



## MN Wetland Professional Certification Program Wetland Plant ID



**m** BOARD OF WATER AND SOIL RESOURCES

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## 2023 MWPCP Schedule

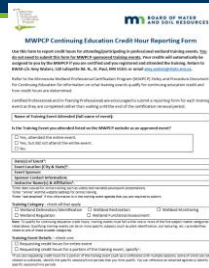
- WCA Regulatory Training- St Cloud MNDOT Training Facility- April 20
- Regional Training: Rochester - May 16-17
- Wetland Delineation and Regulation Basic Class: Arden Hills- June 12-16
- Floristic Quality Assessment (FQA)- MNDOT Shoreview Training Center – June 20
- Basic Wetland Plant ID- Farmington (July 18) or Brainerd (July 20)
- Wetland Delineation Refresher- Prairie Woods ELC- Spicer- August 8
- Regional Training: Fergus Falls – August 15-16
- Wetland Delineation and Regulation Basic Class: Brainerd - September 11-15



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## End of the current renewal period

- Current certification renewal period ends on December 31, 2023 for all who transferred to the MWPCP from the U of MN Wetland Delineation Certification Program.
- Credit reporting deadline for this renewal period is January 1, 2024.
- Submit the [Credit Hour Reporting Form](#) with proof of attendance no later than January 1, 2024.
- Not required to submit a credit hour reporting form for MWPCP courses.
- COVID-related [temporary continuing education policies](#) will lapse at the end of 2023.



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## Next renewal period

- The next credit renewal period begins January 1, 2024 and ends on December 31, 2026.
- [MWPCP Continuing Education policy](#) requires 18 credit hours of MWPCP-approved training.
- Six of those may be online training.



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## MWPCP Wetland Plant ID Agenda



**Morning:**

- Plant ID concepts
- Plant Communities
- How to get plant lists
- Regulatory implications of wetland communities
- Common species: forbs
- Lunch

**Afternoon:**

- Common species: grasses, sedges, rushes
- Common species: trees and shrubs
- Group Field Exercise
- Group discussion & recap

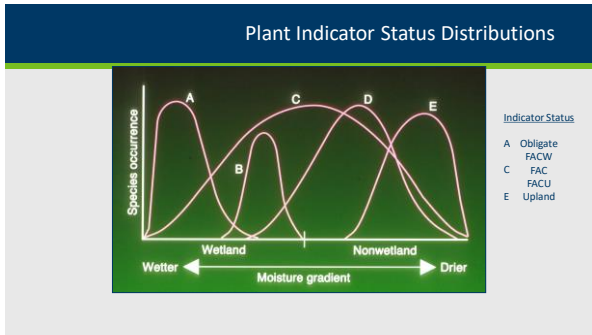
Class Portal: <https://bwsr.state.mn.us/node/4681>

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## Plant Indicator Status

Wetland Indicator Status	Indicator Symbol	Definition
Obligate Wetland	OBL	Plants that almost always grow in wetlands. Estimated probability of >99% for growing in wetland.
Facultative Wetland	FACW	Plants that usually occur in wetlands. Estimated probability of 67% - 99% for growing in wetland (1%-33% in upland)
Facultative	FAC	Plants with similar likelihood of occurring in both wetland and upland. Estimated 33%-67% for growing in wetland.
Facultative Upland	FACU	Plants that sometimes grow in wetland. Estimated 1% - <33% for growing in wetland (>67% - 99% in upland).
Obligate Upland	UPL	Plants that rarely occur in wetland. Estimated probability of <1% for growing in wetland (>99% in upland).

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## The Plant ID Process

**m** BOARD OF WATER AND SOIL RESOURCES

BWSR Academy 2018

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### Identification Steps

- Office Review
- Site Analysis
- Species Identification

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### Office Review

Reviewing aerial images of the site

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### Office Review

Determining what equipment to bring along

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### Office Review

Species Lists

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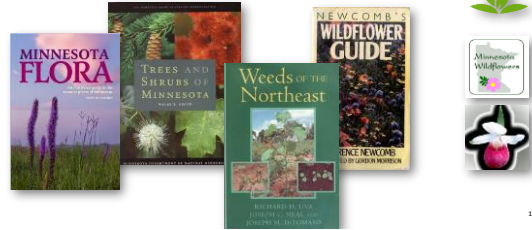
## Office Review



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## Office Review

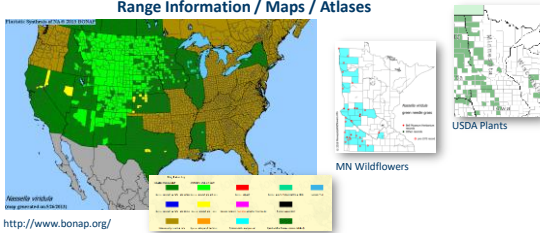
Determining What Plant ID Resources to Bring Along



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## Office Review

Range Information / Maps / Atlases



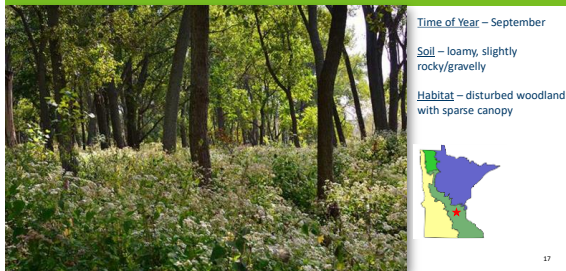
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## Site Analysis



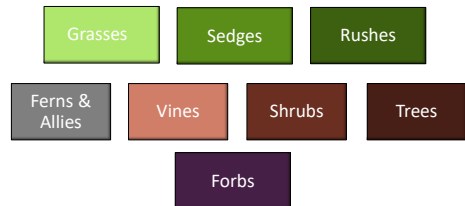
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## Site Analysis



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## Species Identification



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# Plant Characteristics and Identification Learning Module

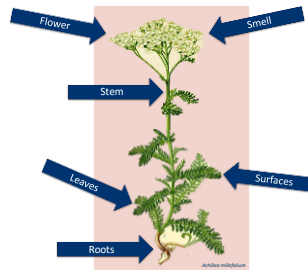
Click here to Start!

Developed by the Minnesota Board of Water and Soil Resources  
May 2017

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Plant Characteristics are the defining features of a plant that can help identify the specific species.

Select a plant part to learn more!



References  
Back to Start

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## Stem Shape

More stem shapes

Stem shape can be distinctive between plants. For example, Sweet-Flag (*Acrostichum americanus*) has a distinct oval shape with flattened sides. In early summer it can easily be mistaken for Cattail or Blue-Flag Iris.



The above stems are Sedge, Bulrush, and Grass stems. In general:

"Sedges have edges. And rushes are round. Grasses are hollow right up from the ground."

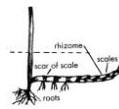


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Back to all Plant Characteristics

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## Stems

**Rhizome** is a horizontal underground stem that puts out lateral shoots and roots (adventitious roots).  
Example: Kentucky Blue Grass (*Poa pratensis*) and Reed Canary Grass (*Phalaris arundinacea*)



**Stolon** is an above ground, creeping horizontal stem or runner that takes root and can put out lateral shoots to form new plants.  
Example: Wild Strawberry (*Fragaria virginiana*)



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Back to all Plant Characteristics

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## Leaves

Leaves are the site where plants make their food through a process called Photosynthesis. Leaves are very unique between plant species and can be one of the most important characteristics to identifying a plant. Leaves, themselves, have many defining characteristics. Select the characteristic below to learn more.



Type Attachment Description of Attachment  
Shape Margins Venation

Back to all Plant Characteristics

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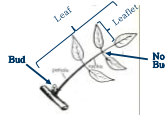
## Leaf Type

There are two types of leaves: Simple and Compound.

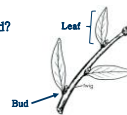


**Compound leaf** is a leaf consisting of several leaflets joined to a single stem.  
Example: Ash tree

**Simple leaf** is a leaf that is joined to a single stem.  
Example: River Birch



Ask yourself:  
• Where is the bud?




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## Leaf Attachment


Leaf Attachment is the pattern by which leaves are attached to a stem. There are four types of leaf attachment: Alternate, Opposite, Whorled, and Basal.




**Alternate:** leaves are attached to the stem in an alternating pattern




**Opposite:** 2 leaves opposite each other at the same point



**Whorled:** 3 or more leaves attached at the same point around the stem




**Basal:** leaves at the base of the plant



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[Back to all Plant Characteristics](#)

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## Description of Attachment




**Petiolate:** When there is a petiole that attaches the leaf to the stem




**Sessile:** When the leaf attaches directly to the stem



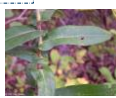
**Perfoliate:** When the leaf goes around the stem



**Clasping:** When the leaf clasps the stem but doesn't go all the way around the stem



**Sheathing:** When the leaf continues down the stem



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
## Leaf Margins

[More Leaf Margins](#)


**Leaf Margin** is the structure of the leaf edge. The most common margins are below. Select the button to learn more types.




**Entire:** even, smooth throughout




**Toothed:** with fine serrations



**Doubly Toothed:** Toothed with sub-teeth



**Lobed:** indented but not to the midline




**Wavy:** Widely wavy

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## Flower Shape




**Regular:** Flowers are symmetrical like the spokes on a bike wheel




**Bell:** The petals are fused together to form a bell shape



**Indistinguishable:** Cannot tell the number of petals or the male and female parts



**Irregular:** Flowers are not symmetrical. They usually have upper and lower lips



**Tubular:** Petals are fused together to form a tube

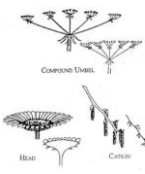
[Back to Leaves](#)

[Back to all Plant Characteristics](#)

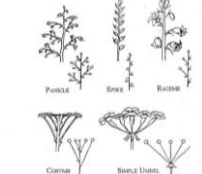
[Back to Flowers](#)

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## Cluster Shape



**Cymes:** Umbel, Corymbose Umbel, Ixoid, Cymoid




**Panicle:** Spike, Raceme, Cyme, Sheath Umbel

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## Fruit and Seeds



**Corn cobs**



**Poppy seed pods**



**Fruit** is the ripened ovary. They can be very distinct, but not present during parts of the year. The time of fruit ripening can also give clues as to the species.

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[Back to Flowers](#)

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## Smell

Smells can be very distinctive. The crushed leaves or seed heads can have smells. Some examples include Sweet flag, the Mint family, and Swamp Milkweed



Sweet Flag smells like sweet lemon



Bee Balm smells like sweet mint



Swamp Milkweed smells like bubblegum



Virginia Mountain Mint smells minty

Back to all Plant Characteristics

## Surfaces

The Surfaces can be soft, rough, prickly, or hairy. There are some distinctions between species that depend on the feel of the stem or leaves. Not only can the stem and leaves have different textures but also the seeds.



Stem of Bidens cernua



The leaves and stems of this plant are rough and hairy



Stem of Staghorn Sumac has soft hairs



Base of an Aster with glandular hairs

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### Wetland Community Mapping and Plant Lists

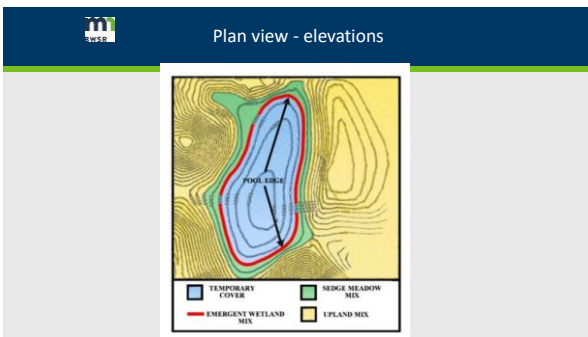
USDA United States Department of Agriculture  
 MASWCD BWSR  
 Kelly Voigt | Regional Training Conservatorist  
 Technical Training and Certification Program

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Plant Community Planting Recommendations				
Upland Prairie	Sedge Meadow Fresh (Wet) Meadow Wet Prairie Shrub Swamp  (Communities with similar hydrology that differences in species dominance)	Shallow Marsh	Deep Marsh	Shallow, Open Water
<p>Soil is deep and well-drained. Good soil with exposed dunes.</p> <p>Establishment of plants needs to take species that are difficult to establish from seed.</p>	<p>Soil is deep, well-drained, sedge meadow and emergent marsh.</p> <p>Establishment of plants needs to take species that are difficult to establish from seed.</p>	<p>Soil is deep with emergent marsh. There are other species that have been established.</p> <p>Establishment of plants, transplants, and propagation have not been done at the edge of operations.</p>	<p>Planted with controlled seed plants, transplants and propagation. No seeding is generally conducted.</p>	<p>Planted with established of plants, transplants, seeds and planting plants. No seeding is generally conducted.</p>

Community type by landscape position

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## Plant Community identification

- Ecological Site Descriptions
- Native Plant Communities

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### Ecological Site Descriptions

More info on Ecological Site Descriptions:  
<https://www.nrcs.usda.gov/getting-assistance/technical-assistance/ecological-sciences/ecological-site-descriptions>

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USDA Natural Resources Conservation Service

## Web Soil Survey

Home About Soils Help Contact Us

Link to: [Web Soil Survey](#) You are here: Web Soil Survey Home

Search: Enter Keyword, All NRCS Sites

Browse by Subject: Soils Home, National Cooperative Soil Survey (NCSS)

START WSS

Want To... Start Web Soil Survey (WSS), Know Web Soil Survey Requirements, Know Web Soil Survey operation hours

Welcome to Web Soil Survey (WSS) Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey (NCSS)

### Gateway to Ecological Site Descriptions spatial data

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### Web Soil Survey

Map Unit Name	Area in A02	Percent of A02
1007 Urban/tennis, shallow (sanitary landfill)	2.9	0.7%
D490 Graycalm loamy sand, 12 to 25 percent slopes	51.3	12.9%
D538 Longue-Barber-Guida complex, 0 to 6 percent slopes	6.1	1.5%
D62A Zimmerman loamy fine sand, 0 to 2 percent slopes	27.9	7.0%
D62B Zimmerman loamy fine sand, 1 to 6 percent slopes	12.6	3.2%

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### Web Soil Survey

Report: Web Soil Description

Crow Wing County, Minnesota

Map Unit Legend

Map Unit Name	Area in A02	Percent of A02
D62A Zimmerman loamy fine sand, 0 to 2 percent slopes	27.9	7.0%
D62B Zimmerman loamy fine sand, 1 to 6 percent slopes	12.6	3.2%
D62C Zimmerman loamy fine sand, 12 to 18 percent slopes	109.0	27.6%
D66A Rifle-Longue complex, 0 to 1 percent slopes	2.7	0.7%
D71A Anoka, Silt, Darkshale and Longue soils, 0 to 1 percent slopes, ponded areas, ponded areas	176.8	44.4%
D77B Genesee Wetlands	7.8	2.0%

Soil Series Description: Zimmerman loamy fine sand, 0 to 18 percent slopes

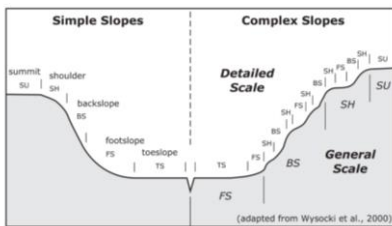
Soil Series: Zimmerman loamy fine sand, 0 to 18 percent slopes

Soil Series: Zimmerman loamy fine sand, 0 to 18 percent slopes

Soil Series: Zimmerman loamy fine sand, 0 to 18 percent slopes

Soil Series: Zimmerman loamy fine sand, 0 to 18 percent slopes

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### Hillslope Positions

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### Official Series Description

#### ZIMMERMAN SERIES

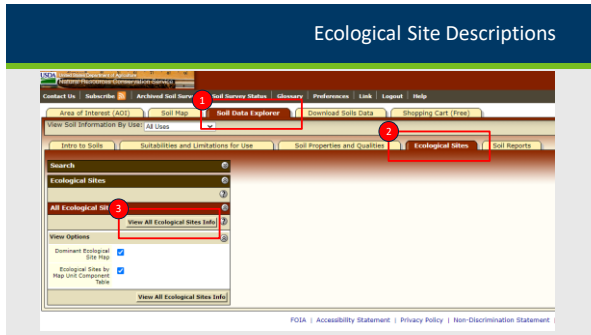
Link to: [Official Soil Series Descriptions name search](#)

The Zimmerman series consists of very deep, excessively drained soils that formed in sandy glacial outwash or eolian sediments on glacial outwash plains, stream terraces, deltas, lake terraces, dunes, beach deposits and valley trains. These soils have rapid permeability. Their slopes range from 0 to 60 percent. Mean annual precipitation is about 28 inches. Mean annual air temperature is about 41 degrees F.

**GEOGRAPHICALLY ASSOCIATED SOILS:** These are the excessively drained Sartell soils, well drained Anoka soils, moderately well drained Cantlin soils, somewhat poorly drained Soderville, and the poorly and very poorly drained Isanti soils. The Sartell, Cantlin, Leno, Soderville, and Isanti soils are in a hydrosequence with the Zimmerman soils. The Anoka soils have an argillic horizon whose lamellae total more than 6 inches thick.

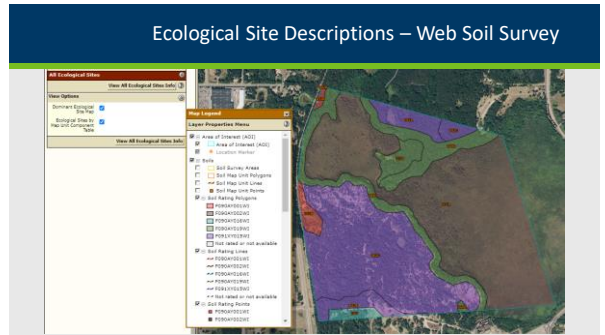
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### Ecological Site Descriptions



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### Ecological Site Descriptions – Web Soil Survey

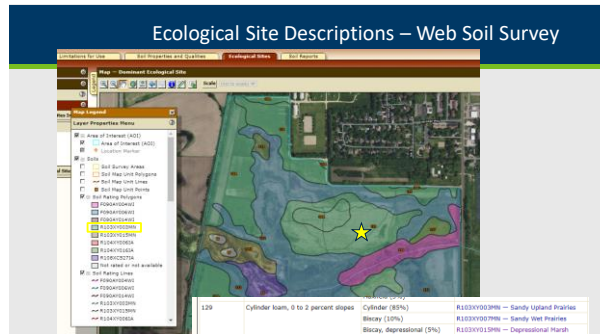


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Map unit symbol	Map unit name	Component name (percent)	Ecological site	Area in Acres	Percent
1007	Urborthens, shallow (sanitary landfill) (100%)	Urborthens, shallow (sanitary landfill) (100%)	FO06A019W1 – Loamy Upland	4.0	
D49D	Grayclm loamy sand, 12 to 25 percent slopes	Grayclm (85%) Grayclm, nearly level (3%)	FO06A019W1 – Dry Sandy Upland	40.8	1
D53B	Loupee-Barber-Guida complex, 0 to 8 percent slopes	Meethan (5%) Wurtmth (3%) Loupee (40%) Barber (35%) Guida (20%)	FO06A019W1 – Moist Sandy Upland FO06A019W1 – Sandy Upland FO06A019W1 – Poor Fan Head Forest FO06A019W1 – Sandy Upland	5.8	
D63A	Zimmerman loamy fine sand, 0 to 2 percent slopes	Zimmerman (50%)	FO01X015W1 – Dry Upland	9.8	
D62B	Zimmerman loamy fine sand, 1 to 6 percent slopes	Zimmerman, low rices (10%) Zimmerman (100%)	FO01X015W1 – Dry Upland FO01X015W1 – Dry Upland	9.2	
D63C	Zimmerman loamy fine sand, 6 to 15 percent slopes	Zimmerman (50%)	FO01X015W1 – Dry Upland	103.2	3
D71A	Riffe, Seelyville and Loupee soils, 0 to 1 percent slopes, ponded	Riffe, ponded (34%) Loupee, ponded (32%) Seelyville, ponded (33%)	FO06A002W1 – Mucky Swamp FO06A001W1 – Poor Fan FO06A002W1 – Mucky Swamp	157.5	4
D72B	Grayclm-Wurtmth complex, 2 to 8 percent slopes	Grayclm (60%)	FO06A019W1 – Dry Sandy Upland	7.8	

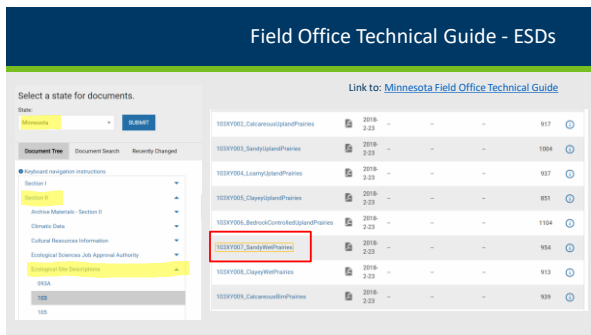
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### Ecological Site Descriptions – Web Soil Survey



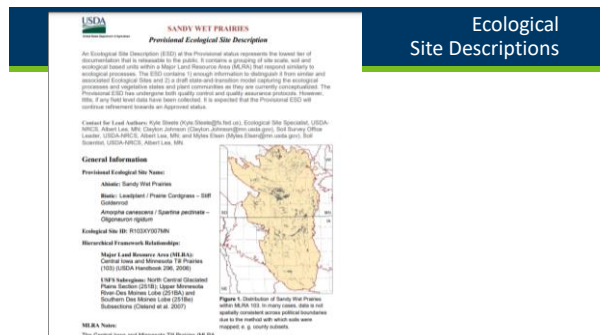
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### Field Office Technical Guide - ESDs



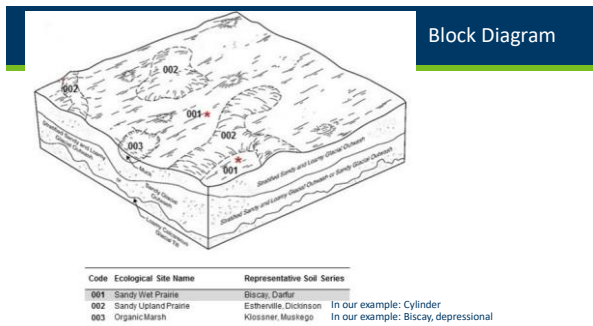
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### Ecological Site Descriptions

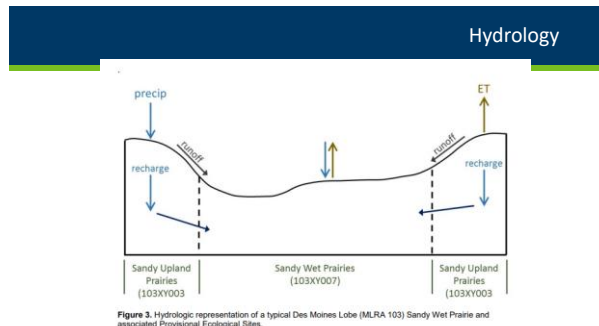


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### Ecological Site Descriptions

groups, both totaling roughly half of a typical site, respectively. For the grasses, big bluestem and Indiangrass are the most abundant. Prairie cord grass and switchgrass (*Panicum virgatum*) are important indicators of wet prairies and can sometimes be abundant. Mid-height bunchgrasses typical of drier prairies are also present and add structural diversity, such as little bluestem (*Schizachyrium scoparium*) and prairie dropseed (*Sporobolus heterolepis*). Sedges are an important component as well, and dozens of species of *Carex* are possible. However, a few species deserve specific mention. Bicknell's sedge is the most common, especially in drier conditions. Woolly sedge, Buxbaum's sedge, and rigid sedge (*Carex tetanica*) also are common. And in wetter conditions, tussock-forming species like Hayden's sedge (*Carex haydenii*) and upright sedge (*Carex stricta*) can be present. The most abundant forbs include northern bedstraw (*Galium boreale*), Virginia mountainmint (*Pycnanthemum virginianum*), Canada anemone (*Anemone canadensis*), golden zizia (*Zizia aurea*), downy phlox (*Phlox pilosa*), and Canada goldenrod (*Solidago canadensis*). In addition, a diverse assortment of charismatic prairie forbs are common to the site. Prairie blazing star is the iconic showy forb of Loamy Wet Prairies (Eggers and

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### Ecological Site Descriptions

Select a state for documents.

State:

Document Title	Type	Pub Date	Subject	Keywords
103ES Legend		2019-2-23	-	-

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### 103ES Legend

ES	ES_NAME - Number	STM Type	MN NPC	Concept
103ES	Sandy Wet Prairies 103XY007M	wet prairie	0923	Substrate: Wet to wet-mesic prairie. Poorly drained Endobasals with sandy or coarse loamy textures, derived from outwash parent materials, including loamy mantled outwash. These sites are not ponded, and are located on flat and slight depressions, primarily on outwash plains and valley trains along modern river valleys. Biscay, Darker, Grandy, Harika, Leonard, Mayer, and Tector are the dominant soil series. High organic recharge. Mineral Soil Pod.

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### Ecological Site Descriptions

#### Wet Floodplains

HOME / ESD CATALOG / MLRA 103X / ECOLOGICAL SITE 103XY007M

- Benefits**
  - Will be tied to every soil map unit in the state and full state coverage, ease of identifying via WSS
  - Best fit matches to DNR Native Plant Communities are being made
- Limitations**
  - Not fully developed, work in progress

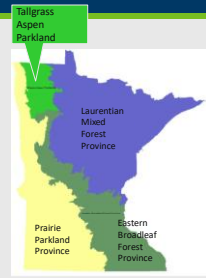
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Plant lists

- Ecological Site Descriptions
- **Native Plant Communities**

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Native Plant Communities



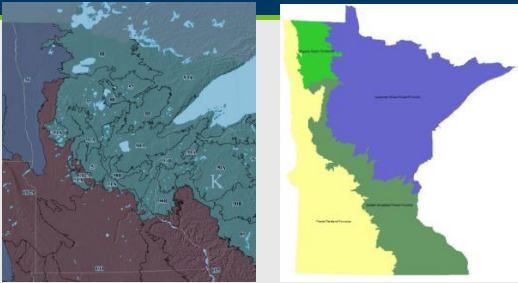
Minnesota uses a hierarchical, nested ecological land classification system.

**Provinces:** defined by major climatic zones, native vegetation and biomes

4 provinces

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Side by side



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Native Plant Communities



**Sections:** defined by glacial deposits, elevation, plant distribution and regional climate.

10 sections

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Native Plant Communities



**Subsections:** defined by glacial deposits and features, surface bedrock, local climate, topography, distribution of plants

26 Subsections

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Native Plant Communities

Example: UPs14a1

**Land Type Associations:** defined using glacial deposits and features, bedrock types, topographic roughness, lake and stream distributions, wetland patterns, depth to groundwater, soil parent material, and pre-European settlement vegetation (291 in MN).

**Upland Prairie System**

- UPn12 Northern Dry Prairie
- UPn13 Northern Dry Savanna
- UPn23 Northern Mesic Prairie
- UPn24 Northern Mesic Savanna
- UPs13 Southern Dry Prairie
- UPs14 Southern Dry Savanna
- UPs23 Southern Mesic Prairie
- UPs24 Southern Mesic Savanna

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### Native Plant Community

**WPs54b Wet Prairie (Southern)**

Wet prairies on mineral soil formed in glacial depressions where drainage is impeded but the rooting zone for most of growing season. Doi switchgrass, bluejoint, and woolly sedge. Oth Sartwell's sedge, Buxbaum's sedge, rigid sedge, marsh mummy grass, and oak green thistle. Typical forbs include great blazing star, grass-leaved goldenrod, closed gentian, swamp milkweed, spotted water hemlock, autumn sneezeweed, giant sunflower, prairie loosestrife, New England aster, and great lobelia. Shrubs cover 30% or less of the area and commonly include pussy willow, Bebb's willow, slender willow, and red-osier dogwood.

**Plant Community Planting Recommendations**

Upland Prairie	Sedge Meadow / Fresh / Wet Meadow / Wet Prairie / Shrub Swamp	Shallow Marsh	Deep Marsh	Shallow, Open Water
Common with sedge	Common with sedge	Common with sedge	Common with sedge	Common with sedge

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### Native Plant Community Resources

**System Summaries & NPC Factsheets**

- Upland Forests and Woodlands
- Wetland Forests
- Upland Grasslands, Shrublands, and Sparse Vegetation
- Wetland Grasslands, Shrublands, and Marshes

<https://www.dnr.state.mn.us/npc/index.html>

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### System Summaries & NPC Factsheets

- Upland Forests and Woodlands
- Wetland Forests
- Upland Grasslands, Shrublands, and Sparse Vegetation
- Wetland Grasslands, Shrublands, and Marshes

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### Wetland Grassland, Shrublands and Marshes

**Wet Meadow/Carr System Summaries --**

**Class Fact Sheets**

- [WmN82 Northern Wet Meadow/Carr](#)
- [WmS83 Southern Seepage Meadow/Carr](#)
- [WmS92 Southern Basin Wet Meadow/Carr](#)
- [WmP73 Prairie Wet Meadow/Carr](#)

**Figure WM-1. Floristic Regions of the Wet Meadow/Carr System**

Legend: Northern (blue), Southern (red), ECS Section (yellow)

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### Wetland Grassland, Shrublands and Marshes

**Wet Meadow/Carr System Summaries --**

**Class Fact Sheets**

- [WmN82 Northern Wet Meadow/Carr](#)
- [WmS83 Southern Seepage Meadow/Carr](#)
- [WmS92 Southern Basin Wet Meadow/Carr](#)
- [WmP73 Prairie Wet Meadow/Carr](#)

7,8,9 = increasing wetness

**Plant Community Planting Recommendations**

Upland Prairie	Sedge Meadow / Fresh / Wet Meadow / Wet Prairie / Shrub Swamp	Shallow Marsh	Deep Marsh	Shallow, Open Water
Common with sedge	Common with sedge	Common with sedge	Common with sedge	Common with sedge

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### Wetland Grassland, Shrublands and Marshes

**Marsh System Summaries --**

**Class Fact Sheets**

- [MRn83 Northern Mixed Cattail Marsh](#)
- [MRu94 Lake Superior Coastal Marsh](#)
- [MRo83 Prairie Mixed Cattail Marsh](#)
- [MRp93 Prairie Bulrush-Arrowhead Marsh](#)

8,9 = most wet on scale of 1-9

**Plant Community Planting Recommendations**

Upland Prairie	Sedge Meadow / Fresh / Wet Meadow / Wet Prairie / Shrub Swamp	Shallow Marsh	Deep Marsh	Shallow, Open Water
Common with sedge	Common with sedge	Common with sedge	Common with sedge	Common with sedge

66

# Wetland Grassland, Shrublands and Marshes

## Wet Meadow/Carr System Summaries --

LMF EBE PPA/TAP  
PDF PDF

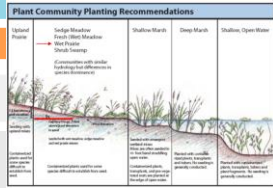
## Marsh System Summaries --

LMF EBE PPA/TAP

## Wetland Prairie System Summaries --

### Class Fact Sheets

- Wp53 Northern Wet Prairie PDF
- Wp54 Southern Wet Prairie PDF



67

# Wetland Grassland, Shrublands and Marshes

## Wetland Prairie System Summaries --

EBE PPA/TAP  
PDF PDF

### Class Fact Sheets

- Wp53 Northern Wet Prairie PDF
- Wp54 Southern Wet Prairie PDF

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## Wp54 Southern Wet Prairie

Grass-dominated but herb-rich herbaceous communities on poorly drained to very poorly drained basin soils formed in lacustrine sandstones, unconsolidated pebbles or fine to medium-grained igneous. Typically a slight depression, dominantly on very gentle slopes. Flooded for brief periods at most; upper part of rooting zone is not saturated for most of growing season, but saturation usually persists in lower zone for much of season.

**Vegetation Structure & Composition**

Openness based on number of vegetation sites (17 sites).

**Characteristics:** Cover is usually continuous (100% cover), but some midheight and low grasses and sedges are also important. Prairie cordgrass (*Cynodon pectinatus*) and big bluestem (*Andropogon gerardii*) are the dominant tallgrass prairie grasses (*Sorghastrum nutans* and *Tripsacum dactyloides* are frequently present). Many species in the western part of the state. Windy sedge (*Carex pedunculata*) is an important component, and rigid sedge (*C. lasiocarpa*) and *Helianthus scaberrimus* (*Helianthus*) are frequently present. The multi-grass (*Andropogon gerardii*) community is frequently present. The multi-grass (*Andropogon gerardii*) community is frequently present. The multi-grass (*Andropogon gerardii*) community is frequently present.

**Soil:** *Stipa sp.* is absent to sparse (<25% cover). The low stem shrub prairie soil (*Stipa sp.*) is absent to sparse (<25% cover). The low stem shrub prairie soil (*Stipa sp.*) is absent to sparse (<25% cover).

69

## Wp54 Southern Wet Prairie

**Wp54 Southern Mosaic Prairie**

LP23 grades into Wp54 at the moist end of the moisture gradient in LP23, without a distinct floristic boundary between the two classes. LP23 typically occurs on drier sites, on particularly convex sites or slopes, but topographic differences between the classes are not always apparent. Big bluestem and prairie dogwood (*Xylocopa herbicola*) are more important in LP23 than in Wp54. Conversely, flame congress and red mucky grass are much less important in LP23 than Wp54. Sedges (*Carex* spp.) are only a minor component of LP23 but important in Wp54.

Wp54 Indicator Species	Wp54	LP23 Indicator Species	LP23
Big bluestem ( <i>Andropogon gerardii</i> )	40	Big bluestem ( <i>Andropogon gerardii</i> )	40
Prairie cordgrass ( <i>Cynodon pectinatus</i> )	30	Prairie cordgrass ( <i>Cynodon pectinatus</i> )	30
Stipa sp.	20	Stipa sp.	20
...	...	...	...

**Wp54 Southern Basin Wet Meadow/Carr**

Wp54 and Wp52 occur in similar landscape settings, but soils in Wp54 are only briefly saturated in late spring, while soils in Wp52 are saturated throughout summer. As a result, Wp52 is more likely to have wetland species tolerant of long periods of inundation or saturated soils. Wp52 is usually strongly dominated by sedge (*Carex* spp.) and occasionally by lake sedge (*Carex lasiocarpa*), whereas *Scleria holosericea* is typically codominant or an important subdominant with sedge (*Carex* spp.) in Wp54. Prairie cordgrass may be present in Wp52 but is much less common than in Wp54. The other typical prairie grasses of Wp54 are very rare in Wp52.

Wp54 Indicator Species	Wp54	Wp52 Indicator Species	Wp52
Stipa sp.	40	Stipa sp.	40
...	...	...	...

70

### Wp54 Southern Wet Prairie - Species Frequency & Cover

Species Name & Form Abies	freq	cover
Canada goose ( <i>Branta canadensis</i> )	78	22
Red-winged blackbird ( <i>Agelaius phoeniceus</i> )	60	22
...	...	...

71

### Wp54 Southern Wet Prairie - Species Frequency & Cover

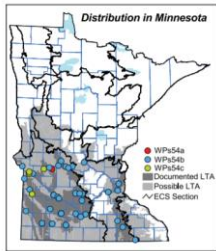
Species Name & Form Abies	freq	cover
Canada goose ( <i>Branta canadensis</i> )	78	22
Red-winged blackbird ( <i>Agelaius phoeniceus</i> )	60	22
...	...	...

**Key to species cover rank.**

cover class	freq
>50%	****
25-50%	***
10-25%	**
5-10%	*
<5%	•

72

## Native Plant Communities



- Benefits**
  - Supported by native vegetation research
  - Thorough species lists and species cover ranks
  - Insight into associated plant communities
- Limitations**
  - Not all species are available for restoration seed mixes
  - Harder to match native plant community to your site once site is disturbed
  - Need to be proficient at using guides to identify sites

73

USDA Minnesota Agronomy Technical Note # 31  
*Herbaceous Vegetation Establishment Guide*  
LINK

MN BOARD OF WATER AND SOIL RESOURCES  
Wetland Restoration for Mitigation  
LINK

MN BOARD OF WATER AND SOIL RESOURCES  
Wetland Restoration  
LINK

Wetland Restoration Guidance:  

- Minnesota Wetland Restoration Guide
- Technical Guidance Documents
- MN Wetland Restoration Plant ID Guide (pdf)

## Other resources

74

### Seed mix information

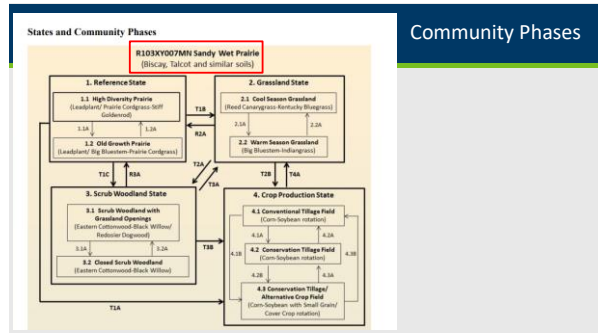
LINK

Title	Label	Seed mix category	Seed mix purpose	Seed mix region	Wetland Downloaded Link
State Matrix	34.193	Current State Seed Mix	Wetland	Statewide	Minnesota Seed (PDF)
West Headwaters	34.172	Current State Seed Mix	Wetland	Northwest	Minnesota Seed (PDF)
West Headwaters Park Ridge High South & West	34.274	Current State Seed Mix	Wetland	South & West	Minnesota Seed (PDF)
Wetland South & West	34.252	Current State Seed Mix	Wetland	South & West	Minnesota Seed (PDF)
Wetland South & West	34.172	Current State Seed Mix	Wetland	Statewide	Minnesota Seed (PDF)
Wetland NE	34.162	Current State Seed Mix	Wetland	Northwest	Minnesota Seed (PDF)
West Prairie	34.163	Current State Seed Mix	Wetland	South & West	Minnesota Seed (PDF)
Emergent Wetland	34.132	Current State Seed Mix	Wetland	Statewide	Minnesota Seed (PDF)
Wetland South & West	34.271	Current State Seed Mix	Wetland	South & West	Minnesota Seed (PDF)
Wetland South & West High Productivity	34.276	High Seed Mix	Wetland	South & West	Minnesota Seed (PDF)
Emergent Wetland High Productivity	34.164	High Seed Mix	Wetland	Statewide	Minnesota Seed (PDF)



### Seed mixes

75



76

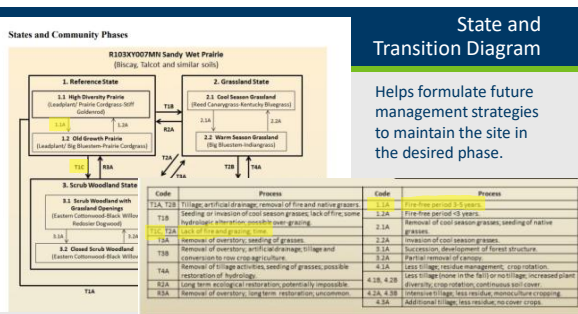
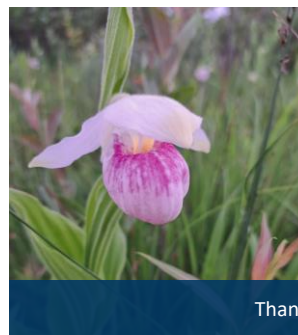


Figure 4. State-and-transition diagram for Sandy Wet Prairies Provisional Ecological Site.

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### Contact info:

Kelly Voigt  
Northern Regional Training Conservatorist  
Technical Training and Certification Program

[Kelly.Voigt@state.mn.us](mailto:Kelly.Voigt@state.mn.us)

218-850-0208

Thank you!

78

## Regulatory Implications of wetland plant communities

- Classified per Eggers & Reed and Circular 39
- Classification relates to plant community
- Many exemptions are based on wetland type
- Regulations more restrictive for certain wetland types
- Scope of WCA for calcareous fens
- Actions Eligible for Mitigation Credit



79

## When wetland type is a factor in WCA:

- Definition of Impact
- Exemptions:
  - Agricultural Activities
  - Drainage
  - De minimis
  - Wildlife Habitat
- Wetland Banking
  - Credit Areas
  - Performance standards
- Also could come into play:
  - Special considerations
  - Water planning
  - Local Ordinances

80

Circular 39	Eggers & Reed
1	Seasonally Flooded Basins
1	Floodplain Forests
2	Sedge Meadows
2	Fresh (wet) Meadows
2	Wet to Wet-Mesic Prairies
2	Calcareous Fens
3	Shallow Marsh
4	Deep Marsh
5	Shallow, Open Water
6	Shrub-Carr
6	Alder Thicket
7	Hardwood Swamp
7	Coniferous Swamp
8	Open Bog
8	Coniferous Bog

81

Crosswalk Table and Regulatory Implications		
Circular 39	Eggers & Reed	Regulatory Implications
1	Seasonally Flooded Basin	Eligible for Ag exemption A & B*
1	Floodplain Forest	Eligible for drainage exemption C2*
2	Fresh wet meadow	Not eligible for Ag exemption B Restoration/protection action eligible for credit (ENRV)*
2	Sedge meadow	Eligible for drainage exemption C2*
2	Wet/wet-mesic prairie	Eligible for drainage exemption C2*
2	Calcareous fens	Outside scope of WCA. No exemptions apply Restoration/protection action eligible for credit (ENRV)*
3	Shallow marsh	Excavation regulated. Reduced de minimis Not eligible for public drainage exemption Limits to habitat exemption projects
4	Deep marsh	Excavation regulated. Reduced de minimis Limits to habitat exemption projects Not eligible for public drainage exemption
5	Shallow, open water	Excavation regulated. Reduced de minimis Limits to habitat exemption projects Not eligible for public drainage exemption
6	Shrub-Carr/Alder Thicket	Eligible for drainage exemption C2*
7	Hardwood/Coniferous Swamp	Reduced de minimis Restoration/protection of white cedar swamp an action eligible for credit (ENRV)*
8	Open/coniferous bog	Reduced de minimis

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## What is regulated by WCA?

### What is considered Impact?

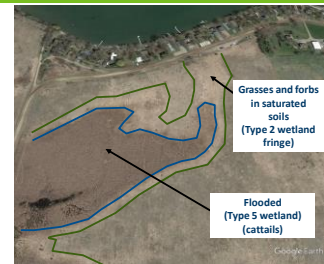
A loss in quantity, quality, or biological diversity of a wetland **caused by draining** or **filling** in all types or by **excavation** in types 3, 4, or 5.



83

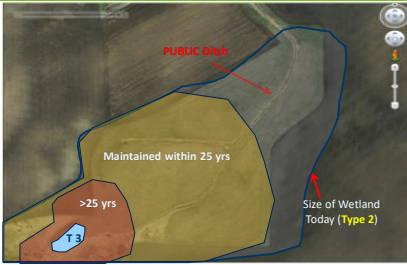
## Wetland Impacts - Excavation

- **Regulated** - Excavation in permanently and semi-permanently flooded areas of Type 3, 4 or 5 wetlands
- **Not Regulated** – All other wetland types (unless excavation is too deep or spoil is put in wetland)
- Tip: BWSR WCA Topic of the Week – Excavation in Wetlands



84

### Private VS. Public Drainage Ditch Maintenance Illustration



85

### Wetland Type for de minimis

Circular 39 Classification system  
- Based on hydrology and vegetation

Two groups of wetland types for de minimis:  
- Types 1,2,6&7  
- Types 3,4,5&8

Table 1: Base de minimis exemption amounts for all of Minnesota

Wetland Type	Exemption Amount	Notes
Types 1, 2, 6, 7 (including white cedar and tamarack wetland and any Type 7 wetland in a 0.8% metro county)	20,000 ft <sup>2</sup> in all > 80th counties 5,000 ft <sup>2</sup> in non-metro 50-80th counties 2,500 ft <sup>2</sup> in metro 50-80th counties 2,000 ft <sup>2</sup> in non-metro < 50th counties	
Types 3, 4, 5, 8, and white cedar and tamarack wetland (including any Type 7 wetland in a < 0.8% metro county)	1,000 ft <sup>2</sup>	
Types 1, 2, 6, 7	400 ft <sup>2</sup> *(\$1,000 ft <sup>2</sup> )	
Types 3, 4, 5, 8, and white cedar and tamarack wetland	100 ft <sup>2</sup>	
All wetland types	30 ft <sup>2</sup> *(\$100 ft <sup>2</sup> )	

\*Increased amounts shown in parenthesis may be allowed if wetland is isolated from the public water, or if permanent water control structures or stabilization measures are established in proximity to the impact and approved by the shoreland management authority.

86

### What is a tamarack or white cedar wetland?

- Either of species is a dominant species using the dominance test (50/20 Rule)
- If no delineation has been conducted, TEP should make findings demonstrating dominance using the 50/20 rule prior to making a de minimis determination



Species	Count	Area (ft <sup>2</sup> )	Percentage
White Cedar	15	1500	75%
Tamarack	10	1000	50%
Other Species	...	...	...

Handwritten notes: "50/20 Rule: 50% of area is White Cedar, 20% of area is Tamarack. This is a tamarack or white cedar wetland." "50/20 Rule: 50% of area is White Cedar, 20% of area is Tamarack. This is a tamarack or white cedar wetland." "50/20 Rule: 50% of area is White Cedar, 20% of area is Tamarack. This is a tamarack or white cedar wetland."

87

Circular 39	Eggers & Reed	Regulatory Implications
1	Seasonally Flooded Basin	Eligible for Ag exemption A & B* Eligible for drainage exemption C2*
1	Floodplain Forest	Not eligible for Ag exemption B Restoration/protection an action eligible for credit (ENR/V)*
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2	Sedge meadow	Eligible for drainage exemption C2*
2	Wet/mesic prairie	Eligible for drainage exemption C2*
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5	Shallow, open water	Excavation regulated Reduced de minimis Limits to habitat exemption projects Not eligible for public drainage exemption
6	Shrub-Cow/Alder thicket	Eligible for drainage exemption C2*
7	Hardwood/Coniferous Swamp	Reduced de minimis Restoration/protection of white cedar swamp an action eligible for credit (ENR/V)*
8	Open/Coniferous bog	Reduced de minimis Conditions required

88

### FORBS: FAMILIES AND IDENTIFICATION



89

### Forb definition


A forb is a broad-leaved, non-woody flowering plant with around 148 families



90

### Common Families:


- o Mint (Lamiaceae)
- o Aster (Asteraceae)
- o Vervain (Verbenaceae)
- o Milkweed (Apocynaceae)
- o Smartweed (Polygonaceae)
- o Loosestrife (Lythraceae)
- o Burreed (Sparganiaceae)
- o Cattail (Typhaceae)
- o Water Plantain (Alismaceae)
- o Iris (Iridaceae)
- o Legume (Fabaceae)
- o Carrot (Apiaceae)



91

### Mint Family- Lamiaceae


- 4-angled square stem typically
- Often aromatic
- Flowers in leaf axils, or heads or spikes at end of stem
- Leaves simple, opposite, sharply toothed or lobed



92

### Bugleweed *Lycopus americanus*

- Small 4-lobed white flowers in axils
- Similar to field mint, but not strongly scented

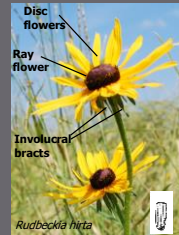


NCNE	MW	GP
OBL	OBL	OBL

93

### Aster Family- Asteraceae


- Flowers of two types, ray and disc flowers
- Head surrounded by an involucre bract
- Fruit is an achene



94

### Giant Goldenrod *Solidago gigantea*

- Alternate, 3-veined leaves
- Wet sites




NCNE	MW	GP
FACW	FACW	FAC

95

### Canada Goldenrod *Solidago canadensis*

- Stem hairy [top part esp.]
- Alternate leaves
- 3-veined
- Upland and transition areas




NCNE	MW	GP
FACU	FACU	FACU

96




### Goldenrods



Disc flowers  
Ray flower

stem texture

3 main veins




NCNE	MW	GP
FACW	FACW	FAC

97

### Cup-plant *Silphium perfoliatum*

- Squarish stem
- Not a mint!
- Rough leaf surface




NCNE	MW	GP
FACW	FACW	FAC

Leaves appear perforated by stem, forming a cup

98

### Sneezeweed *Helenium autumnale*

- Yellow flowers with three teeth at the end of each ray
- Winged stem



Winged Stem

Three teeth


Ray flower

NCNE	MW	GP
FACU	FACU	FACU

99

### Sawtooth Sunflower *Helianthus grosseserratus*

- Stems smooth with sparse hairs
- Drooping leaves, both sides rough
- Pale leaf underside covered with short hairs




NCNE	MW	GP
FACW	FACW	FACW

Bill Summers © USDA, NIKS PLANTS Database

100

### Boneset *Eupatorium perfoliatum*

- Coarsely toothed leaf
- Perfoliate
- Hairy stem




Leaves joined into one

NCNE	MW	GP
FACW	OBL	FACW

101

### Vervain Family- Verbenaceae


- 4-angled square stem
- Opposite, toothed leaves
- Flowers in spikes or groups at end of stem




102

### Vervain

Blue Vervain  
*Verbena hastata*  
FACW



Hoary Vervain  
*Verbena stricta*  
UPL




Fewer stouter spikes →

→ Rounder Leaves

103

### Milkweed Family- Apocynaceae

- Leaves opposite
- Milky juice in stem
- Flowers numerous in umbels at end of stem




104

### Common Milkweed *Asclepias syriaca*

- Wide opposite leaves
- Milky sap

NCNE	MW	GP
UPL	FACU	UPL




105

### Swamp Milkweed *Asclepias incarnata*

- Tapering narrow leaves
- Milky sap (less than other species)
- Wet sites

NCNE	MW	GP
OBL	OBL	FACW




← Tapering narrow leaf

106

### Smartweed Family- Polygonaceae


- Alternate, simple leaves, Stipules joined forming a sheath (Ocrea) around stem at nodes
- Petals absent, sepals petal-like




107

### Smartweeds

Pennsylvania Smartweed  
*[Persicaria pensylvanicum]*  
FACW



Water Smartweed  
*[Persicaria amphibium]*  
OBL



Both at wet sites

← Thumbprint on leaf

108

### Loosestrife Family Lythraceae

- Upper stems multi-sided, square
- Leaves opposite and stalk-less
- Flowers have 6 petals



109

### Purple Loosestrife *Lythrum salicaria*

- MN Noxious weed
- Woody square stem
- Leaves lanceolate, opposite or whorled
- Spikes of purple-red flowers

NCNE	MW	GP
OBL	OBL	OBL



110

### Burreed Family Sparganiaceae

- Stems erect, unbranched, round in cross section
- Leaves long and linear
- Flowers crowded in round heads with male and female flowers separate



111



112

### Cattail Family Typhaceae

- Leaves near base, in two ranks, long and strap-like
- Flowers are tiny, in large groupings, male and female portions of spike are separate
- Female flowers on bottom, male flowers on top
- Reproduce by submerged rhizome, creating mats



<http://botany.cofl.tamu.edu/FLORA/gallery.htm>

113

### Broadleaf Cattail *Typha latifolia*

- Broad leaves usually don't extend past spike
- Upper staminate and lower pistillate portions of the spike are continuous

NCNE	MW	GP
OBL	OBL	OBL



114

### Narrowleaf and Hybrid Cattail

*Typha angustifolia* and *Typha X glauca*

- Narrow Leaves extend beyond spike
- Staminate and pistillate portions of spike separate, with gap

NCNE	MW	GP
OBL	OBL	OBL

Gap in spike

115

### Water Plantain Family- Alismaceae

- Stout rhizomes
- Leaves from base of plant, clasping stem
- Multi-branched inflorescence
- Flowers with 3 petals

116

### Water Plantain

*Alisma subcordatum*

- Leaves elliptical or egg shaped on long stalks
- White or pinkish flowers about 1/8" wide
- Found along muddy shores

NCNE	MW	GP
OBL	OBL	OBL

117

### Broad Leaf Arrowhead

*Sagittaria latifolia*

- Flowers grow in whorls of 3 from an un-branched stalk
- Leaf shaped like an arrow head

NCNE	MW	GP
OBL	OBL	OBL

118

### Iris Family- Iridaceae

- Parallel veined, 2 ranked leaves
- Flowers with 6-petals

IRIS FLOWER PARTS

- 3 petals
- 3 petal-like sepals
- 3 sepals
- bearded seed capsule

119

### Harlequin Blue Flag Iris

*Iris versicolor*


- Deep purple base
- Blue flower with large yellow center
- Found in the North

NCNE	MW	GP
OBL	OBL	OBL

120

### Virginia Iris *Iris virginica*

- Green base
- Purple flower with small yellow center
- Found in the south

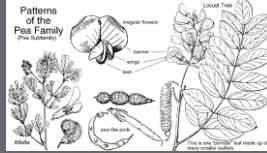


NCNE	MW	GP
OBL	OBL	OBL

121

### Legume Family- Fabaceae


- Alternate leaves, pinnately divided
- Flowers irregular, 5 lobed and in racemes



122

### Sweet Clover *Melilotus officinalis*

- Flowers can be yellow or white
- Leaves divided into 3 leaflets
- Non-native




NCNE	MW	GP
FACU	FACU	FACU

123

### Carrot (or parsley) Family- Apiaceae


- Hollow stem
- Alternate or basal leaves, mostly compound
- Flowers in flat-topped umbels; 5 petals



124

### Wild Parsnip *Pastinaca sativa*

- Contact with the plant can cause a sun-induced rash
- Compound umbel of yellow flowers
- Pinnately lobed leaves
- Tall growth habit.



NCNE	MW	GP
UPL	UPL	UPL

125

### Wild Parsnip      Golden Alexanders



USDA/NRCS PLANTS Database | Britton, A.L., and A. Brown. 1913. An Illustrated Flora of the Northern United States, Canada and Great Britain. 2nd Edition. New York: McGraw-Hill. 1176 pp.

USDA/NRCS PLANTS Database | Britton, A.L., and A. Brown. 1913. An Illustrated Flora of the Northern United States, Canada and Great Britain. 2nd Edition. New York: McGraw-Hill. 1176 pp.

126

### What family is this plant from?

- Mint (Lamiaceae)
- Aster (Asteraceae)
- Vervain (Verbenaceae)
- Milkweed (Apocynaceae)
- Smartweed (Polygonaceae)
- Loosestrife (Lythraceae)
- Burreed (Sparganiaceae)
- Cattail (Typhaceae)
- Water Plantain (Alismaceae)
- Iris (Iridaceae)
- Legume (Fabaceae)
- Carrot (Apiaceae)

127

### DO NOT TOUCH!

Wild Parsnip



Water Hemlock



Poison Ivy



Poison Sumac



Nettles



128



Plant ID: Grasses-Sedges-Rushes

Carol Strojny



129

### Grass like plants



130

### Grass like plants

**Grasses**



**Sedge Family**



**Rushes**



Source: Minnesota Wildflowers



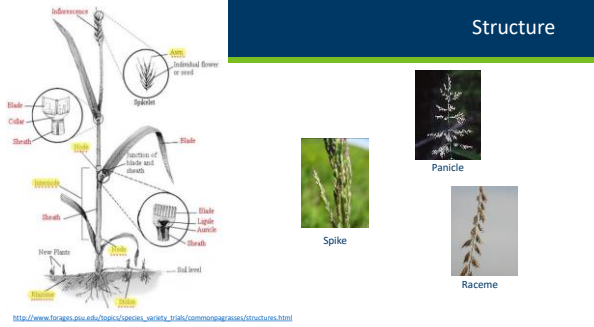
131



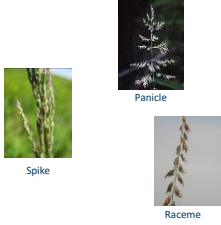
### Grasses



132



Structure



133

Bluegrasses (*Poa spp.*)

- Cool season grasses
- Narrow leaves
- Boat shaped leaf tips
- Multiple flowers per spikelet



134

Kentucky Bluegrass (*Poa pratensis*)      Fowl Bluegrass (*Poa palustris*)



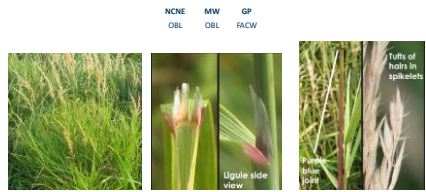
135

Redtop (*Agrostis gigantea*)



136

Canada bluejoint (*Calamagrostis canadensis*)



137

Prairie Cordgrass (*Spartina pectinata*)



138

### Big bluestem (*Andropogon gerardii*)



139

### Switchgrass (*Panicum virgatum*)



140

male

3-ranked leaves

female

closed sheath

Scale

mi DEPARTMENT OF TRANSPORTATION

### Sedge Family

142

### True Sedges (*Carex* sp.)

Source: Minnesota Wildflowers

143

### True Sedges (*Carex* sp.)

Perigynium

Scale

- Triangular stems
- Flower heads variable
- Each achene enclosed in a sac
- Scales present

144

### Common Obligate Wetland Carex

Lake Sedge  
*Carex lacustris*

Slough Sedge  
*Carex atherodes*

Common Beaked Sedge  
*Carex utriculata*

Ford Sedge

M-shaped leaf blades

Hairy Sedge

145



Common Wetland Carex

Awl fruited Sedge  
*Carex stipata*  
(OBL)



Tussuck Sedge  
*Carex stricta*  
(OBL)



Fox sedge  
*Carex vulpinoidea*



146

*Carex pensylvanica* (Upland)



147

Sedge Family: Flat Sedges

Yellow Nutsedge (*Cyperus esculentus*) FACW

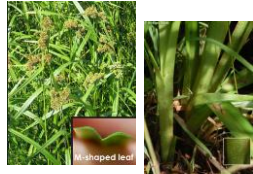
- Perennial (not native to MN)
- Leaves light green
- Spikelets are bright yellow, perpendicular to the stem
- Each spike is 5-8 cm long



148

Sedge Family: Bulrushes

Green Bulrush  
*Scirpus atrovirens*  
(OBL)



Woolgrass  
*Scirpus cyperinus*  
(OBL)



149

Sedge Family: Bulrushes

River Bulrush  
*Bolboschoenus fluviatilis*  
(OBL)



Softstem Bulrush  
*Schoenoplectus tabernaemontani*  
(OBL)



150

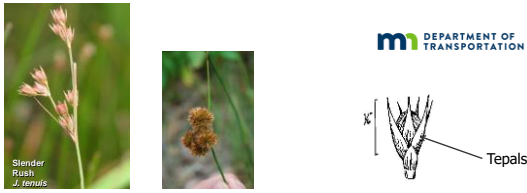
Sedge Family: Spikerushes



- Rounded or flattened solid/spongy stem
- Leaves reduced to sheaths
- Terminal spikelet



151



Rushes

152

Juncus – True Rushes

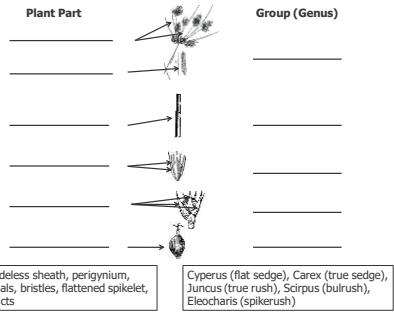


- Rounded or flattened stem
- Leaves few, round or flattened
- Sheaths open, often with auricles
- Flowers with 6 tepals
- Capsules with many seeds

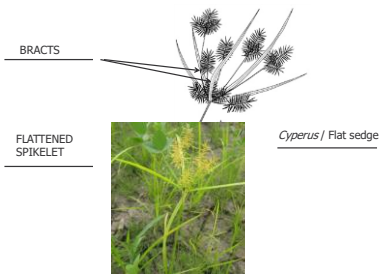
153

Review: Sedges and Rushes

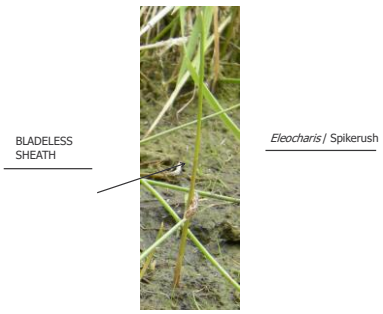
154



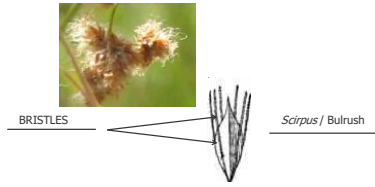
155



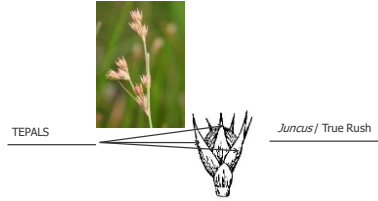
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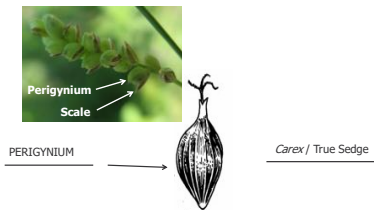
157



158



159



160



Thank You!

Carol Strojny  
carol.strojny@state.mn.us

161



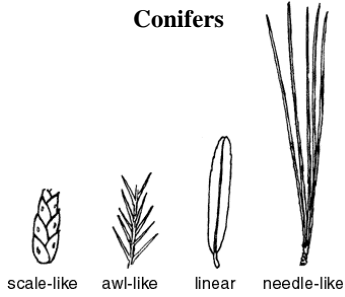
162

Conifers & Broadleaf

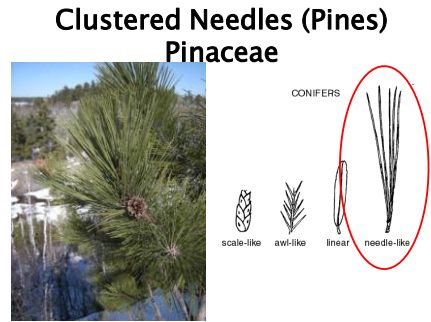
- **Conifers** – a tree that bears cones and evergreen needlelike leaves
- **Broadleaf** – a tree that bears wide flat leaves that are shed annually



163



164



165



166

**Tamarack *Larix laricina***

NCNE	MW	GP
FACW	FACW	FACW

- Deciduous
- Needles are bunched, 10-35/tuft, or singly on new shoots
- Needles 1/2 to 1"
- Male & female cones on the same tree (monoecious)
- Common to swamps and bogs

167

**Eastern White Pine**

*Pinus strobus*

NCNE	MW	GP
FACU	FACU	FACU

- 5 Needles per bunch
- Needles 2.5 to 5"
- Soft flexible needles

168

**Red Pine**

*Pinus resinosa*

NCNE	MW	GP
FACU	FACU	FACU

- 2 Needles per bunch
- Needles 4 to 7"
- Needles break cleanly when bent

169

**Jack Pine** *Pinus banksiana*

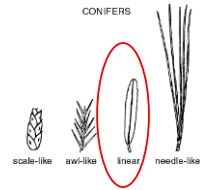
NCNE	MW	GP
FACU	FACU	FACU

- 2 needles per bunch
- Needles ¼ to 2"
- Adapted for fire
- Serotinous cones
- Germinate best on mineral soil



170

**Single Needles**  
(Fir, Spruce, Hemlock – still Pinaceae)



171

**Balsam fir**

*Abies balsamea*

NCNE	MW	GP
FAC	FACW	FAC

- Needles continuous along stem and branches
- Needles 3/8 to 1" and flat
- Female seed cones are purple w/ lots of resin



172

**White Spruce**

*Picea glauca*

NCNE	MW	GP
FACU	FACU	FACU

- Short blue green needles
- Needles are born singly
- 1/3 to ¾" long
- Needles 4 sided
- Branches slightly droop

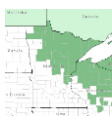


173

**Black Spruce** *Picea mariana*

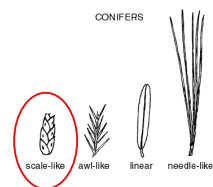
NCNE	MW	GP
FACW	FACW	FACW

- Branches short and drooping
- ¼ to ½" long
- 4 angled or squarish in cross section
- Dark (blackish) foliage
- Small, egg shaped cones



174

**Scale-like Needles**  
(White Cedar)



175

**Northern White Cedar**

*Thuja occidentalis*

NCNE	MW	GP
FACW	FACW	FACW

- Spicy fragrance when crushed
- Leaves scalelike
- 1/10 (or less) to 1/4" long
- Bright green through the first winter then turn brown and woody and persist for several years.



176



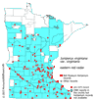
177

**Eastern Red Cedar**

*Juniperus virginiana*

NCNE	MW	GP
FACU	FACU	UPL

- 2 types of leaves, juvenile & mature
- Early season foliage: green  
Late summer/winter: dark bronzy red



178

**Broadleaf Trees**



179

**OPPOSITE BRANCHING**



180

**Maple (Aceraceae)**



Red maple  
(*Acer rubrum*)



Sugar maple  
(*Acer sacharum*)



Silver maple  
(*Acer sacharinum*)



NCNE	MW	GP
FAC	FAC	FAC

NCNE	MW	GP
FACU	FACU	UPL


NCNE	MW	GP
FACW	FACW	FAC

181

**Box Elder (Maple)**


*Acer negundo*

NCNE	MW	GP
FAC	FAC	FAC




*Acer negundo* 3 leaves from the same tree

Michael Clarys - EW-Madison




182

**Ash (Oleaceae)**





183



**Black Ash**  
*(Fraxinus nigra)*


NCNE	MW	GP
FACW	FACW	FACW






**Green Ash**  
*(Fraxinus pennsylvanica)*

NCNE	MW	GP
FACW	FACW	FAC




184


Stalk (petiolules) on leaflets



**White ash**  
*Fraxinus americana*



**Black ash**  
*Fraxinus nigra*



**Green ash**  
*Fraxinus pennsylvanica*

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**Long-5-10 mm**

**None**

**Short-1-4mm**

185

**Dogwoods (Cornaceae)**



186

**Red-osier dogwood**

*Cornus sericea*

NCNE	MW	GP
FACW	FACW	FACW



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187

**Gray Dogwood**

*Cornus racemosa*

NCNE	MW	GP
FAC	FAC	FAC

- Dull, gray twigs (brown first year)
- Opposite leaves
- White/pale blue berries on bright red pedicels



188

**Silky Dogwood**

*Cornus amomum*  
Aka *Cornus obliqua*

NCNE	MW	GP
FACW	FACW	FACW

- Magenta twigs
- Opposite leaves
- Dark blue berries



189

**Dogwoods**

Left: **Red-Osier Dogwood** – bright red twigs, white pith, white berries

Middle: **Gray Dogwood** – gray twigs, brown pith, white berries

Right: **Silky Dogwood** – magenta twigs, brown pith, dark blue berries



190

**Viburnum (Moschatel)**



191

**Nannyberry**

*Viburnum lentago*

NCNE	MW	GP
FAC	FAC	FACU



192

**Highbush Cranberry**

*Viburnum opulus*

NCNE	MW	GP
FACW	FAC	FAC



193



**ALTERNATE BRANCHING**



194

**Birches (Betulaceae)**



195

**Yellow Birch**

*(Betula alleghaniensis)*

NCNE	MW	GP
FAC	FAC	FACU



196

**Paper Birch**

*(Betula papyrifera)*

NCNE	MW	GP
FACU	FACU	FACU



197

**Bog Birch**

*(Betula pumila)*

NCNE	MW	GP
OBL	OBL	OBL

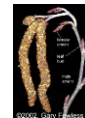


198

**Speckled Alder**


*(Alnus incana)*

NCNE	MW	GP
FACW	FACW	FACW




199


**Oaks (Fagaceae)**



**N. Red Oak**  
*(Quercus rubra)*


NCNE	MW	GP
FACU	FACU	FACU






**N. Pin Oak**  
*(Q. ellipsoidalis)*


NCNE	MW	GP
UPL	UPL	UPL





**Bur Oak**  
*(Q. macrocarpa)*

NCNE	MW	GP
FACU	FAC	FACU



200

**Elms (Ulmaceae)**

**American Elm**

*(Ulmus americana)*

NCNE	MW	GP
FACW	FACW	FAC






201

**Northern Hackberry**

*(Celtis occidentalis)*


NCNE	MW	GP
FAC	FAC	FACU







202


**Poplars (Salicaceae)**



**Balsam Poplar**  
*(Populus balsamifera)*


NCNE	MW	GP
FACU	FACW	FACW






**Bigtooth Aspen**  
*(P. grandidentata)*

NCNE	MW	GP
TACU	TACU	TACU





**Trembling Aspen**  
*(P. tremuloides)*

NCNE	MW	GP
TACU	TAC	TAC



203

**Cottonwood**

*(Populus deltoides)*

NCNE	MW	GP
FAC	FAC	FAC

- Opposite leaves (CAP), compound
- Small, purple-black berries
- Twigs brittle due to large pith





204

**Willows (Salicaceae)**

*(Salix spp.)*

18 species native in Minnesota, 3 species naturalized

- Leaf width vs. length
- Upper and lower surface texture, color
- Leaf edges
- Stipules may be present



205

**Gooseberries or Currants (Grossulariaceae)**

(*Ribes spp.*)

9 species native in Minnesota

- Currants lack spines and bristles (1 exception), jointed stalk
- Gooseberries have spines and bristles, berry stalk not jointed



206

**The Rose Family (Rosaceae)**

**Blackberry & Raspberry**

(*Rubus spp.*)

The largest genus of woody plants in Minnesota (33 native, 2 hybrids)

- If present, prickle or bristle shape
- Leaf structure
- Cane growth pattern (both from 1<sup>st</sup> year and 2<sup>nd</sup> year canes)



207

**Red Raspberry**

(*Rubus idaeus ssp. strigosus*)

NCNE	MW	GP
FACU	FACU	FACU



208

**Steeplebush**

(*Spiraea tomentosa*)

NCNE	MW	GP
FACW	FACW	FACW

- Leaves alternate
- White to orange woolly undersides



209

**Meadowsweet**

(*Spiraea alba*)

NCNE	MW	GP
FACW	FACW	FACW

- Alternate leaves
- Leaves not woolly



210

**Buckthorn Family (Rhamnaceae)**

**Glossy Buckthorn**

(*Frangula alnus*)

NCNE	MW	GP
FAC	FACW	FAC

- Leaf margins entire (not toothed)



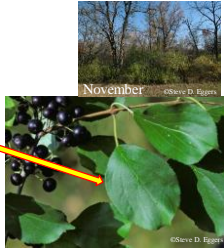
211

**Common Buckthorn**

*(Rhamnus cathartica)*

NCNE	MW	GP
FAC	FAC	FACU

- Leaf margins with fine teeth



212

**WOODY VINES**

213

**Grape Family (Vitaceae)**

Virginia Creeper  
*(Parthenocissus quinquefolia)*



NCNE	MW	GP
FACU	FACU	FACU

Woodbine  
*(Parthenocissus inserta)*



NCNE	MW	GP
FACU	FACU	FAC

214

Summer Grape  
*(Vitis aestivalis)*



NCNE	MW	GP
FACU	FACU	FAC

River-bank Grape  
*(Vitis riparia)*



NCNE	MW	GP
FACU	FACW	FAC

215

**Menispermaceae Family**



Moonseed  
*(Menispermum canadense)*



NCNE	MW	GP
FAC	FAC	FACU

216