base, and blunt and scarious near the tip. The awn, attached below the middle of the lemma, is straight. *A. aequalis* is an annual or short-lived perennial.

**Wetland Rating:** FACW for *A. pratensis* and OBL for *A. aequalis*.

**Habitat:** Meadows and fields for *A. pratensis* and shallow water such as ephemeral pools, beaver ponds, and slow streams for *A. aequalis*.

## NATIVE THISTLES (*Cirsium*) PART 2

September 8, 2003

Gary B. Walton

Two more native thistles although only Swamp Thistle (*Cirsium muticum*) is truly native to northeastern Minnesota. Pasture Thistle (*C. discolor*) like Prairie Thistle (*C. flodmanii*) and Wavy-Leaved Thistle (*C. undulatum*), is probably adventive from prairie and grassland regions to the south and west.



### **Swamp Thistle (*Cirsium muticum*)**

**Wetland Rating:** OBL

**Description:** A biennial or short-lived perennial native thistle, to 1 meter tall, with many flowering branches on well-developed individuals. The light green nearly hairless leaves are deeply pinnatifid but only weakly spiny.

**Flower head:** Bracts imbricate with glutinous ridge, cobweb-like tomentum. Uppermost bracts with short spines, others without spines. Flowers rose-purple, rarely white.

**Habitat:** Swamps, bogs, marshes, fens, wet meadows, moist woods.



**Pasture Thistle** (*Cirsium discolor*)

**Wetland Rating:** no rating

**Description:** A perennial native thistle, 1.5 to 3 meters tall, with abundant flowering branches. The leaves are deeply pinnatifid, the segment tipped with a spine. Stem tomentose near top, leaves scarcely so.

**Flower head:** Bracts imbricate without glutinous ridge, bracts with yellowish spines from 3.5 to 6 mm long. Flowers pink-purple, rarely white.

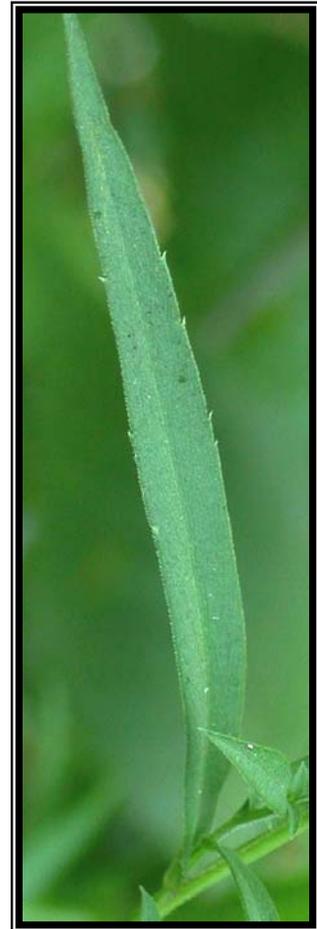
**Habitat:** Clearings, roadsides dry or moist but not swampy. Probably adventive in northeastern MN but native elsewhere in the state.

### WHAT'S DEVELOPING- ASTERS PART 3

September 8, 2003

Gary B. Walton

#### The *Aster lanceolatus* complex



**Left: Inflorescence of *Aster lanceolatus*.**

**Right: Leaf of *Aster lanceolatus*.**

**Nomenclature:** White Panicle Aster (a misnomer already since the flowers may also be pale blue) is *Aster lanceolatus*. It is not *Aster simplex* a name given to a species of hybrid origin involving *A. laevis* and a variety of *A. lanceolatus* (see page 582 in Gleason and Cronquist 1991). Voss (1996) and Semple, Heard, and Xiang (1996) regard *A. simplex* as an obsolete synonym for *Aster lanceolatus*. Use of *Aster simplex* instead of *Aster lanceolatus* is erroneous. None of these authors mention or otherwise recognize *Aster X lanceolatus*.

The *Aster lanceolatus* most likely to be encountered in MN is *A. lanceolatus* subspecies *lanceolatus* var. *lanceolatus*. Use of this unwieldy name is necessary only when discussing two or more subspecies or varieties of *A. lanceolatus*. The blue flowered *A. lanceolatus* subspecies *lanceolatus* var. *hesperius* is sometimes found in MN. However, other varieties of *A. lanceolatus* may have blue or lavender colored flowers, too.

**Description:** *Aster lanceolatus* is a tall 6 to 15 dm rhizomatous colonial perennial plant with lance-linear cauline leaves. These are usually glabrous to slightly scabrous, serrate to entire, sessile or with a petiole-like base and scarcely clasping. The stem is pubescent in lines. The strongly imbricate bracts of the involucre are sharply acute, narrow and glabrous or occasionally ciliate margined and end in an appressed green tip. Ray flowers number from 20 to 40 and are white in most varieties. The inflorescence is many headed and leafy.

Chromosome numbers are extremely variable in var. *lanceolatus* ( $2n = 48, 56,$  or  $64$  and with aneuploid variants), which may account for many morphological variations. Other factors include possible hybridization with related aster species (with *A. ciliolatus*, *A. lateriflorus*, and *A. borealis* among the possible species) and environmental conditions.

Similar species to *A. lanceolatus* in our area include *A. borealis* (*A. junciformis* an incorrect name), OBL rating, bracts imbricate with purple tips or margins, flowers white or blue, and *A. lateriflorus*, FACW-, bracts imbricate in few series, obtuse to acute with an evident broad green tip, often suffused with purple.

**Habitat and wetland rating:** According to National List (1988) of wetland plants for Region 3 a plant called *Aster X lanceolatus* is a non-indicator (NI) species. The Minnesota List (no date but post-1994) repeats this. However, Gleason and Cronquist (1991), Voss (1996), and Semple, et al. (1996) describe habitat for *Aster lanceolatus* as “moist low places”, “damp open ground”, “riverbanks, edges of woods and swamps”, “roadsides”, and “mucky soils”.

## WHAT'S DEVELOPING- ASTERS PART 4

September 9, 2003

Gary B. Walton

### Flat-Top White Aster (*Aster umbellatus*)



**Above:** Flower heads of *Aster umbellatus*

**Wetland Rating:** FACW+

**Description:** Flat-Top White Aster (*Aster umbellatus*), is a tall (10 to 20 dm) perennial plant from creeping rhizomes, somewhat pubescent in the inflorescence but otherwise with glabrous stems. Leaves are cauline and entire, tapering at both ends and lance-elliptic or narrowly elliptic from 4 to 16 cm long by 7 to 35 mm wide. Inflorescence corymbiform and densely flowered with 30 to 300 or more flower heads. Rays 6 to 14 and white, bracts glabrous, imbricate and greenish.

**Habitat:** Flat-Top White Aster occurs in moist low places, wet woods, swamps, and sedge marshes.



**Top: Sessile leaf attachment of *Aster umbellatus*.**  
**Bottom: Whole leaf of *A. umbellatus*.**

**WHAT'S DEVELOPING- GOLDENRODS (*Solidago* and *Euthamia*) PART 3**

September 9, 2003

Gary B. Walton

**Zig-Zag Goldenrod (*Solidago flexicaulis*)**



**Zig-Zag Goldenrod (*Solidago flexicaulis*)**

**Wetland Rating:** FACU

**Description:** A rhizomatous perennial to 1.2 meters but usually less with somewhat zig-zagging stems especially towards the top. Leaves cauline and sharply toothed, hirsute below on main veins and mid-vein, blade ovate-elliptic and contracted to a winged petiole. Leaves becoming smaller towards top of stem.

**Inflorescence:** A series of short axillary clusters. Rays 3 to 4.

**Habitat:** Woods such as maple/oak/basswood forests in shade.

**WHAT'S DEVELOPING- WATER HEMLOCK (*Cicuta*)**  
**AND WILD PARSNIPS (*Sium* and *Heracleum*)**

September 9, 2003

Gary B. Walton



Clockwise from upper left: *Sium suave* flowering umbel, leaf, and maturing fruit.

**Water Parsnip (*Sium suave*)**

**Wetland Rating:** OBL

**Description:** Water Parsnip (*Sium suave*) is a fibrous rooted perennial with thick, angular solitary stems from a short crown. Principle aerial leaves pinnate with 7 to 17 linear to lance ovate leaflets. Submerged leaves bipinnately dissected. Umbels both terminal and lateral up to 12 cm wide, the flowers white. Fruit (schizocarp) oval, 2 to 3 mm.

**Habitat:** Often in shallow standing water of ephemeral pools. Also marshes, shores, ditches.



**Spotted Water Hemlock (*Cicuta maculata*)**

**Wetland Rating:** OBL

**Description:** Spotted Water Hemlock (*Cicuta maculata*) is a thick-stemmed perennial from a cluster of tuberous roots growing to 2 meters. Leaves twice or three times pinnately compound, the leaflets entirely separate, serrate to nearly entire. Umbels to 12 cm wide, numerous. Fruit ovoid to orbicular, 2 to 4 mm, with prominent pale brown ribs and dark intervals in between.

**Habitat:** Swamps, marshes, ditches, shores.

**Similar species:** *Cicuta bulbifera* has small bulblets in the leaf axils.

**Upper left: Leaf and flowering umbel of *Cicuta maculata*.**



**Cow Parsnip (*Heracleum lanatum*)**

**Wetland Rating:** FACW

**Description:** Cow Parsnip (*Heracleum lanatum*) is a stout perennial with a single stem from 1 to 3 meters. The stem is pubescent to tomentose with broad, petiulate, once-ternate coarsely toothed and palmately lobed leaves. Flowering umbels 10 to 20 cm across, the flowers white. Fruit obovate to obcordate, 7 to 12 mm and frequently pubescent.

**Habitat:** Rich moist soil

**Lower left: Leaf of *Heracleum lanatum*.**

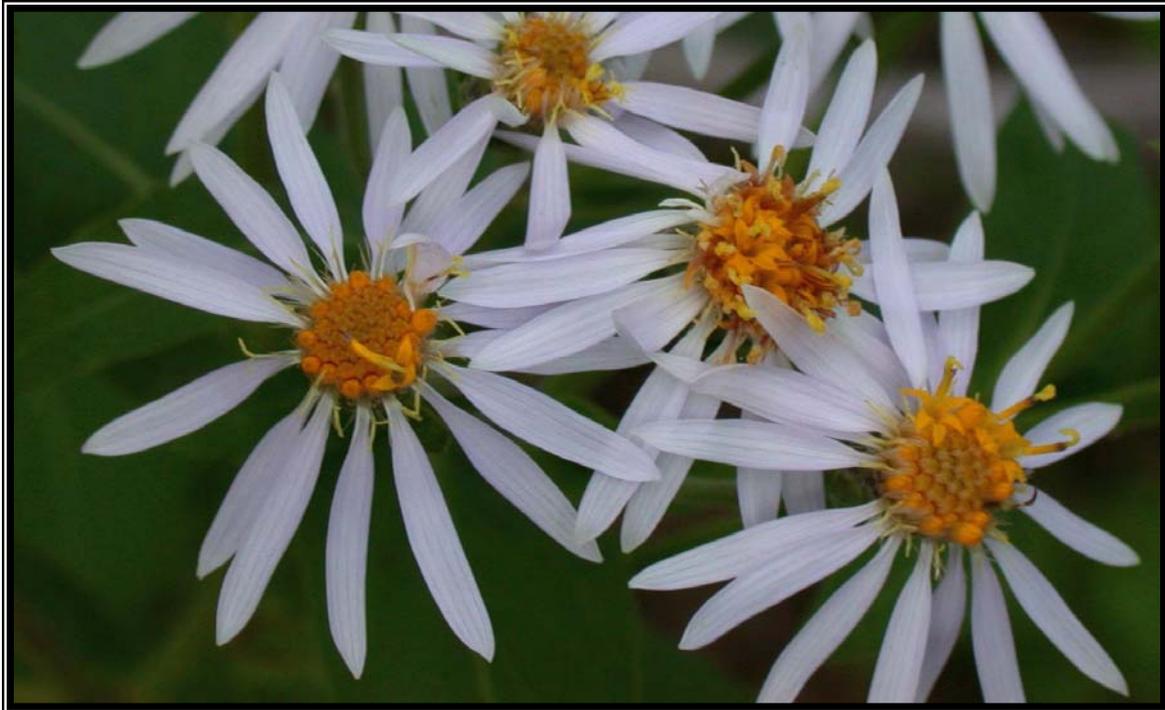
**NOTE:** While many members of the Apiaceae such as carrots, dill, parsley and so on are edible and cultivated for food a fair number of non-cultivated and some cultivated species as well are toxic or even deadly poisonous.

## WHAT'S DEVELOPING- ASTERS PART 5

September 11, 2003

Gary B. Walton

### Big-Leaf Aster (*Aster macrophyllus*)



### **Big-Leaf Aster (*Aster macrophyllus*)**

**Wetland Rating:** no rating

**Description:** This native rhizomatous perennial is known for its large (4 to 30 by 3 to 20 cm) cordate basal leaves with coarse serrations and scabrous hairy upper and lower surfaces. Often, the leaves are glandular with a fragrance like walnut husks.

**Flower heads:** Seldom produced in heavy shade. Few to many heads with blue or white ray flowers (9 to 15 per head and 8 to 13 mm long) in a corymbiform inflorescence. Bracts often glandular and with a short pubescence, imbricate, appressed, rounded to sharply acute.

**Habitat:** Many forest types, openings, clearings; usually dry or well-drained soils.

**Photos:** Top shows flower heads of Big-Leaf Aster while lower left shows a typical basal leaf.

## WHAT'S DEVELOPING- BEGGAR'S TICKS (*Bidens*)

September 11, 2003

Gary B. Walton

Eight of our nine *Bidens* species are annuals found in moist habitats. *Bidens beckii* (Water marigold, OBL) is a perennial aquatic found in slow moving water. While typically associated with wet to very wet soils, at least two species (*Bidens vulgata* and *B. frondosa*) will grow along parking lot edges and similar waste grounds that receive occasional overflows of storm water runoff.

*Bidens* are best known for their awned achenes that cling to hair and clothing. The number of awns and the direction of the barbs on the awns are critical diagnostic features in species identification. Other important features include the surface to the achenes (smooth, papillate, hairy), achene shape (two-angled, four-angled, cuneate or not, convex sides or not), leaf shape (simple, compound, lobed), heads with ray flowers or not, and number of phyllaries (leafy bracts around the flower head) and whether they are ciliate or not.

The name *Bidens* is from the Latin word for a two-toothed hoe and not the Senator.



**Nodding Beggar-Ticks**  
(*Bidens cernua*)

**Wetland Rating:** OBL

**Description:** An annual with entire to coarsely toothed leaves, sessile and clasping to connate at the base. The ray flowers are prominent, measure 1 to 1.5 cm, and are bright yellow. Mature flower heads nod to one side. Achenes 5 to 8 mm long, pale, convex apically, with 4 (rarely 2) antrorsely barbed awns.

Nodding Beggar-Ticks can be a very tall plant with many branches but environmental conditions often produce small plants with few flower heads or branches.

**Habitat:** Muddy shores and banks, ditches.



**Devil's Beggar-Ticks**  
(*Bidens frondosa*)

**Wetland Rating:**  
FACW

**Description:** A more or less glabrous annual with serrately margined petiolate tripartate leaves. The terminal leaflet on a petiolule. No ray flowers, the 5 to 10 phyllaries ciliate. Achenes flat, 1-nerved, 5 to 10 mm long, brown to black at maturity, appressed-hairy, and with 2 retrorsely barbed awns (rarely antorsely).

**Habitat:** Muddy shores and banks, ditches.

## WHAT'S DEVELOPING- GOLDENRODS (*Solidago* and *Euthamia*) PART 4

September 11, 2003

Gary B. Walton

### Bog Goldenrod (*Solidago uliginosa*)



#### **Bog Goldenrod (*Solidago uliginosa*)**

**Wetland Rating:** OBL

**Description:** A perennial to 1.5 meters from a long branched caudex, glabrous except for the occasionally puberulent stems and branches of the inflorescence. Leaves basal but not in a well-defined rosette as in *S. junicea* (see Goldenrods Part 1 August 28, 2003). Leaves petiolate with a sheathing base, oblanceolate to elliptic, acute, subentire to serrate, 10 to 35 cm by 6 to 0.5 cm. Upper leaves similar but much reduced.

**Inflorescence:** Paniculiform varying from elongate, narrow, few-headed and secund to elongate, broad, many-headed and not secund. Rays 1 to 8.

**Habitat:** Bogs and similar wet areas often in circumneutral to calcareous soils.

## WHAT'S DEVELOPING- GOLDENRODS (*Solidago* and *Euthamia*)

September 13, 2003

Gary B. Walton

### Grass-Leaved Goldenrod (*Euthamia graminifolia*)



Grass-Leaved Goldenrod (*Euthamia graminifolia*)

**Wetland Rating:** FACW-

**Description:** An erect plant from creeping rhizomes to 1.5 meters. Stems glabrous to pubescent, leaves cauline only. Leaves linear-lanceolate, 5 to 7 cm by 0.4 to 1.2 cm, acuminate, short petioled to nearly sessile, glabrous to pubescent with three prominent nearly parallel veins and punctate glands. Margins very finely toothed.

**Inflorescence:** Corymbiform to rounded, of several smaller clusters of flower heads of unequal height. Branches glabrous to pubescent. Bracts of flower heads 14 to 16 in an unequal series, ovate, obtuse or acute, resinous. Ray flowers yellow, 17 to 25, 0.1 mm wide, 1 to 1.1 mm long.

**Habitat:** Moist open ground, wet meadows and roadsides.



Leaves of *Euthamia graminifolia* showing sessile attachment, punctate glands, parallel veins, and finely toothed margins.

**WHAT'S DEVELOPING- RANUNCULACEAE PART 1**

***Thalictrum* and *Actaea***

September 13, 2003

Gary B. Walton

***Thalictrum dasycarpum***



**Above: Pinnately compound leaf of *Thalictrum dasycarpum*.**

**Tall Meadowrue (*Thalictrum dasycarpum*)**

**Wetland Rating: FACW-**

**Description:** Tall Meadowrue is a tall plant often growing to 2 or more meters from a crown with a dense root mass. Cauline leaves sessile pinnately compound and divided into 3-lobed leaflets with bluntly acute tips. These may be slightly glandular-puberulent beneath. Tall Meadowrue is dioecious with plants either strictly staminate or strictly pistillate and only very rarely with some perfect flowers. Staminate flowers have 4 to 5 lanceolate, acute, 3 to 5 mm sepals and numerous stamens. When in full bloom the mass of flowers may be cream colored. Pistillate flowers have similar sepals to the pistillate. The stigma is linear and about 2 to 4.5 mm long. These are usually white but can be purple in some individuals. Fruit an achene about 4 to 5 mm long, the achenes in a semi-hemispherical head of 4 to 10.

**Habitat:** Moist soils, stream banks, shores, wet meadows.



*Thalictrum dasycarpum*

Flowers of *Thalictrum dasycarpum*

Upper left: Staminate flowers of *Thalictrum dasycarpum*. Sepals, filaments and anthers are visible.

Lower left: Pistillate flowers of *Thalictrum dasycarpum* showing long white stigmas and developing achenes.



*Thalictrum dasycarpum*

*Actaea*



*Actaea pachypoda*



*Actaea rubra*



*Actaea rubra*

Doll's Eye Baneberry (*Actaea pachypoda*, fruiting stalk shown at upper left) and Red Baneberry (*A. rubra*, flowering stalk shown upper right and leaf at lower left) are two berry producing members of Ranunculaceae, most others producing achenes or many-seeded follicles.

**Wetland Rating:** no rating for either species.

**Description:** Perennial herbs to 8 dm arising from a stout caudex. Leaves ternately 2 to 3 times compound, the leaflet with acute tips. Flowers monoecious with 4 to 10 deciduous white petals, numerous stamens and one pistil.

The fruit is a many-seeded white or red berry. The fruiting pedicels of *Actaea pachypoda* are thickened (to 2mm) and light to deep pink to red. Even in flower

the thickened pedicels are obvious. The fruiting pedicels of *A. rubra* are thin (0.4 to 0.7 mm). Also, both species have congested inflorescences but when in the mature fruit stage the inflorescence of *A. pachypoda* becomes elongate with large spaces between pedicels. *A. rubra* remains congested. In this way occasional white-fruited *A. rubra* can be easily told apart from the normally white-fruited *A. pachypoda*.

**Habitat:** For *A. pachypoda* rich hardwoods especially maple/basswood. For *A. rubra* rich hardwoods but also in mixed aspen/birch/fir/spruce forests.

## WHAT'S DEVELOPING- RASPBERRIES AND BLACKBERRIES (*Rubus*) PART 1

September 13, 2003

Gary B. Walton



**Red Raspberry** (*Rubus strigosus*, syn. *Rubus idaeus* subsp. *melanolasius*, *Rubus strigosus* var. *strigosus*)

**Wetland Rating:** FACW-

**Description:** *Rubus strigosus* is a native shrub with canes to 2 meters armed with slender based prickles and stipitate glandular bristles (visible in photograph above). Leaves, petioles, stipules, and calyx lobes are all beset with stipitate glandular bristles in *R. strigosus*. The related *R. idaeus* (FACU+) lacks such stipitate glandular bristles. It is a Eurasian species cultivated for its fruit and occasionally persisting after or escaped from cultivation. Leaves of *R. strigosus* are 3- or 5-parted, the leaflets ovate to lanceolate, with sharp serrations, grayish pubescence below.

The inflorescence is an umbelliform cyme of 2 to 5 white, 5-petaled flowers. The fruit is a red 1 to 1.5 cm long cluster of drupelets that easily separate from the receptacle when ripe.

**Habitat:** Many situations, dry or moist, sunny or shaded. Often forms thick patches.



**Setose or Bristly Blackberry (*Rubus setosus*)**

**Wetland Rating:** FACW-

**Description:** *Rubus setosus* is an erect to ascending or arching plant with canes to 1 meter. The canes are lightly armed with stiff bristles or soft spines. Common Blackberry (*Rubus allegheniensis*, FACU+) has upright canes to 2 or even 3 meters armed with numerous stiff, sharp spines. *R. setosus* leaves are 3- or 5-parted the leaflets mostly glabrous sometimes hairy to velvety below.

The racemiform or corymbiform inflorescence is few to many flowered, flowers white and five-petaled as in all other *Rubus* species. Pedicels may be covered with stipitate glandular bristles. The black fruit of *R. setosus*, while somewhat good flavored, is difficult to separate from the receptacle unlike the fruit of *R. allegheniensis* which is sweet flavored and easily separated from the receptacle.

**Habitat:** Low moist ground in sun or shade.

## WHAT'S DEVELOPING- RASPBERRIES AND BLACKBERRIES (*Rubus*) PART 2

September 13, 2003

Gary B. Walton



### **Western Thimbleberry (*Rubus parviflorus*)**

**Wetland Rating:** FACU+

**Description:** *Rubus parviflorus* is a shrub to 2 meters with no thorns, new and young growth with stipitate glandular hairs. Leaves are orbicular in outline with about 5 shallow, serrately margined lobes, and from 10 to 20 cm wide.

The five-petaled white flowers are few but large (2 to 4 cm across) on long pedicles in cymose clusters. The fruit is a dome-shaped red cluster of drupelets that separates easily from the receptacle.

**Habitat:** Open woods, rocky woods, trail edges.



**Dewberry, Dwarf Raspberry, or Dwarf Blackberry (*Rubus pubescens*)**

**Wetland Rating:** FACW+

**Description:** *Rubus pubescens* is a trailing woody plant with no thorns and few bristles. Leaves are trifoliate on long petioles, the leaflets rhombic with sharply serrate margins, and acute tips.

Flowers are white (rarely pink), five-petaled in small clusters of 2 or 3 or occasionally just one flower, about 1 cm across. The fruit is a small red to dark red cluster of drupelets 5 to 10 mm thick.

**Habitat:** Moist or wet woods, conifer and hardwood swamps. Sometimes in moist openings, alder thickets, willow thickets.

## WHAT'S DEVELOPING- RANUNCULACEAE PART 2

September 13, 2003

Gary B. Walton

### *Ranunculus* and *Anemone* (including *Hepatica*)



**Tall Buttercup (*Ranunculus acris*)**

**Wetland Rating:** FACW-

**Description:** A non-native perennial spreading hairy throughout, thin-stemmed to 1 meter. Leaves mostly below the middle, reniform, deeply 3-cleft, the segments cuneate and incised into oblong to linear lobed. Flowers bright yellow, five or rarely more petals; stamens and pistils numerous. Achenes flat, margined, obliquely obovate, the cluster subglobose.

**Habitat:** Meadows, moist woods. Common across North America.



**Small Yellow Water Crowfoot (*Ranunculus gmelinii*)**

**Wetland Rating:** OBL

**Description:** A sprawling or floating aquatic with submersed leaves ternately decompose and with linear segments. Aerial leaves (as in photo) reniform, 3-parted with segments 3-cleft, the clefts 3-lobed. Flowers with five (rarely more) yellow petals 4 to 8 mm, and numerous stamens and pistils. Achenes smooth sided, their margins rounded, the stigma beak 0.4 to 0.7 mm.

**Habitat:** Slow moving shallow water, shores.



**Pennsylvania Buttercup or Bristly Crowfoot (*Ranunculus pennsylvanicus*)**

**Wetland Rating:** OBL

**Description:** Bristly Crowfoot is a spreading hairy annual or perennial to 0.75 meter with erect stems, soon deciduous basal leaves and few cauline leaves. The leaves are trifoliate, segments 3-lobed and deeply toothed or incised. Flowers not numerous, petals yellow, obovate, 2 to 4 mm. Achenes subrotund, sharply margined, the beak straight or curved, and measure 1.8 to 2.7 mm in an roughly cylindrical head to 15 mm long.

**Habitat:** Swamps, marshes, and other wet places.



**Canada Anemone (*Anemone canadensis*)**

**Wetland Rating:** FACW

**Description:** Canada Anemone is a rhizomatous herbaceous perennial to 80 cm with long petioled deeply tripartate basal leaves. The segments are deeply cleft, sharply toothed and somewhat pubescent. Leaves of the involucre are similar but sessile. Flowers 2 to 4.2 cm across with 5 white sepals (these are not true petals) and numerous stamens and pistils (typical of many Ranunculaceae). Achenes, borne on a subglobose head (not thimble-like as in *A. cylindrica*, for example, see “NOTE” below), are flat, strigose (straight, appressed hairs pointing in one direction), 3 to 5 mm long with a style 2 to 5 mm long.

**Habitat:** Shores, wet meadows.



**Woodland Anemone (*Anemone quinquefolia*)**

**Wetland Rating:** FAC\*

**Description:** Woodland Anemone (not “Small Flowered Thimble-Weed”, see “NOTE” below) is a rhizomatous herbaceous perennial with flowering stems from 8 to 20 cm. The flower is similar in structure to Canada Anemone but the sepals may be reddish below and some are light pink until pollinated. The achenes are also borne in a subglobose head, but fusiform, 3 to 4.5 mm and short-hirsute. Leaves are mostly solitary, tripartate the segments coarsely lobed or toothed. In the photo the leaves appear greenish-purple but this picture was taken in early summer. The leaves eventually become green.

**Habitat:** Moist or dry woods, hardwood or coniferous, moist meadows.



**Round-Lobed Hepatica (*Hepatica americana* or *Anemone americana*)**

**Wetland Rating:** no rating

**Description:** Round-Lobed Hepatica is considered to be a member of *Anemone* despite the round leaves. The major difference is in the basal and involucral leaves. In *Anemone* basal, cauline, and involucral leaves are well developed while in *Hepatica* the cauline leaves are represented only by three small involucral leaves that closely subtend the flowers. Flowers of Round-Lobed Hepatica are blue to white, with 5 to 12 sepals, and numerous stamens and pistils. Achenes are conic to fusiform, hairy, about 3 to 4 mm long. In many ways very much like *Anemone*.

**Habitat:** Dry woods especially hardwoods.

**NOTE:** The Minnesota List of Plant That Occur in Wetlands, and many other lists as well, is rife with contrived common names. The common names (as if anyone uses these over a wide area) given to the *Anemone* are a clear case of contrived names and a case of trying to apply some sort of “rule” to the use of so-called common names. All of the *Anemone* species on the Minnesota List are called “Thimble-Weed” of one sort or another. The name “Thimble-Weed” is actually a corruption of a perfectly acceptable common name (“Thimble Flower”) for several species of *Anemone* with achenes covered by a cottony pubescence and borne in dense clusters on long cylindrical heads. “Thimble flower” is best applied to *Anemone virginiana* and *A. cylindrica*. The other *Anemone* do not have such achene heads, being either rounded and low with short hairy to nearly glabrous achenes or in the case of *Anemone patens*, achenes with long plumose hairs. In fact some buttercups (*Ranunculus*) have seed heads that are much more thimble-like. The Latin binomials and trinomials (for varieties and subspecies) are given to species according to globally accepted conventions. *Anemone virginiana* means the same thing and refers to one and only one species in Russia, America, or anywhere else on the planet. Tall Thimble-Weed does not and could have different applications even within the same national boundaries.

## **WHAT'S DEVELOPING- FERN LEAVES PART 1**

### **Oak Fern (*Gymnocarpium dryopteris*), and Northern Beech Fern (*Thelypteris phegopteris*)**

September 15, 2003

Gary B. Walton

#### **Fern Terminology**

Costa- any prominent rib or vein, in ferns the veins of the pinnae or pinnules.

Fronde- the leaf of a fern including the petiole, rachis, and leaf segments.

Indusia, indusium- an outgrowth or inrolled leaf margin in ferns that covers the sori.

Pinnae (singular: pinna) - one of the primary divisions of a pinnately compound leaf.

Pinnule(s) - an ultimate leaflet of a compound leaf that is two or more times pinnate.

Rachis - the main axis of a compound leaf.

Sori (singular: sorus) - clusters of sporangia.

Sporangia - structures containing spores.

Spore - a one-celled reproductive structure, haploid in vascular plants, other than a gamete or zygote.

Stipe - the stalk of a structure.

#### **Useful reference on ferns:**

Flora of North America, Vol. 2. 1993. Pteridophytes and Gymnosperms. Oxford University Press. New York.

Lellinger, D. B. 1985. A Field Manual of the Ferns & Fern-Allies of the United States and Canada. Smithsonian Institution Press, Washington, D. C.

Tryon, R. 1980. Ferns of Minnesota, ed. 2. University of Minnesota Press, Minneapolis.

**Oak Fern (*Gymnocarpium dryopteris*)**



**Wetland Rating:** FAC

**Description:** Petiole 10 to 30 cm, slender with a dark base; blade yellow-green, deltoid-pentagonal, 2- to 3-times pinnate, glabrous or slightly glandular along the rachis. Pinnae several pairs, opposite, the lowest pair deltoid and nearly as long as the blade. Indusium none, sori exposed.

**Habitat:** Moist, cool coniferous woods, moist cliffs, cedar swamps and other conifer swamps. Sometimes in hardwoods.

**Northern Beech Fern (*Thelypteris phegopteris*)**



**Wetland Rating:** no rating

**Description:** Fronds (to 5 dm) scattered on long thin rhizomes. Petiole pillose and scaly. Blade ciliate margined, 1 to 2 times as long as wide, pinnate-pinnatifid, the pinnae confluent with the rachis. Lowest pinnae pair retrorsely divergent. Indusium none, sori exposed.

**Habitat:** Moist woods, damp cliffs.

## WHAT'S DEVELOPING- FERN LEAVES PART 2

September 15, 2003

Gary B. Walton

### Osmunda ferns



**Left: Cinnamon Fern (*Osmunda cinnamomea*)**  
**Right: Interrupted Fern (*O. claytoniana*)**



**Description:** When not bearing fertile fronds or pinnae these two ferns may be easily misidentified. Both are large ferns (fronds to 1.5 meters or slightly larger) from thick dark black rhizomes covered with old leaf bases and fibrous roots. The emerging fronds are covered with a dense pale brown wooly pubescence that is later shed. Cinnamon Fern (*Osmunda cinnamomea*, FACW) has dimorphic fronds. The fertile fronds are achlorophyllous, rusty brown and emerge in the early spring from the center of the crown. These soon wither after the spores are shed. Its leaves have 15 to 20 sub-opposite, sessile, oblong-lanceolate pinnae with alternating obtuse to subacute pinnules. Interrupted Fern (*O. claytoniana*, FAC+) is similar but instead of a fertile frond, it has some of the middle pinnules fertile. Its frond color tends towards blue-green. The pinnules of *O. claytoniana* are rounded not acute or obtuse.

**Habitat:** Swamps, streamsides. *O. claytoniana* also occurs frequently in moist forests.

### WHAT'S DEVELOPING- FERN LEAVES PART 3

September 15, 2003

Gary B. Walton

#### Ostrich Fern (*Matteucia struthiopteris*)



#### **Ostrich Fern (*Matteucia struthiopteris*)**

**Wetland Rating:** FACW

**Description:** Fronds to 3 meters from erect crowns and long creeping rhizomes. Sterile fronds short petiolate, hairy on the rachis and costa, to 50 cm wide. Pinnae numerous, alternate becoming gradually smaller toward the base of the blade and abruptly towards the top. Pinnae long-acuminate with 20 or more pairs of segments not completely cut to the mid-vein. Fertile frond to 7 dm, brown at maturity, the pinnae inrolled.

**Habitat:** Swamps, wet woods, floodplains, and rich soil of intermittent streambeds. Often forming large, dense colonies.

## WHAT'S DEVELOPING- FERN LEAVES PART 4

September 15, 2003

Gary B. Walton

### Sensitive Fern (*Onoclea sensibilis*)



### **Sensitive Fern (*Onoclea sensibilis*)**

**Wetland Rating:** OBL

**Description:** Fronds growing from the top half of long-creeping, branching, somewhat smooth rhizomes. Leaves dimorphic: sterile deciduous, fertile persistent, black or dark brown the pinnae inrolled resembling beads with sori inside and covered by a hood-like indusium. Sterile leaves deeply pinnatifid, the 8 to 12 pairs of opposite pinnae confluent with the rachis, wavy margined, reticulate venation, blade 18 to 40 cm, overall to 1 meter.

**Habitat:** Swamps, marshes, streamsides, shores, wet woods.

## WHAT'S DEVELOPING- FERN LEAVES PART 5

September 15, 2003

Gary B. Walton

### Bracken Fern (*Pteridium aquilinum*)



### **Bracken Fern (*Pteridium aquilinum*)**

**Wetland Rating:** FACU

**Description:** This widespread fern found across the northern hemisphere forms dense colonies (sometimes covering several acres) from long creeping rhizomes. The frond blades are ternate-pinnate and three times compound, to 0.5 meters across and carried on a stem-like petiole to a height of nearly 1.5 meters although most plants are much smaller.

**Habitat:** In a variety of upland forests and openings.

## WHAT'S DEVELOPING- FERN LEAVES PART 6

September 15, 2003

Gary B. Walton

### Lady's Fern (*Athyrium*) and Shield-Ferns (*Dryopteris*)



#### **Lady's Fern (*Athyrium filix-femina*)**

**Wetland Rating:** FAC

**Description:** The sparsely scaly to minutely glandular fronds of Lady's Fern are clustered near the tip of a short-creeping rhizome growing from 0.5 to 1 meter tall and 10 to 35 cm wide. Blades pinnate to tripinnate. The 20 to 35 pairs of pinnae lance-linear, sessile, the pinnules serrate to deeply parted with forked veins ending in the teeth. Indusia dark brown, thin and ciliate.

**Habitat:** Moist woods and openings, stream banks, thickets.



**Toothed or Spinulose Woodfern**  
(*Dryopteris carthusiana*)

**Wetland Rating:** FACW-

**Description:** Fronds (20 to 70 cm) from a short-creeping rhizome, the blades bipinnate-pinnatifid to tripinnate. The petiole about a third the length of the blade, sparsely covered chaffy brownish concolorous scales. 10 to 15 pairs of pinnae, these mostly oblique, the basal pinnule of the lowest pinnae longer than the one next to it and 2 to 3 times longer than the one sub-opposite to it. Ultimate segments finely toothed.

**Habitat:** Many types of woods, moist to wet, also swamps and meadows.



**Upper left:** Portion of frond of *Dryopteris carthusiana* showing pinnae and pinnules with fine toothing.

**Lower left:** Lowest pinnae of *D. carthusiana* showing extremely long basal pinnule in relation to other pinnules.



**Crested Woodfern (*Dryopteris cristata*)**

**Wetland Rating:** OBL

**Description:** Very different from Toothed Woodfern with leathery, evergreen leaves that appear much less dissected because of the bluntly acute pinnules. Leaves dimorphic: sterile leaves smaller (10 to 40 cm long) somewhat horizontal, the pinnae perpendicular to the rachis, and deciduous; the fertile more erect, larger (35 to 80 cm), the fertile pinnae twisted at an angle rather than perpendicular to the rachis, and semi-evergreen.

**Habitat:** Many types of wet sites such as coniferous swamps, bogs, marshes, and wet woods.

**WHAT'S DEVELOPING- TURTLEHEAD (*Chelone*)**

September 15, 2003

Gary B. Walton



**White Turtlehead (*Chelone glabra*)**

**Wetland Rating: OBL**

**Description:** A perennial to almost 1 meter tall with simple stems sometimes branched near the top. Leaves with a short petiole, lance-ovate, to 15 cm, serrate, acuminate. Flowers 2.5 to 3.5 cm, 5-parted, 4 fertile stamens, bilaterally symmetrical in spikes, subtended by reduced leaves. Color white to yellow or greenish yellow tinged with pink or purple. The middle lower lobe is elevated thus closing the corolla throat.

**Habitat:** Swamps, wet meadows.

# ALPHABETICAL INDEX

**Bold face** = photograph

Asterisk (\*) = discussion/description

## A

- Abies balsamea* 54  
*Acer negundo* 5, 6  
*Acer platinoides* 5, **8\***,  
*Acer rubrum* 5, **6\***, 43, **45**  
*Acer saccharinum* 5, **7\***  
*Acer saccharum* 5, **6\***, 8, 9, 26  
*Acer spicatum* 5, **7\***,  
*Achillea millefolium* **117\***  
*Actaea* 155  
*Actaea pachypoda* 52, **157\***  
*Actaea rubra* 47, **157\***  
*Agropyron repens* 74, **107**, 108\*  
*Agropyron trachycaulum* 108  
*Agrostis alba* 110  
*Agrostis geminata* 111\*  
*Agrostis gigantea* **110\***  
*Agrostis hyemalis* **111\***  
*Agrostis hyemalis* var. *scabra* 111  
*Agrostis hyemalis* var. *tenuis* 111  
*Agrostis scabra* 111  
*Agrostis stolonifera* var. *major* 110  
Alder see *Alnus*  
alder thickets 68, 161  
*Allium tricoccum* **47**  
*Alnus rugosa* 28  
*Alnus rugosa* ssp. *incana* **28\*-29\***, 42  
*Alnus viridis* var. *crispa* **28\*-29\***  
*Alopecurus aequalis* 139\*  
*Alopecurus pratensis* **97**, **139\***  
*Amelanchier* 39  
*Amelanchier arborea* 39  
*Amelanchier bartramiana* 39\*  
*Amelanchier humilis* 39  
*Amelanchier huronensis* 39  
*Amelanchier laevis* **39**  
*Amelanchier mucronata* 39  
*Amelanchier sanguinea* 39  
*Amelanchier spicata* **39**  
*Amelanchier stolonifera* 39  
*Anaphalis margaritacea* **113\***  
*Andromeda glaucophylla* 33  
*Andropogon* 95  
*Anemone americana* 164  
*Anemone canadensis* **163\***  
*Anemone cylindrica* 163\*  
*Anemone patens* 164  
*Anemone quinquefolia* 49, 52, 53, 86  
*Anemone virginiana* 164  
*Antennaria* 49, 66, 113  
*Antennaria microphylla* 66  
*Antennaria neglecta* **66\***, **67**  
*Antennaria parlinii* 66  
*Antennaria plantaginifolia* 66\*, **67**  
*Antennaria rosea* 66\*, **67**  
*Anthoxanthum* 95  
Apiaceae 148  
Apple see *Malus*  
*Apocynum androsaemifolium* 74, **92\***  
*Apocynum cannabinum* 92\*  
*Aralia nudicaulis* 52  
*Arisaema triphyllum* 52  
*Asarum canadense* 44, 47, 52, **53**  
*Asclepias incarnata* 74, **92\***  
*Asclepias speciosa* 91\*  
*Asclepias syriaca* 74, **91\***  
Ash see *Fraxinus*, *Sorbus*  
Asteraceae 66, 93, 113, 117, 121, 124, 128  
*Aster* 121  
*Aster borealis* 121, 143  
*Aster brachyactis* 121  
*Aster ciliolatus* 121, **122\***, 143  
*Aster cordifolius* 121, 122  
*Aster ericoides* 121  
*Aster firmus* 121, 131\*  
*Aster hesperius* 121  
*A. junciformis* 143  
*Aster lanceolatus* 121, **142\***  
*Aster lateriflorus* 121, 143  
*Aster macrophyllus* 121, **149\***  
*Aster modestus* 121, 131\*  
*Aster novae-angliae* 121, 131\*  
*Aster ontarionis* 121  
*Aster oolentangiensis* 121, 122  
*Aster puniceus* 121, **131\***  
*Aster sagittifolius* 121, 122  
*Aster simplex* 142  
*Aster umbellatus* 121, **144\*-145**  
*Aster X lanceolatus* 142  
*Aster X longulus* 121  
*Athyrium filix-femina* **50**, **172\***  
*Avena* 95  
*Avena fatua* **97**

## **B**

*Barbarea vulgaris* 49  
Basswood see *Tilia*  
*Betula allegheniensis* **17\***, **18**  
*Beutla cordifolia* 17  
*Betula papyrifera* **17\***, **18**, 45  
*Betula pumila* (*Betula glandulosa* var. *glandulifera*, *Betula pumila* var. *glandulifera*) 17, **19\***,  
*Betula X sandbergii* **19**  
*Bidens beckii* 150  
*Bidens cernua* 150\*  
*Bidens frondosa* 150, **151\***  
*Bidens vulgata* 150  
Birch see *Betula*  
black ash swamp 16, 103

## **C**

*Calamagrostis canadensis* 74, **138\***  
*Caltha natans* **84\***  
*Caltha palustris* 44, **48**, **84\***  
*Calystegia spithamea* 74  
Caprifoliaceae 34-37  
*Carex* 58  
*Carex arctata* **59\***, 62  
*Carex aurea* 74  
*Carex backii* 46, 57, **63\***  
*C. blanda* 59  
*Carex castanea* 58, 59  
*Carex communis* 46, **60\***  
*Carex crinita* 74  
*Carex deweyana* **62\***  
*Carex foena* 55  
*Carex gracillima* **59\***, 62  
*Carex gracilescens* var. *ormostachya* 59  
*Carex houghtonii* 42, 46, **64\***  
*Carex jamesii* 63  
*Carex lacustris* 59, 85, **88\***  
*Carex lanuginosa* 74  
*Carex lasiocarpa* 85  
*Carex leptonevia* 59  
*Carex peckii* 46, **61\***  
*Carex pedunculata* **44**, **46\***, **61\***, 63  
*Carex pennsylvanica* 46, **60\***  
*Carex retrorsa* **90\***  
*Carex rostrata* 85, **89\***  
*Carex stricta* 42, 57, 58  
*Carex umbellata* 42, 46, **63\***  
*Carex wildenovii* 63  
*Cecropia* moths 68  
cedar swamp 16, 103, 166  
*Centaurea biebersteinii* 93, **94\***  
*Centaurea cyanus* 94\*  
*Centaurea montana* 94\*  
*Chamaedaphne calyculata* 33

black spruce swamp 104  
Blueberry see *Vaccinium*  
bog 32, 33, 35, 37, 78, 115, 140, 152, 174  
*Botrychium dissectum* var. *dissectum* 12  
*Botrychium dissectum* var. *obliquum* **12\***  
*Botrychium matricariifolium* 51, **52**  
*Botrychium multifidum* **12\***  
*Botrychium rugulosum* 51, **52**  
*Botrychium simplex* 57  
*Brachelytrum erectum* **137\***  
*Bromus ciliatus* **101\***  
*Bromus inermis* **97**, **100\***  
*Bromus kalmii* **101\***  
Bunchberry see *Cornus*

*Chelone glabra* **175\***  
Cherry see *Prunus*  
*Chrysanthemum leucanthemum* 74, **118\***

*Cicuta bulbifera* 148\*  
*Cicuta maculata* 74, **148\***  
*Cinna arundinacea* 136\*  
*Cinna latifolia* **136\***  
*Cirsium arvense* **120\***  
*Cirsium discolor* 120, 140, **141\***  
*Cirsium flodmanii* 120, **130\***, 140  
*Cirsium muticum* 120, 128, **140\***  
*Cirsium undulatum* 120, **129\***, 140  
*Cirsium vulgare* **120\***, 128  
*Claytonia caroliniana* 47  
*Clintonia borealis* 52  
Clubmoss see *Diphasiastrum*, *Huperzia*,  
*Lycopodium*  
*Comptonia peregrina* **23\***  
conifer swamps 14, 16, 32, 33, 35, 54, 68, 74,  
81, 85, 131, 166  
*Conyza canadensis* **123\***  
*Coptis groenlandica* 52, **53**, 86  
*Corallorhiza trifida* **104\***  
*Cornus* 5  
*Cornus alternifolia* **9\***,  
*Cornus canadensis* 9, **11\***,  
*Cornus florida* 11  
*Cornus racemosa* **9\***, 74  
*Cornus rugosa* 9, **10\***,  
*Cornus sericea* (*Cornus stolonifera*) 9, **10\***,  
*Corydalis sempervirens* 55  
*Corylus americana* 26, **30\***  
*Corylus cornuta* **30\***, 42  
*Crataegus* 40\*, 57  
*Crataegus chrysoarpa* **40**  
*Crataegus crus-galli* **40**

*Crataegus douglasii* 40\*  
*Crataegus flabellata* 40  
*Crataegus mollis* 40

## **D**

*Danthonia spicata* 55, 63  
*Deschampsia flexuosa* 98\*  
*Dicentra cucullaria* 44, 47, 57  
*Diervilla lonicera* 34, 37\*  
*Diphasiastrum complanatum* 14\*,  
*Diphasiastrum digitatum* 14\*,  
Dogwood see *Cornus*

## **E**

*Echinochloa crusgalli* 105\*  
*Echinochloa crusgalli* var. *frumentacea* 105  
*Eleocharis nitida* 74  
*Elymus trachycaulus* 107, 108\*  
*Elytrigia repens* 108  
ephemeral pools 85, 139, 147  
*Equisetum* 75  
*Equisetum arvense* 49, 51, 75, 79, 80\*  
*Equisetum arvense* forma *campestre* 80\*  
*Equisetum fluviatile* 51, 75, 79\*  
*Equisetum hyemale* 15\*, 75, 76, 77\*  
*Equisetum laevigatum* 75, 76\*, 77  
*Equisetum palustre* 75, 79\*, 80  
*Equisetum pratense* 51, 75, 80, 82\*  
*Equisetum scirpoides* 75, 78\*

## **F**

*Festuca ovina* 57  
floodplain 13, 16, 25, 27, 55, 169,  
fens 17, 19, 32, 33, 57, 83, 85, 140  
forested fens 19

## **G**

*Gaultheria hispidula*  
*Glyceria* 114  
*Glyceria borealis* 114\*  
*Glyceria canadensis* 114, 115\*  
*Glyceria fernaldii* 99  
*Glyceria grandis* 114, 116\*  
*Glyceria maxima* 74

*Cypripedium acuale* 102  
*Cypripedium arietinum* 102

*Dryopteris carthusiana* (*Dryopteris spinulosa*)  
13, 173\*  
*Dryopteris cristata* 14\*, 174\*  
*Dryopteris intermedia* 13  
*Dryopteris X triploidea* 13\*,  
dry woods 35, 37, 86, 101, 113, 163, 164

*Equisetum sylvaticum* 49, 51, 75, 81\*  
*Equisetum telmateia* 75  
*Equisetum variegatum* 75, 78\*  
*Equisetum X ferrissii* 76  
*Erigeron annuus* 123\*  
*Erigeron strigosus* 123\*  
Ericaceae 33  
*Eupatorium maculatum* 132\*  
*Eupatorium perfoliatum* 133\*  
*Eupatorium purpurea* 132\*  
*Eupatorium rugosum* 132, 133\*  
*Euphorbia esula* 87  
*Euthamia* 124  
*Euthamia graminifolia* 124, 153\*-154

*Fragaria virginiana* 86  
*Fraxinus nigra* 16\*  
*Fraxinus pennsylvanica* 6, 16\*

*Glyceria neogaea* 99  
*Glyceria pallida* 99  
*Glyceria septentrionalis* 114\*  
*Glyceria striata* 114\*  
*Gnaphalium* 113  
*Gymnocarpium dryopteris* 50, 165, 166\*

## H

hardwood swamps 81, 138, 161  
Hawthorn see *Crataegus*  
Hazel see *Corylus*  
*Heirochloe odorata* 57  
*Helianthus annuus* 127  
*Helianthus giganteus* **127\***  
*Helianthus maximillianii* 127  
*Helianthus mollis* 127  
*Helianthus occidentalis* 127  
*Helianthus pauciflorus* 127  
*Helianthus petiolaris* 127  
*Helianthus tuberosus* 127

## I

Ironwood see *Ostrya virginiana*

## J

*Juncus balticus* 74  
Juneberry see *Amelanchier*

## K

*Kalmia polifolia* 33

## L

Lakeshores  
*Larix laricina* **43**  
*Ledum groenlandicum* **33**  
*Linnaea borealis* 34, 37\*  
*Liparis loeselli* **102\***  
*Lonicera* 34  
*Lonicera caerulea* 35\*, **36**, 49  
*Lonicera canadense* 35\*, **36**, 49

## M

*Maianthemum canadensis* 52  
*Malus* 41, 57  
*Malus angustifolia* 41  
*Malus coronaria* 41  
*Malus ioensis* 41  
*Malus pyrus* **41**

## N

Nabokov's Blue Butterfly (*Lycaeides idas*) 32

## O

Oak see *Quercus*  
*Oenothera biennis* 74  
*Onoclea sensibilis* **13\***, **170\***  
*Opuntia macrorhiza* 74  
*Oryzopsis asperifolia* 46

*Helianthus X laetiflorus* 127  
*Heliopsis helianthoides* 74, **127\***  
*Hepatica americana* **164\***  
*Heracleum lanatum* 74, **148\***  
*Hieracium* 66  
*Hieracium aurantiacum* **118\***  
*Hieracium caespitosum* 118, 119\*  
*Hieracium piloselloides* **119\***  
*Heirochloe odorata* 57  
*Hippochaete* 75, 76  
Horsetail see *Equisetum*  
*Huperzia lucidula* 51

*Lonicera dioica* 35\*  
*Lonicera hirsuta* 35\*  
*Lonicera involucrata* 35\*  
*Lonicera oblongifolia* 35\*  
*Lonicera tatarica* 35\*, **36**  
*Luzula acuminata* 44, **46**  
*Lycopodium digitatum*  
*Lycopodium complanatum*

Maple see *Acer*  
Marshes 147  
*Matteucia struthiopteris* **13\***, **50**, **169\***  
meadows  
Metalmark butterfly 128  
Monotropaceae 33

*Osmunda cinnamomea* 50, **168\***  
*Osmunda claytoniana* **50**, **168\***  
*Ostrya virginiana* 26  
*Ostrya*  
*Ostrya virginiana* **31\***

## **P**

*Panicum*  
*Petasites palmatus* 52  
*Phalaris arundinacea* 74, **109\***  
*Phleum pratense* **112\***  
*Picea glauca* **49**, 54  
*Pinus*  
*Platanthera hyperborea* 102, **103\***  
Plum see *Prunus*  
*Polygonum aviculare* 42  
*Populus* 25  
*Populus alba* 25, 26\*  
*Populus balsamifera* 25\*, **26\***  
*Populus deltoides* 25\*, **26\***  
*Populus grandidentata* 25, **26\***  
*Populus nigra* 25  
*Populus tremuloides* 25, **26\***, **42**, 43  
*Potentilla argentea* 74

## **Q**

*Q. ellipsoidalis* 2  
*Q. macrocarpus* 1, **2\***  
*Q. macrocarpus* var. *depressa* 2

## **R**

Ranunculaceae 155, 162, 163  
*Ranunculus acris* **162\***  
*Ranunculus gmelinii* 85, **162\***  
*Ranunculus pensylvanicus* **162\***  
*Ribes hirtellum* 49  
*Ribes oxyacanthoides* 49  
*Ribes triste* **49**  
*Rhus*  
*Rhus glabra* **22\***  
*Rhus typhina* **22\***  
*Rhus X borealis* **22**  
*Rosa acicularis* **24\***

## **S**

*Salix bebbiana* **21**, 43, **70\***  
*Salix discolor* **4\***, **20**, 42, 43, **70\***, 70, 72  
*Salix exigua* **21**, **69\***  
*Salix fragilis* 68  
*Salix humilis* **4\***, 43, **72\***  
*Salix lucida* **21**, 57, **73\***  
*Salix nigra* 68  
*Salix petandra* 68  
*Salix petiolaris* (*Salix gracilis*) **20**, 42, 43, **44**, **69\***  
*Salix planifolia* **20**, 43, **70\***, 74  
*Salix pyrifolia* **21**, **74\***  
*Salix serissima* **21**, **73\***  
*Sambucus* 5, 34  
*Sambucus racemosa* ssp. *pubens* **37\***, 49  
*Sanguinaria canadensis* 44, 47, **48**

*Potentilla arguta* 74  
*Potentilla pensylvanica* 74  
*Potentilla recta* 74  
*Prunella vulgaris* 74  
*Prunus* 38  
*Prunus americana* 38\*  
*Prunus nigra* 38\*, 49  
*Prunus pensylvanica* 38\*, **39**, **49**  
*Prunus pumila* 38\*, **39**  
*Prunus virginiana* 38\*, **39**  
*Pteridium aquilinum* 26, **171\***  
*Puccinellia* 114  
*Puccinellia fernaldii* 99  
*Puccinellia pallida* 99  
Pyrolaceae 33  
*Pyrola elliptica* 74  
*Pyrola asarifolia* 74

*Q. macrocarpus* var. *macrocarpa* 2  
*Quercus rubra* 1, 2\*, **3**, 26

*Rosa blanda* **24\***  
*Rubus*  
*Rubus allegheniensis* 159\*  
*Rubus idaeus* 158\*  
*Rubus idaeus* subsp. *melanolasius* 158  
*Rubus parviflorus* **160\***  
*Rubus pubescens* **161\***  
*Rubus setosus* **159\***  
*Rubus strigosus* **158\***  
*Rubus strigosus* var. *strigosus* 158  
*Rudebeckia hirta* 74, **117\***

*Saxifraga pensylvanica* 44  
*Schizachne purpurascens* 63  
*Scirpus cespitosus* 74  
*Scirpus cyperinus* 74  
sedge marshes 132, 133, 144  
*Senecio aurea* 44, 74  
*Setaria glauca* **106\***  
*Setaria italica* **106\***  
*Setaria viridis* **106\***  
shallow pools 84, 85, 116  
shores 78, 85, 88, 105, 109, 114, 147, 148, 150, 151, 155, 162, 163, 170,  
shrub carr 68  
*Sium suave* 85, **147\***  
*Solidago altissima* 135  
*Solidago bicolor* 124

*Solidago canadensis* 124, 126, 134, **135\***  
*Solidago canadensis* var. *scabra* 135  
*Solidago elongata* 135  
*Solidago flexicaulis* 124, **146\***  
*Solidago gigantea* 124, **134\***, 135, **152\***  
*Solidago hispida* 124  
*Solidago juncea* 74, 124, **125\***, 126, 152  
*Solidago nemoralis* 124, **126\***  
*Solidago pruinosa* 135  
*Solidago ptarmicoides* 124  
*Solidago rigida* 124  
*Solidago uliginosa* 124

## **T**

*Tanacetum vulgare* **93\***  
*Taraxacum* 66  
*Thalictrum* 155  
*Thalictrum dasycarpum* 57, **155\*-156**  
*Thelypteris phegopteris* 165, **167\***  
*Tilia americana* **1\***, 26  
*Torreyochloa* 114

## **U**

*Ulmus americana* **27\***, **45**  
*Ulmus rubra* 27\*  
*Urtica dioica* 49

## **V**

*Vaccinium angustifolium* **32\***  
*Vaccinium cespitosum* 32  
*Vaccinium macrocarpon* 32  
*Vaccinium myrtilloides* **32\***  
*Vaccinium oxycoccos* 32  
*Vaccinium vitis-idaea* 32  
*Viburnum* 5, 34  
*Viburnum edule* 35\*  
*Viburnum lentago* **34\***, 57  
*Viburnum rafinesqueanum* **35\***  
*Viburnum opulus* **35\***  
*Viola adunca* 52, **56**, 57\*  
*Viola blanda* 52, **54\***  
*Viola canadensis* **56\***

## **W**

*Waldsteinia fragarioides* **86\***  
wet meadows 110, 127, 131, 138, 140, 153, 155,  
163, 175  
Willow see *Salix*

*Sorbus americana* **41\***  
*Sorbus aucuparia* **41\***  
*Sorbus decora* 41\*  
*Sparganium chlorocarpum* 85\*  
*Sparganium glomeratum* **85\***  
*Sparganium minimum* 85  
*Stipa spartea*  
Sumac see *Rhus*  
swamp 4, 6, 10, 13, 16, 17, 27, 35, 43, 54, 57,  
59, 74, 88, 90, 99, 114, 115, 116, 131, 140, 143,  
144, 148, 162, 168, 169, 170, 173, 175

*Torreyochloa pallida* 85, **99\***  
*Toxicodendron* 22  
*Trientalis borealis*  
*Trifolium pratense*  
*Trillium cernuum* 52  
*Trillium grandiflorum* 44, 52

*Uvularia grandiflora* 52  
*Uvularia sessilifolia* 52

*Viola conspersa* 52, **56**, 57\*  
*Viola cucullata* 52, 57\*  
*Viola eriocarpa* 56  
*Viola labradorica* 57\*  
*Viola lanceolata* 57\*  
*Viola mackloskeyi* 52, 54  
*Viola mackloskeyivar. pallens* 52, **54\***  
*Viola nova-angliae* 52, **55\***  
*Viola pensylvanica* 56  
*Viola pubescens* 52, **56**  
*Viola renifolia* 52, 54\*  
*Viola selkirkii* 52, 57\*  
*Viola sororia* 52, **55\***

willow swamp 104  
willow thicket 161  
*Windsoria pallida* 99