



1

2026 MWPCP Training Courses

MWPCP Courses

- Hydrogeomorphic Method of Classifying Wetlands -Baxter- April 23 & 24
- Hydrogeomorphic Method of Classifying Wetlands-Rochester- April 28 & 29
- Soils on the Landscape- North Branch- May 20 & 21
- Plant ID & Rapid FQA- Cloquet & Lino Lakes- July 7 & 21
- Functional Assessment Method - Shoreview -Oct 13 & 14
- WCA Rule virtual training- November 18
- New Normal?: Emerging Topics in the Wetland World –Metro- December 8



2

2026 MWPCP Training Courses

Introduction to Wetland Delineation and Regulations

- Introduction to Wetland Delineation and Regulations: MNDOT Training Center, Shoreview, MN- June 8-12
- Introduction to Wetland Delineation and Regulations: Cloquet Forestry Center, Cloquet – August 31-September 4
- Introduction to Wetland Delineation and Regulations: Northland Arboretum, Baxter, MN - September 14-18

Professional Exams

MWPCP Exams will be offered at 1pm on: June 12 in Shoreview, September 4 in Cloquet & September 18 in Baxter



3



Wetland Plant ID & FQA Agenda

- Plant ID concepts
- Common species: grasses, sedges, rushes
- Plant ID Stations
- Intro to FQA Concepts & Methods
- Small Group Field Exercise
- Data Input, Interpretation and Discussion

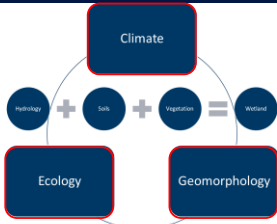
Class Portal: <https://bwsr.state.mn.us/node/4681>



4

Zoom out to Zoom In

- Overarching factors that determine much of the condition of an area
- Examples:
 - Geomorphology determines landscapes and soil parent material
 - Climate determines antecedent precipitation
 - Ecology determines dominate plant communities



5

Native Plant Community Resources

System Summaries & NPC Factsheets

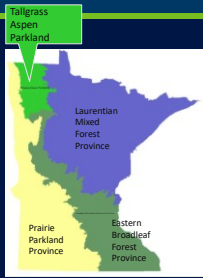
- Upland Forests and Woodlands
- Wetland Forests
- Upland Grasslands, Shrublands, and Sparse Vegetation
- Wetland Grasslands, Shrublands, and Marshes

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



6

Native Plant Communities



Minnesota uses a hierarchical, nested ecological land classification system

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

4 provinces

7

Laurentian Mixed Forest Province

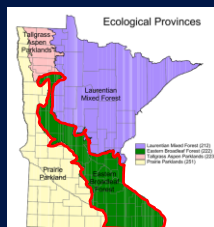
- Covers MN, WI, MI, southern Ontario and parts of New England
- In MN covers 23 million acres
- Mixed conifer and hardwood forests
- Varies from thin glacial deposits over bedrock, deep glacial till, thick peatlands
- Precipitation increases SW-NE
- Temperature decreases SW-NE
- Vegetation changes accordingly



8

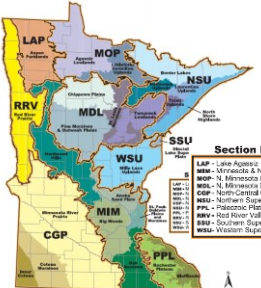
Eastern Broadleaf Forest Province

- Large province- Almost 12 million acres across MN, IA, WI, OH, NY, IL, IN, KT, MS, AR
- Transition between semi-arid prairie and semi-humid mixed forest of SE/NE
 - Prairie species meet eastern ranges
 - Forest species meet western ranges
- Landforms largely glacial deposits and recent erosion
- Precipitation approximately equals evapotranspiration
- Avg Precipitation 24-35 inches
- Avg temperatures 38-46 F



9

Ecological Sections & Subsections



Section Names

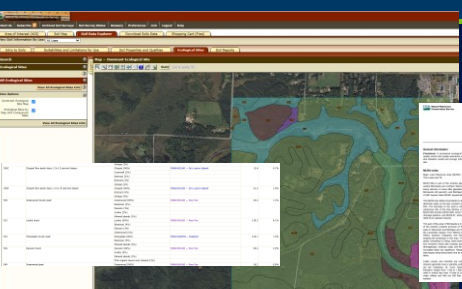
- LAP - Late Agassiz, Assen Parklands
- MOP - Minnesota & Ontario Peatlands
- NSU - Northern Superior Uplands
- MDL - Minnesota Delta & Lake Plains
- WWS - Western Superior Uplands
- WWSU - Western Superior Uplands
- CGP - Central Glaciated Plains
- PPL - Paleozoic Plateau
- SSU - Southern Superior Uplands

Sections (10): elevation, plant distribution and regional climate.

Subsections (26): defined by glacial deposits and features, surface bedrock, local climate, topography, distribution of plants

10

Ecological Site Descriptions



Go to:

- Soil Data Explorer
- Ecological Sites

11



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

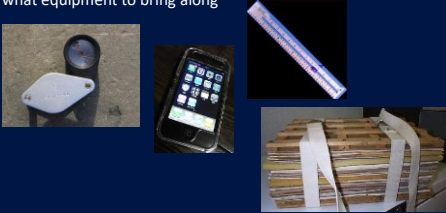


Reviewing aerial images of the site (including past images)

14

Office Review

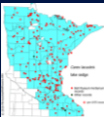
Determining what equipment to bring along



15

Office Review

Range Information / Maps / Atlases



MN Wildflowers

USDA Plants

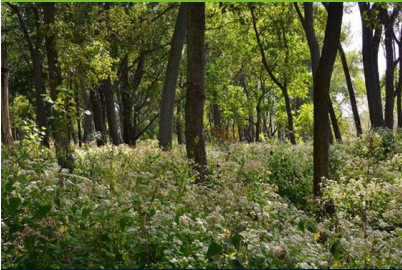
19

Site Analysis



20

Site Analysis



Time of Year – September

Soil – loamy, slightly rocky/gravelly

Habitat – disturbed woodland with sparse canopy

Indicator Plant species

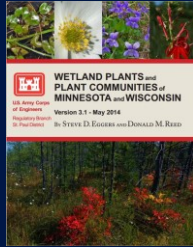


21

Eggers & Reed Classification System

Primarily based on plant communities, but includes "typical" associated hydrologic regimes

- Shallow, Open Water
- Deep Marsh
- Shallow Marsh
- Sedge Meadow
- Fresh (Wet) Meadow
- Wet/Wet-Mesic Prairie
- Calcareous Fen
- Open Bog/Coniferous Bog
- Shrub-Carr/Alder Thicket
- Hardwood Swamp/Coniferous Swamp
- Floodplain Forest
- Seasonally Flooded Basin



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Eggers & Reed Classification System

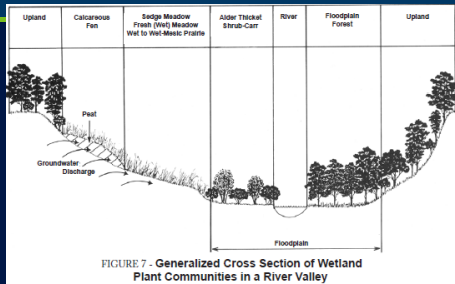


FIGURE 7 - Generalized Cross Section of Wetland Plant Communities in a River Valley

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Eggers & Reed Classification System

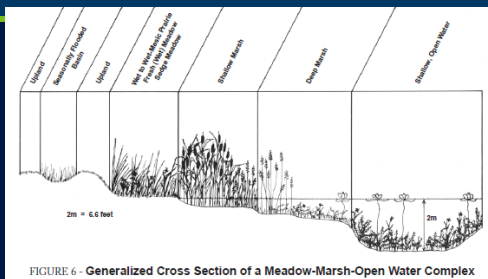


FIGURE 6 - Generalized Cross Section of a Meadow-Marsh-Open Water Complex

24

Many Plant Families:

Some common wetland plant 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)
- o Grasses (Poacea)
- o Sedges (Cyperaceae)



25

Vegetation Groups

Grasses

Sedges

Rushes

Ferns & Allies

Vines

Shrubs

Trees

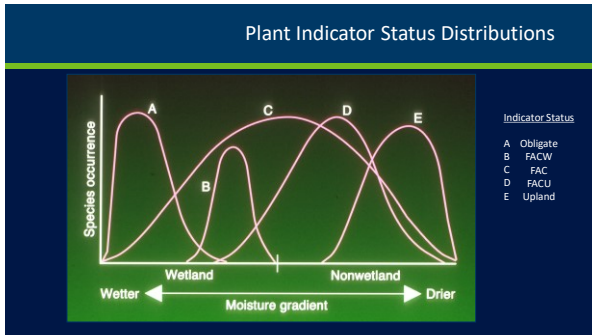
Forbs

26

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).

27



28

Shallow, Open Water

Hydrology: permanently inundated, Water depths less than 8.2 feet (2.5 meters)

Vegetation: Dominated by submergent, floating and floating-leaved species

© Steve D. Eggers

29

Shallow, Open Water

© Steve D. Eggers

Long-leaf pondweed (*Potamogeton nodosus*), leafy pondweed (*Potamogeton foliosus*) and wild celery (*Vallisneria americana*) dominate this example.

30

Deep Marshes



© Steve D. Eggers

Hydrology: **semi-permanently inundated** by 6 inches to 3 feet or more of water during the growing season

Vegetation: Dominated by herbaceous emergent, submergent, floating and floating-leaved species

31

Bulrushes (*Scirpus*, *Schoenoplectus*, *Bulboschoenus*)

River Bulrush

Bulboschoenus fluviatilis
(OBL)



Softstem Bulrush

Schoenoplectus tabernaemontani
(OBL)



32

Shallow Marshes

Hydrology: Soils saturated to the surface to inundated up to 6 inches of water for a significant portion of most growing seasons

Vegetation: Cattails, water plantain, bulrush, wild rice, wild iris, and bur reed



33

Bulrushes (*Scirpus*, *Schoenoplectus*, *Bulboschoenus*)

Green Bulrush
Scirpus atrovirens
(OBL)



Woolgrass
Scirpus cyperinus
(OBL)



34

Giant Bur-reed – *Sparganium eurycarpum*

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



Male

Female

Triangular leaf
cross-section



35

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

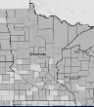


Gap in spike

36

Broadleaf Cattail – *Typha latifolia*

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

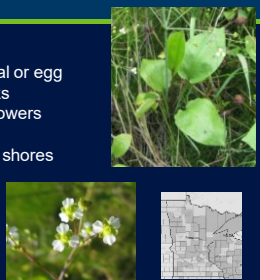



37

Water Plantain – *Alisma subcordatum*

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

NCNE	MW	GP
OBL	OBL	OBL

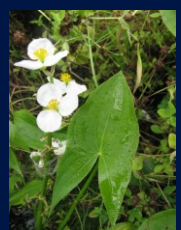



38

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

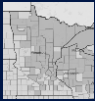



39

Harlequin Blue Flag Iris – *Iris versicolor*

- Deep purple base
- Blue flower with 3 petals, 3 sepals and large yellow center
- Found in the North

NCNE	MW	GP
OBL	OBL	OBL



40

Fresh (Wet) Meadows

Hydrology: Water table often drop below 12 inches after early portion of growing season

Vegetation: Dominated by grasses, such as reed canary grass and redtop, and/or forbs such as giant goldenrod and marsh aster



41

Bugleweed – *Lycopus americanus*



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

NCNE	MW	GP
OBL	OBL	OBL



42

Giant Goldenrod – *Solidago gigantea*

- Alternate, 3-veined leaves
- Wet sites

NCNE	MW	GP
FACW	FACW	FAC



43

Canada Goldenrod – *Solidago canadensis*

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

NCNE	MW	GP
FACU	FACU	FACU



44

Goldenrods

Disc flowers



Ray flower

stem texture

3 main veins



45

Boneset – *Eupatorium perfoliatum*

- Coarsely toothed leaf
- Perfoliate
- Hairy stem

NCNE	MW	GP
FACW	OBL	FACW





Leaves joined into one

46

Swamp Milkweed – *Asclepias incarnata*

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

NCNE	MW	GP
OBL	OBL	FACW





Tapering narrow leaf

47

Canada bluejoint (*Calamagrostis canadensis*)

NCNE	MW	GP
OBL	OBL	FACW



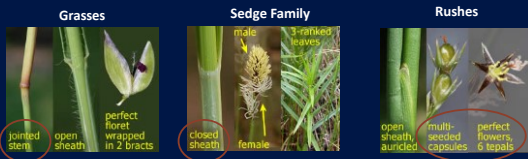


Tuft of heads in spikelets

Ligule side view

48

Grass like plants



Source: Minnesota Wildflowers
<https://www.minnesotawildflowers.info/page/grasses-sedges-rushes>

49

Reed canary grass (*Phalaris arundinacea*)



50

Sedge Meadows

Hydrology: Saturated soils most of the growing season.

Vegetation: Dominated by sedges, primarily *Carex*, but also woolgrass and other sedge family members, Canada blue-joint grass may be subdominant, can have floating mat (Sedge Mat) when fringing deeper hydrologic regimes

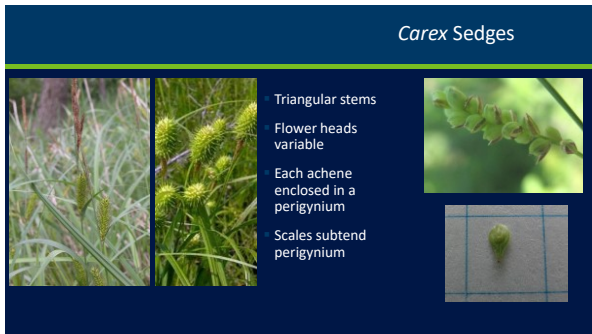


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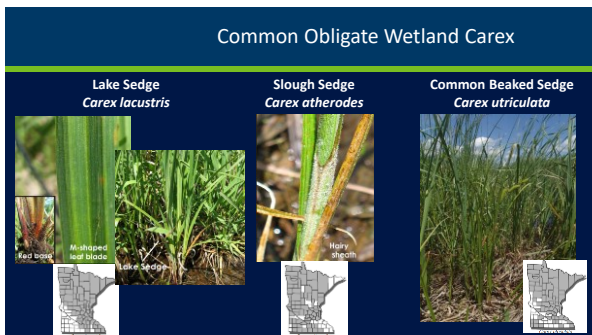
51



52



53



54

Common Wetland Carex

Awl fruited Sedge
Carex stipata
(OBL)



Cross-wrinkled
sheath, spongy stem



Tussock Sedge
Carex stricta
(OBL)



Fibers at
base of
stem



Fox sedge
Carex vulpinoidea

NCNE	MW	GP
OBL	FACW	FACW



Cross-wrinkled
sheath




55

Carex pellita




Woolly sedge
Carex pellita
(OBL)



56

Wet to Wet-Mesic Prairies

- **Hydrology:** Saturated soils most of the growing season
- **Vegetation:** Dominated by native prairie grasses, often with a rich diversity of hydrophytic prairie forbs such as Prairie cord-grass, big bluestem, gayfeather, green bulrush, mountain mint, sawtooth sunflower, New England aster, white lady-slipper, etc.



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57

Bluegrasses (*Poa spp.*)

Cool season grasses

Narrow leaves

Boat shaped leaf tips

Multiple flowers per spikelet





58

Kentucky Bluegrass (*Poa pratensis*)

NCNE	MW	GP
FACU	FAC	FACU






Fowl Bluegrass (*Poa palustris*)

NCNE	MW	GP
FACW	FACW	FACW






59

Redtop (*Agrostis gigantea*)



NCNE	MW	GP
FACW	FACW	FACW






60

Prairie Cordgrass (*Spartina pectinata*)



61

Big bluestem (*Andropogon gerardii*)



62

Seasonally Flooded Basins

Hydrology: seasonally flooded,
Typically ponded for a few weeks early
in the growing season then drying out

Vegetation: Mudflats left by receding
water are colonized by annuals



Condition shown is in May --
cropped corn field. By mid-to
late growing season, annual
species such as wild millet
(FACW) and smartweeds
(FACW-OBL) would dominate

63

Smartweed Family- *Polygonaceae*

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



64

Smartweeds

Pennsylvania Smartweed
[*Persicaria pensylvanicum*]
FACW



Thumbprint on leaf

Water Smartweed
[*Persicaria amphibium*]
OBL



Both at wet sites

65

Cyperus – Flatsedges, Nutsedges, Umbrella 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



66

Shrub-Carr and Alder Thickets

Hydrology: saturated to seasonally flooded

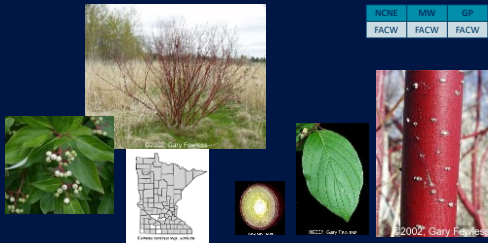
Vegetation: Native willows, dogwoods and/or alders dominate. Disturbed sites may have non-native glossy buckthorn.



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67

Red-osier Dogwood – *Cornus sericea*



NCNE	MIW	GP
FACW	FACW	FACW

68

Gray Dogwood – *Cornus racemosa*

NCNE	MIW	GP
FAC	FAC	FAC

- Dull, gray twigs
- Opposite leaves
- White berries on bright red pedicels



© Bruce D. Eggers

© Bruce D. Eggers

69

Silky Dogwood – *Cornus obliqua*

NCNE	MW	GP
FACW	FACW	FACW

- Magenta twigs
- Opposite leaves
- Dark blue berries



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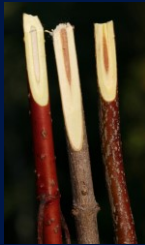
70

Twig Comparison

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

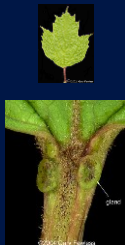


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71

Highbush Cranberry – *Viburnum opulus* var. *americanum*

NCNE	MW	GP
FACW	FAC	FAC



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72

Willows (*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



73

Hardwood and Coniferous Swamps

Hydrology: saturated, may be seasonally inundated

Vegetation: Black Ash, Tamarack/Black Spruce, no continuous sphagnum moss



74

Tamarack – *Larix laricina*

NCNE	SWW	GP
FACW	FACW	FACW

- Deciduous
- Needles are bunched
- Common to swamps and bogs

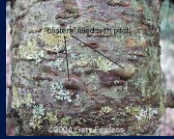


75

Balsam fir – *Abies balsamea*

- Needles continuous along stem and branches
- Needles $\frac{3}{4}$ to 1 inch and flat
- Cones are purple

NCNE	MMW	GP
FAC	FACW	FAC

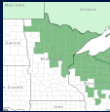


76

Black Spruce – *Pinus mariana*

- Branches short and drooping
- Needles are 4 angled with a blunt tip
- Dark (blackish) foliage

NCNE	MMW	GP
FACW	FACW	FACW



77

N. White Cedar – *Thuja occidentalis*

- Spicy fragrance when crushed
- Needles turn yellow-brown in winter
- Needles are bicolorous

NCNE	MMW	GP
FACW	FACW	FACW



78

Yellow Birch – *Betula alleghaniensis*

NCNE	MW	GP
FAC	FAC	FACU



79

Calcareous Fens



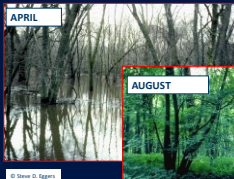
- Hydrology: upwelling groundwater discharge continuously saturates organic soils, Specific soil and water chemistry (CaCo)
- Vegetation: Rarest wetland type in MN. Supports disproportionate number of T & E species: sterile sedge, beaked spikerush, hardstem bulrush, Grass of Parnassus, Kalm's lobelia, white lady-slipper, Riddell's goldenrod

80

Floodplain Forests

Hydrology: seasonally inundated, relatively well-drained for most of the growing season

Vegetation: silver maple, American elm, river birch, green ash, black willow, box elder, eastern cottonwood



81

Maple - *Aceraceae*



Red maple
(Acer rubrum)



NCNE	MW	GP
FAC	FAC	FAC



Sugar maple
(Acer sacharum)



NCNE	MW	GP
FACU	FACU	UPL



Silver maple
(Acer sacharinum)



NCNE	MW	GP
FACW	FACW	FAC

82

Box Elder – *Acer negundo*

NCNE	MW	GP
FAC	FAC	FAC



Acer negundo
Three Leaves from the Same Tree

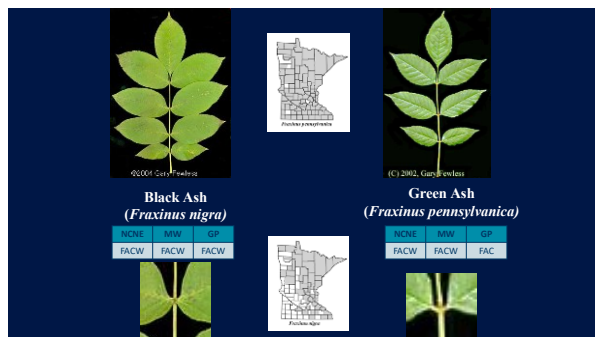
83

Ash - *Oleaceae*

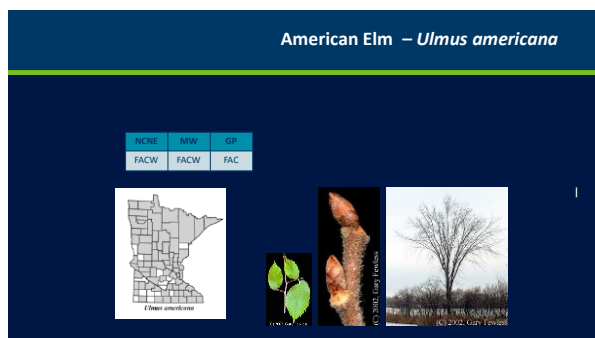



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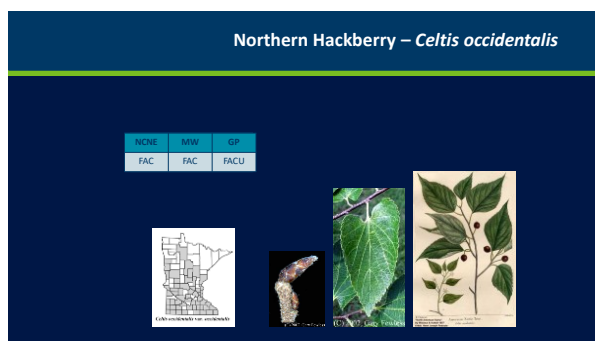
84



85



86



87

Summer Grape
(*Vitis aestivalis*)



NCNE	MW	GP
FACU	FACU	FAC



River-bank Grape
(*Vitis riparia*)



NCNE	MW	GP
FACU	FACW	FAC

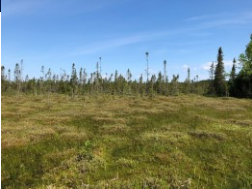


88

Open and Coniferous Bogs

Hydrology: **saturated, with** acidic, peat soils low in nutrients

Vegetation: tamarack, black spruce, continuous mat of *Sphagnum* moss, bog sedge, wire-grass sedge, cottongrass, leatherleaf, labrador tea and unique flora not found in any other habitat. Many orchid species.





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Sphagnum Moss

89

Eriophorum (Cottongrass)







Eriophorum angustifolium

90

Bog Birch – *Betula pumila*

NCNE	MW	GP
OBL	OBL	OBL



91

Meadowsweet – *Spiraea alba*

NCNE	MW	GP
FACW	FACW	FACW

- Alternate leaves
- Leaves not woolly



92

Steeplebush – *Spiraea tomentosa*

NCNE	MW	GP
FACW	FACW	FACW

- Leaves alternate
- White to orange woolly undersides

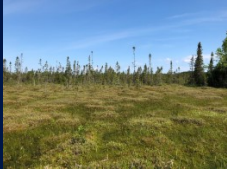


93

Uplands

Hydrology: saturated, with acidic, peat soils low in nutrients

Vegetation: tamarack, black spruce, continuous mat of *Sphagnum* moss, bog sedge, wire-grass sedge, cottongrass, leatherleaf, labrador tea and unique flora not found in any other habitat. Many orchid species.



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Sphagnum Moss

94

Carex pensylvanica (Upland)





95

Switchgrass (*Panicum virgatum*)

NCNE	MIW	GP
SAC	SAC	SAC





96

Bromegrass (*Bromus inermis*)

NCNE	MW	GP
UPL	FACU	UPL



Winkle "M" shaped

Closed sheath

97

Canada Wild Rye (*Elymus canadensis*)

NCNE	MW	GP
FACU	FACU	FACU



98

Quack Grass (*Elymus repens*)

NCNE	MW	GP
FACU	FACU	FACU



Virginia Wild Rye (*Elymus virginicus*)

NCNE	MW	GP
FACW	FACW	FAC



99

Yellow Sweet Clover - *Melilotus officinalis*

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



NCNE	MW	GP
FACU	FACU	FACU





100

Wild Parsnip – *Pastinacea sativa*

- Contact with the plant can cause a sun-induced rash
- Compound umbel of yellow flowers with 5 petals
- Pinnately lobed leaves
- Tall growth habit.



NCNE	MW	GP
UPL	UPL	UPL





101

Wild Parsnip




Golden Alexanders




USDA-NRCS PLANTS Database / Delton, N.J., and A. Brown. 2012. An Illustrated Atlas of the native and exotic plants, shrubs and the grasses. 2nd ed. Chino, California: iStockphoto.com, 2012.

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102

Eastern White Pine – *Pinus strobus*

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

NCNE	MW	GP
FACU	FACU	FACU



103

Jack Pine – *Pinus banksiana*

NCNE	MW	GP
FACU	FACU	FACU

- Adapted for fire
- Serotinous cones
- Germinate best on mineral soil



104

White Spruce – *Picea glauca*

- Short blue green needles
- Needles are born singly
- Branches slightly droop

NCNE	MW	GP
FACU	FACU	FACU



105

Paper Birch – *Betula papyrifera*

NCNE	NW	GP
FACU	FACU	FACU



106

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

NCNE	NW	GP
FACU	FACU	FACU

N. Pin Oak
(*Q. ellipsoidalis*)

NCNE	NW	GP
UPL	UPL	UPL

Bur Oak
(*Q. macrocarpa*)

NCNE	NW	GP
FACU	FAC	FACU



107

Populus spp.

Balsam Poplar
(*Populus balsamifera*)

NCNE	NW	GP
FACU	FACU	FACU

Bigtooth Aspen
(*P. grandidentata*)

NCNE	NW	GP
FACU	FACU	FACU

Trembling Aspen
(*P. tremuloides*)

NCNE	NW	GP
FACU	FAC	FAC



108

Cottonwood – *Populus deltoides*

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

NCNE	SMW	GP
FAC	FAC	FAC



109

Red Raspberry – *Rubus idaeus ssp. strigosus*

NCNE	SMW	GP
FACU	FACU	FACU

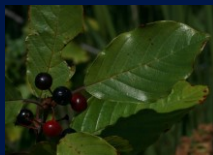


110

Glossy Buckthorn – *Frangula alnus*

- Leaf margins entire (not toothed)

NCNE	SMW	GP
FAC	FACW	FAC



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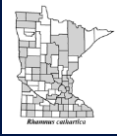
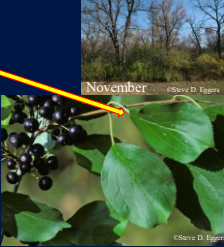
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111

Common Buckthorn – *Rhamnus cathartica*

- Leaf margins with fine teeth

NCNE	MW	GP
FAC	FAC	FACU

November ©Steve D. Eggers

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112

DO NOT TOUCH!

Wild Parsnip



Water Hemlock



Poison Ivy



Poison Sumac



Nettles



Poison Hemlock



113
