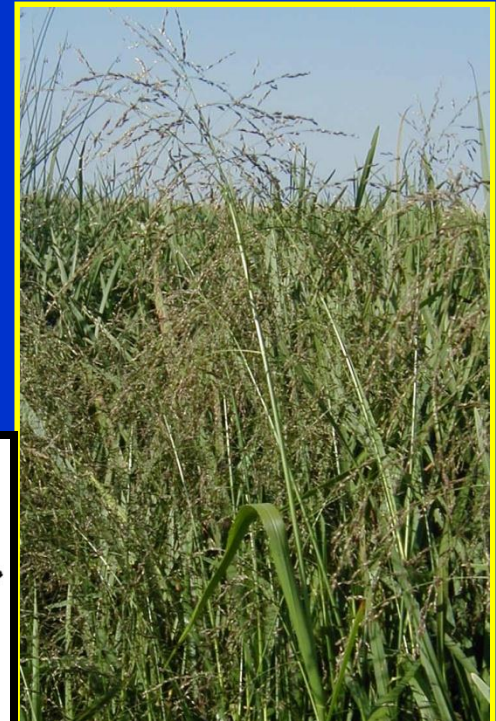
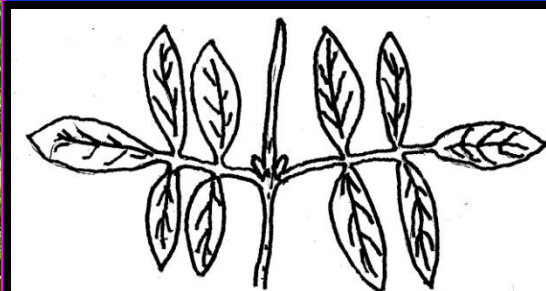
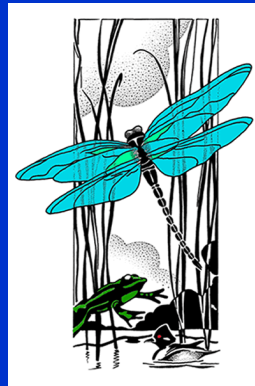


# Identifying wetland plants virtually!!

## Wetland Health Evaluation Program (WHEP)

June 24, 2020 – Mark Gernes, [mark.gernes@state.mn.us](mailto:mark.gernes@state.mn.us)

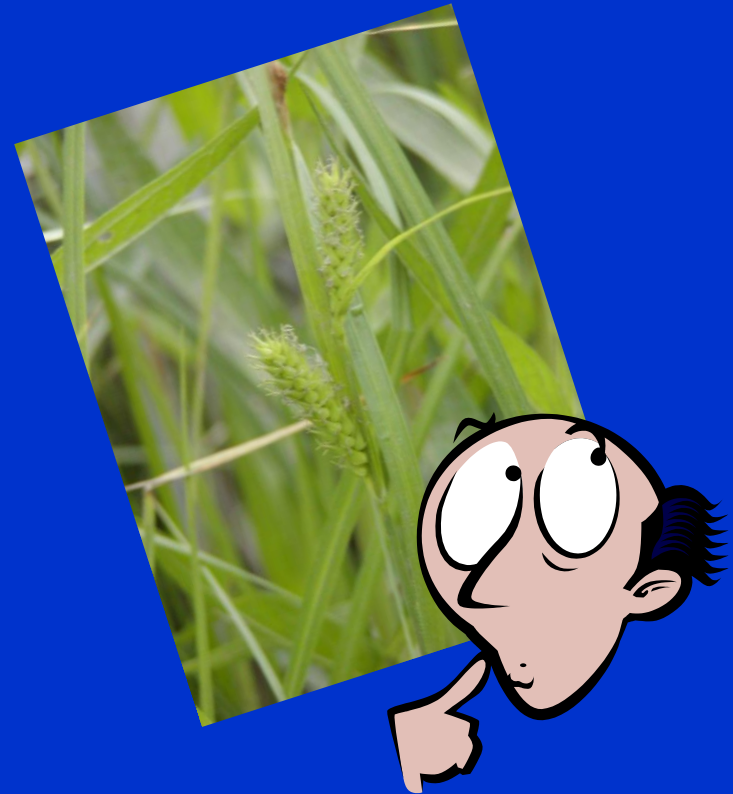
---



# ...basic id

---

- Minimal terminology
- Applied at the “genus” level (“Gernes” - Mark)
- 90+ most common wetland “taxa”
- Good foundation to have fun and ...  
maybe go beyond  
this basic start!



# A CITIZEN'S GUIDE TO THE BIOLOGICAL ASSESSMENT OF WETLANDS



## THE VEGETATION INDEX OF BIOLOGICAL INTEGRITY (IBI)



Minnesota Pollution  
Control Agency

*Field & Laboratory  
Protocols, Pictorial  
Key to the  
Common Wetland  
Plants*



Minnesota Pollution Control Agency

KEY TO WETLAND PLANTS



### WOODY PLANTS

p. 24-30

Plants with woody stems, such as shrubs, vines, and trees.



### MOSS & LICHEN

p. 31

Nonvascular plants growing on various surfaces like rocks and downed trees.



### EMERGENT PLANTS

p. 32-48

Herbaceous, emergent plants with broad or linear leaves that are not grasslike and are growing on saturated soil or clearly growing above the water surface.



### GRASSLIKE PLANTS

p. 50-56

Plants with flat linear leaves arising from distinct stems or basal, or leaves round and like the stem in appearance.



### FLOATING ROOTED PLANTS

p. 57-58

Aquatic plants that are rooted in the bottom of the wetland and have leaves that float on top of the water surface.



### SUBMERSED PLANTS

p. 59-63

Aquatic plants that have stems and leaves that grow entirely underwater growing near shore to the deepest part of the littoral zone.



### FREE FLOATING PLANTS

p. 64-65

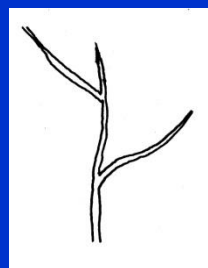
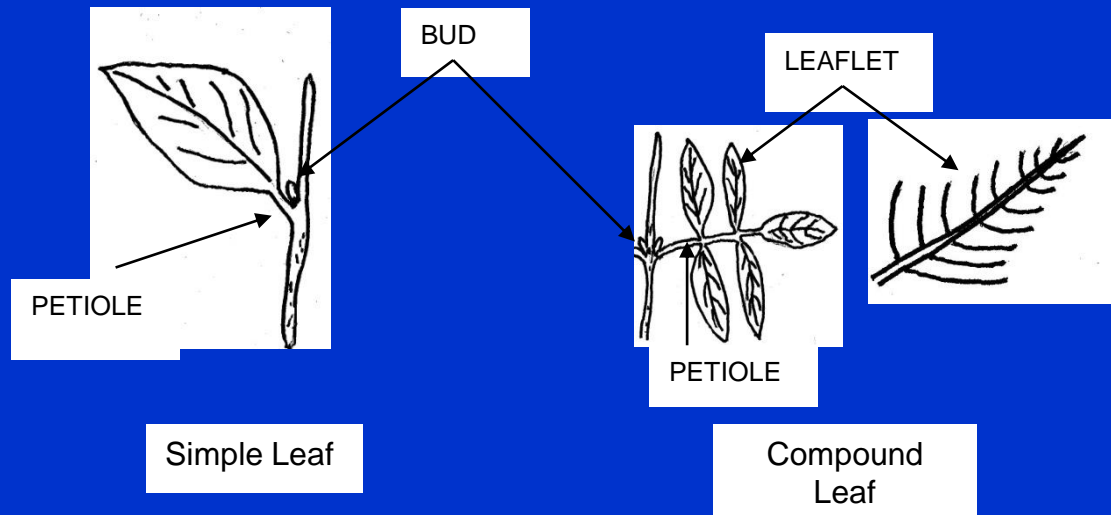
Aquatic plants that float on the surface of the water, such as duckweed.

WETLAND PLANT IDENTIFICATION GUIDE

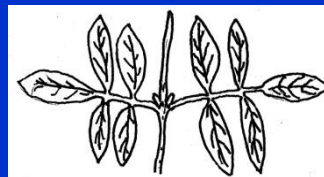
PAGE 23

[http://www.mnwhep.org/sitebuildercontent/sitebuilderfiles/veg\\_manual\\_3.1-proof2.pdf](http://www.mnwhep.org/sitebuildercontent/sitebuilderfiles/veg_manual_3.1-proof2.pdf)

<https://www.hennepin.us/-/media/hennepinus/your-government/get-involved/documents/WHEP-vegetation-IBI-2015.pdf?la=en&hash=70DC815BC7F2A3A94BC2167F20600ED5B6106ACA>



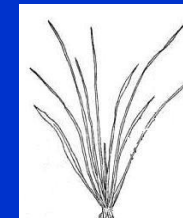
Alternate



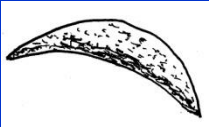
Opposite



Whorled



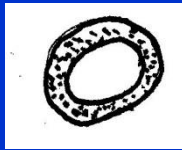
Basal



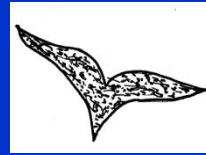
***Typha***  
leaf



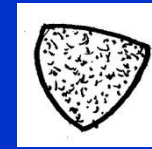
***Iris***  
leaf



**Grass**  
stem



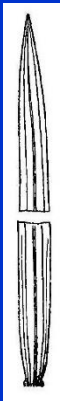
***Sparganium***  
leaf



***Carex,***  
***Scirpus***  
stem



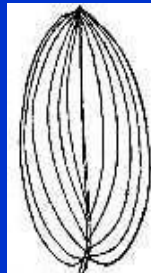
***Acorus***  
leaf



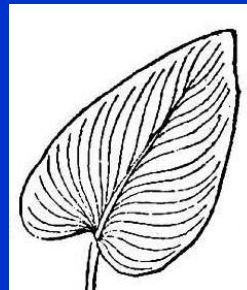
Linear



Lanceolate



Elliptic



Cordate



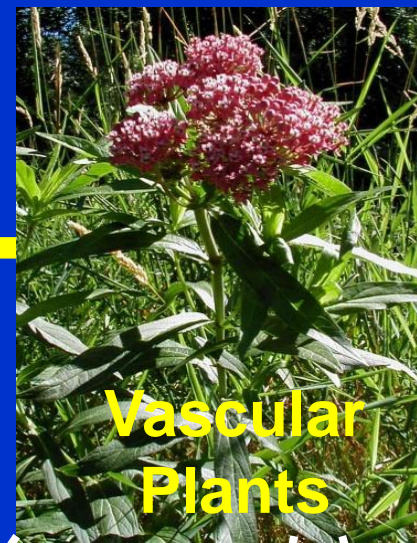
Ovate



Branched



**Wetland  
Plants**



**Vascular  
Plants**



**Grasslike**

**Low vascular  
plants**



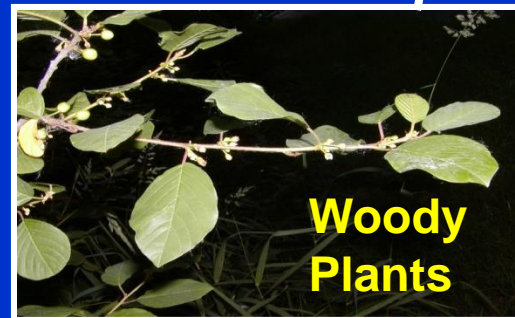
**Ferns & Horsetails**

*Thelypteris*



**Nonvascular Plants**

**Chara, Mosses; Lichen;  
Riccia fluitans;  
Ricciocarpus natans**



**Woody  
Plants**

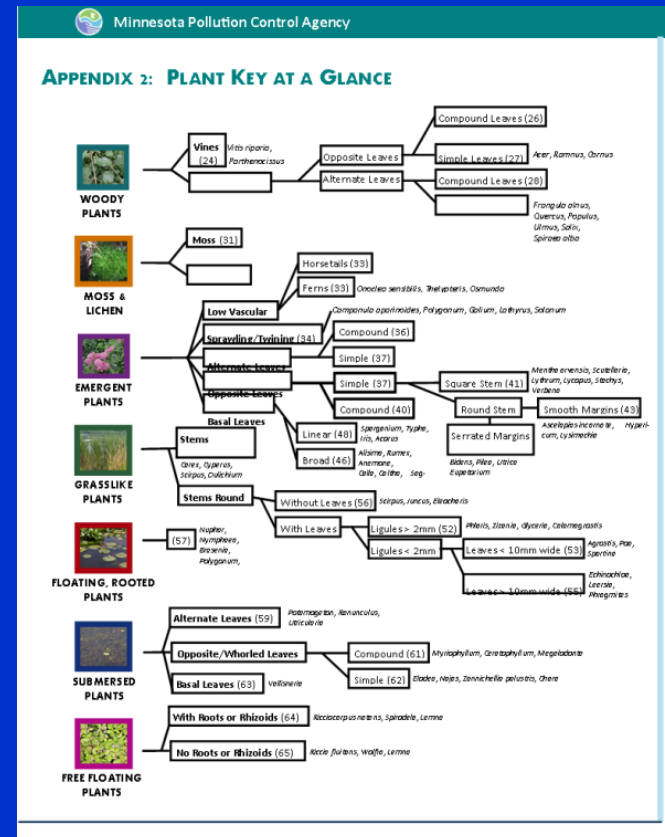
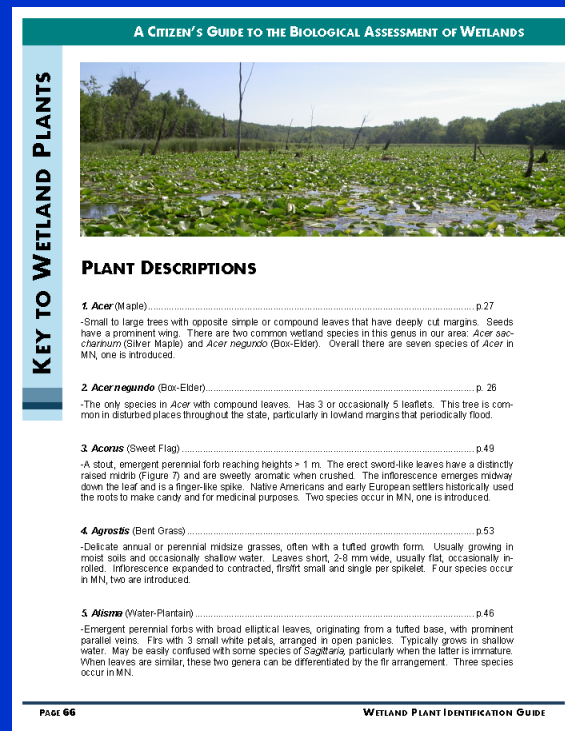


**Forbs**

# Manual Resources

- Glossary p 79
- Plant and leaf Diagrams pp 80-81
- Bibliography pp 82-83

## Plant descriptions: pp 66-77

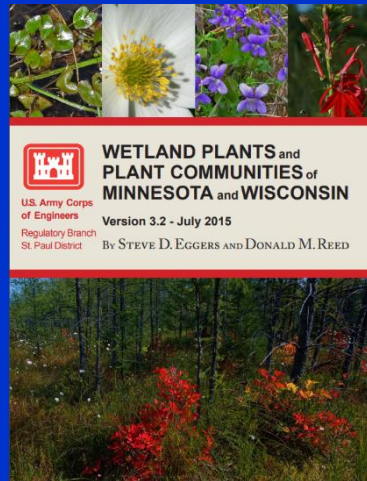


## Appendices – Plants at a Glance p 85

# Additional Resources

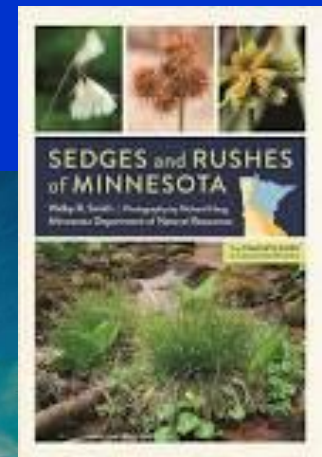
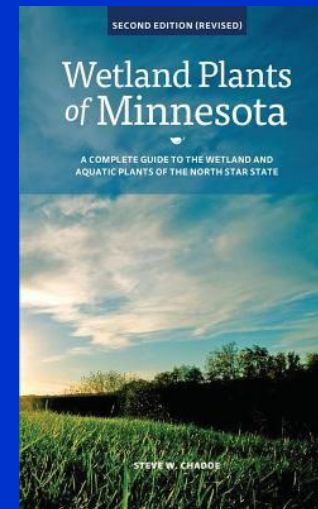


<https://www.minnesotawildflowers.info/>

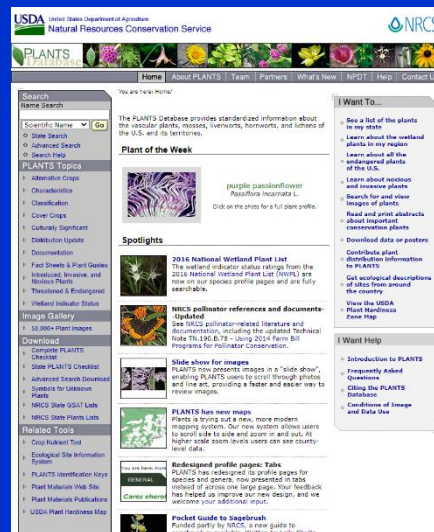


<https://www.mvp.usace.army.mil/Portals/57/docs/regulatory/WetlandBook/WetlandBook2016/Part%201%20-%20Introduction,%20Key%20to%20Plant%20Communities,%20Shallow,%20Open%20Water%20Communities.pdf>

Hard copy resources



<https://plants.sc.egov.usda.gov/java/>



# Key to learning plants - dichotomous (trichotomies)

1. Read both choices – understand the differences
  - Consult glossaries or other resources to understand terms
2. Observe plant characteristics
3. Decide couplet path, continue....
4. Does it make sense?


## Your plant senses:

- **Observe**
  - shape or edges
  - position or branching
  - size & color
- **Feel**
  - hairs, stem angles
- **Smell**
  - mints

ask a friend....

**A CITIZEN'S GUIDE TO THE BIOLOGICAL ASSESSMENT OF WETLANDS**

KEY TO WETLAND PLANTS



### Emergent Plants

Herbaceous, emergent plants with broad or linear leaves that are not grasslike and are growing on saturated soil or clearly growing above the water surface.

**ALTERNATE LEAVED FORBS**

**Simple leaves: go to pages 37-39**

**Compound leaves**

*(Pages 36-37)*

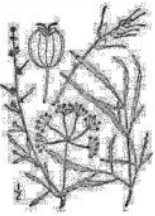

**CICUTA**  
(Water-Hemlock) #18

**Leaves:** twice compound, leaflets 1-35mm wide, 2-4 inches long, sharply toothed, leaf veins stop at the bottom of leaf serrations and not at the tips, which helps to identify this plant

**Flowers:** tiny white flowers with 5 petals that grow in clusters 2-8" wide, spring, early summer

**Stem:** smooth, hollow and often with purplish-green striations.

**Caution:** this plant is poisonous.






**POTENTILLA (Comarum)**  
*palustre*  
(Marsh-Cinquefoil) #61

**Leaves:** 5-7 toothed leaflets, leaves nearest to the flowers sometimes have just three leaflets, rounded at the tip

**Stem:** sprawling, bottom of stem is reddish-brown, woody, smooth, fine hairs below flowers

**Flowers:** reddish purple flower, five red sepals bigger than its five petals, summer

PAGE 36

WETLAND PLANT IDENTIFICATION GUIDE

# Woody Plants (vines, shrubs, or trees)



Minnesota Pollution Control Agency

## SHRUBS OR TREES

**Opposite, compound leaves: go to page 26**



**Opposite, simple leaves: go to page 27**



**Alternate, compound leaves: go to page 28**



**Alternate, simple leaves: go to pages 28-30**



Woody Plants



Cornus



Salix

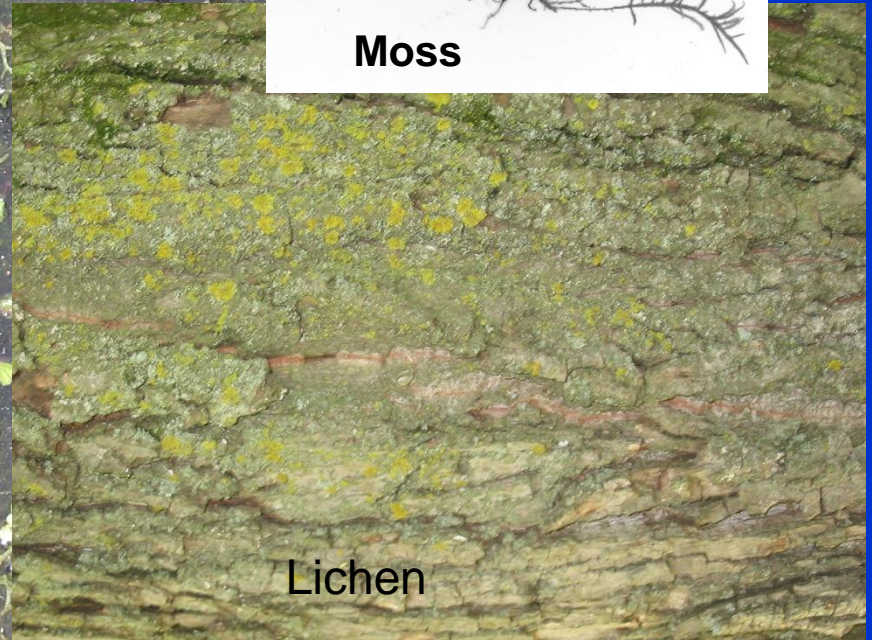
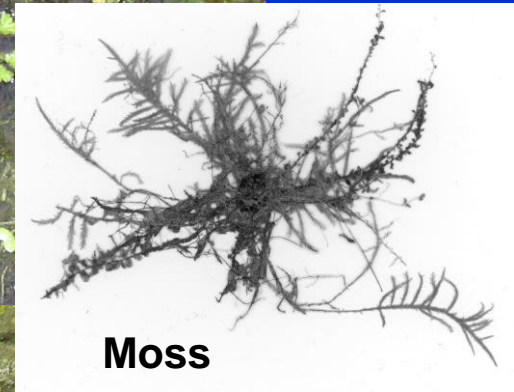
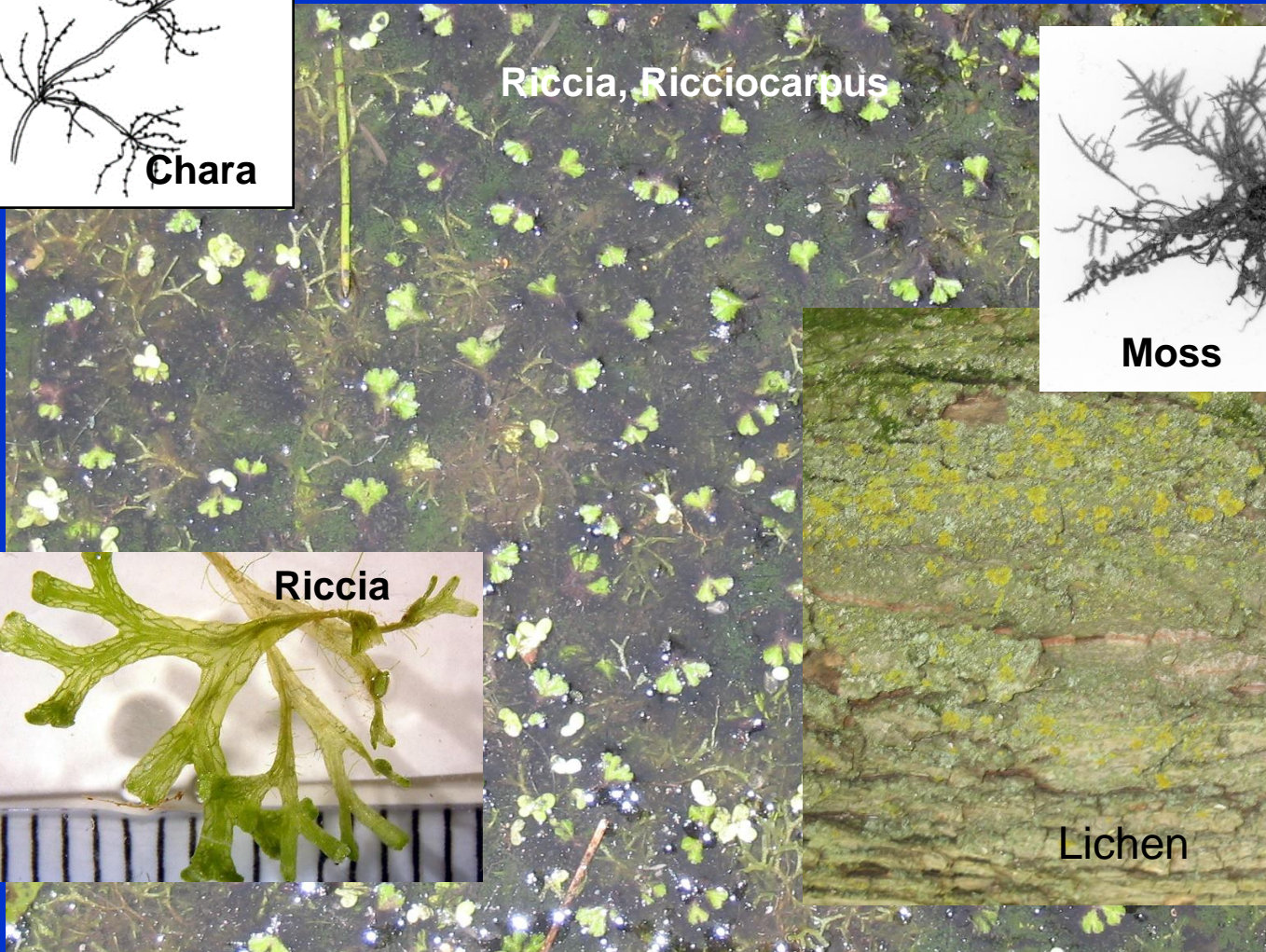
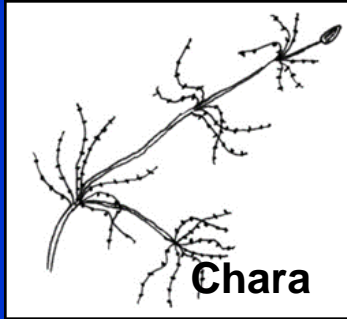


Fraxinus

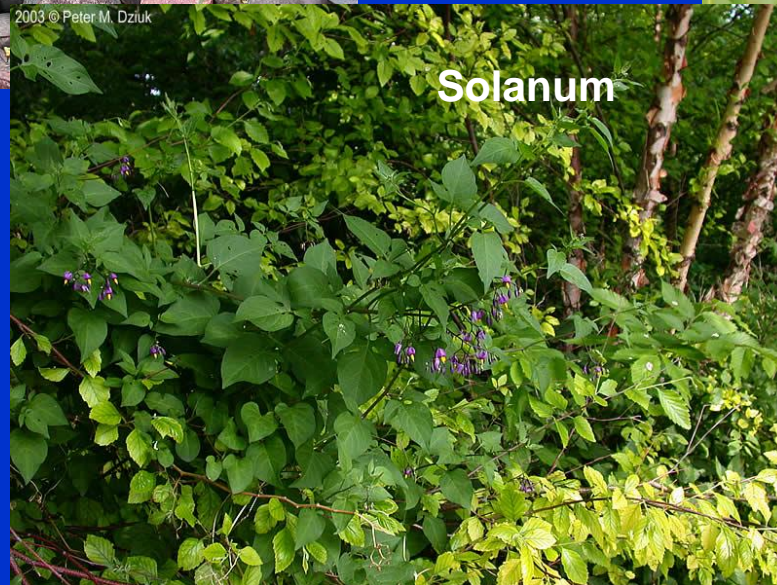


Vitis

# Nonvascular – moss, macroscopic algae, liverworts and lichens



# Sprawling or twining emergent forbs



# Emergent forbs with alternate leaves (simple or compound)

---



Impatiens

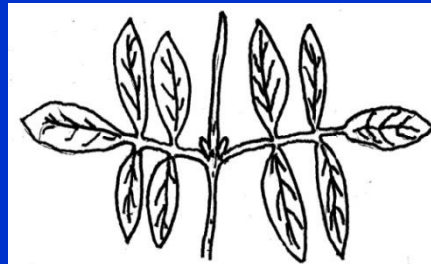


Sium

manual pp 36-39

# Emergent forbs with opposite (or whorled) leaves

---



manual pp 40-45

'Look for bud or leaf sheathing'

# Basal leaved emergents

---



Typha



Sparganium



Calla



Alisma

“Tufted”

manual pp 46-49

# Grasslike plants (grasses, sedges and '*true*' rushes)

---



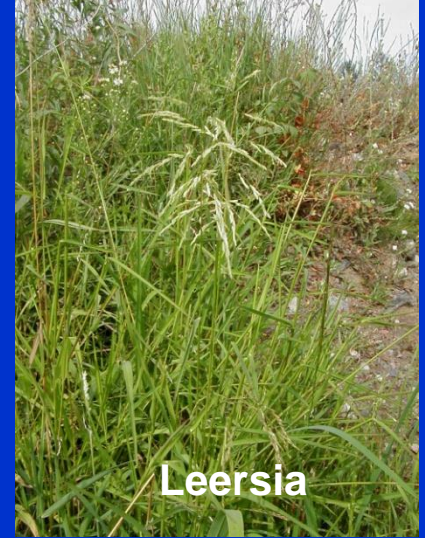
Dulichium



Carex



Glyceria

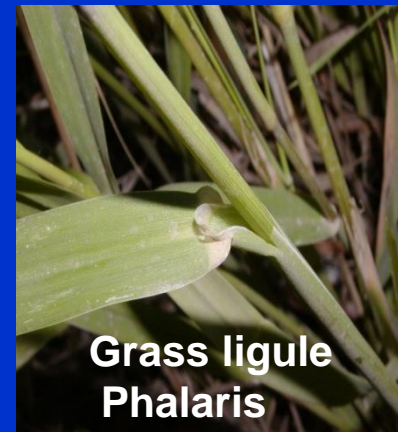


Leersia



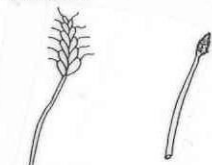
Juncus

2014 © Peter M. Dziuk



Grass ligule  
Phalaris

Name	Grass	Spike Rush	Three-way Sedge	True Rush	Nut Sedge	Sedge	Bullrush
Taxon	(Various)	<i>Eleocharis</i>	<i>Dulichium</i>	<i>Juncus</i>	<i>Cyperus</i>	<i>Carex</i>	<i>Scirpus</i>
Bracts below flower/fruit --	No leaflike bract under the flwr/frt	No leaflike bract under the flwr/frt	No leaflike bract under the flwr/frt	One or more leaflike bracts below the flwr/frt	One or more leaflike bracts below the flwr/frt	Often with a leaflike bract under the flwr/frt	One or more leaflike bracts below the flwr/frt
Seed/fruit arrangement --	Seeds enclosed within two or more scalelike leaves	Seeds are attached to scalelike bracts	Seeds are attached to scalelike bracts which are arranged in two vertical rows	Many tiny seeds within a capsule	Seeds are attached to scalelike bracts which are arranged in two vertical rows	Each seed within a saclike bract called the "Perigynium"	Seeds are attached to scalelike bracts which are arranged in a spiral
Stems --	Stems flat or round and hollow except at joint	Stems round and hollow	Stems round and hollow	Stem usually round often hollow	Stem is angled often appearing triangular, usually solid	Stem triangular or round and usually solid	Stem triangular or round and usually solid
Leaf arrangement --	Leaves 2-ranked	No leaves	Leaves 3-ranked	Leaves two ranked	Leaves 3-ranked	Leaves 3-ranked	Leaves 3-ranked or absent
Leaf Sheath -- open /closed)	Leaf sheath split down one side	No leaves, green stem	Leaf sheath not split (closed) down side	Leaf sheath not split (closed) down side	Leaf sheath not split (closed) down side	Leaf sheath not split (closed) down side	Leaf sheath not split (closed) down side



bracts absent



leaflike bracts



bract



bract



capsule with seeds



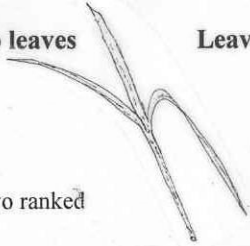
Two rows



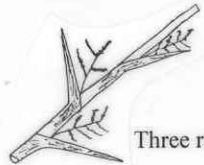
Perigynium



Spiral



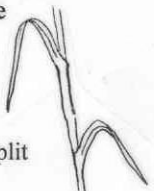
Two ranked



Three ranked



Leaf sheath open, split



Leaf sheath closed, not split

# Floating Aquatic plants

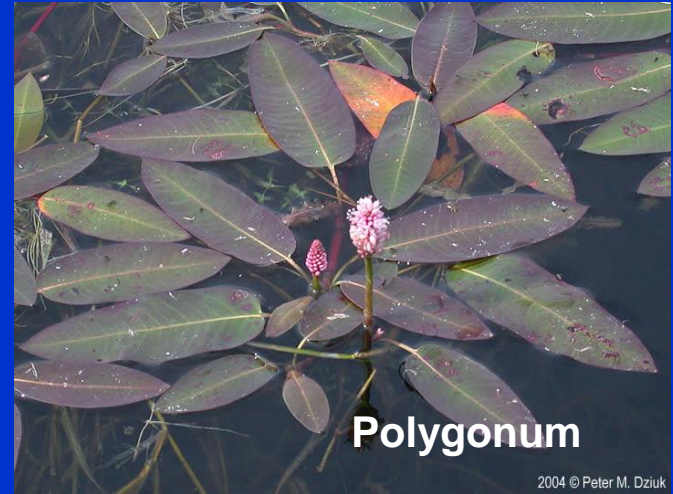
Lemna, Spirodela & Wolffia



Note: Most are vascular,  
but a couple are  
nonvascular

manual pp 57-65

Polygonum



2004 © Peter M. Dziuk



Nymphaea

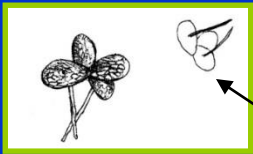


2010 © Peter M. Dziuk

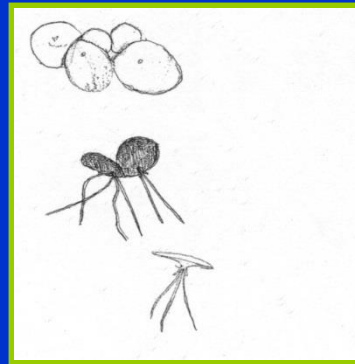
# Small floating wetland plants

Generally less than 3 x 3 cm in size

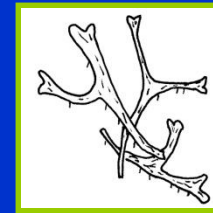
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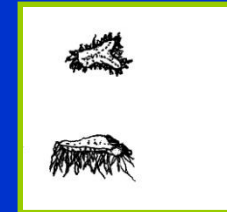
*Lemna*  
(forb)



*Spirodela*  
(forb)



*Riccia*  
(nonvascular)

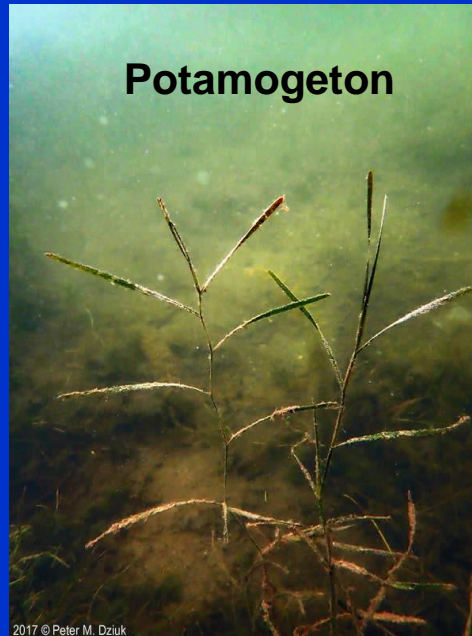


*Ricciocarpus*  
(nonvascular)

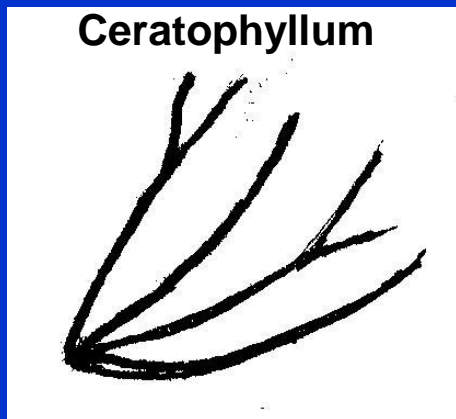


*Wolffia*  
(forb)

# Aquatic submergent



Some taxa may be partly emergent during at least part of the time



Branching is important!



manual pp 59-63

Ranunculus

# Field and metric data sheets

## MN WHEP VEGETATION SURVEY FIELD SHEET: RELEVÉ DATA

Site Name: JPK Date/Time: July 20, 2015  
 Team Leader/Observer: Steve Huff Team Name: West Valley  
 Local Sponsor: \_\_\_\_\_ County: Hennepin

Releve Dimensions (circle one): 10 m x 10 m or 5 m x 20 m = 100 m<sup>2</sup>  
 Is the releve typical of the wetland plant community? (circle one): Yes or No (explain below)  
 Water depth in the plot (meters): Shallowest: 0.2 m Deepest: 0.8 m  
 Substrate/bottom description: Mucky over gravel

Comments: Green filamentous algae present.

**DIRECTIONS:** If present in your releve, mark an "X" by the appropriate plant in the Pres column. Write in the known scientific name of any plants that are not already included in this table. If the plant cannot be identified, describe the plant as best as possible on page 2 under "Additional Unknown Plants". Next, use the box in the lower right corner of this page to determine the cover class (CC column) for the plant and write in the appropriate number by each plant.

Pres	CC	WOODY PLANTS	Pres	CC	EMERGENT PLANTS (continued)
		Acer (maple, box elder)			Eupatorium (fox glove)
XX	1	Cornus (dogwood)			Euthamia (grass-leaved goldenrod)
		Frangula alnus (golden-buckthorn)			Galium (bedstraw)
		Fraxinus (ash)			Hypericum (St. John's wort)
		Parthenocissis (Virginia creeper)			Impatiens (jewel weed)
		Populus (aspen, cottonwood)			Iris (iris)
		Quercus (oak)			Lathyrus (wild pea)
		Rhamnus cathartica (common buckthorn)	XX	1	Lycopus (bugle weed)
		Rubus (raspberry, blackberry)			Lysimachia (loosestrife)
		Salix (willow)	XX	2	Lythrum (loosestrife)
		Spiraea alba (meadowsweet)	XX	1	Mentha (field mint)
		Ulmus (elm)			Oncoclea sensibilis (sensitive fern)
XX	1	Vitis riparia (wild grape)			Osmunda (osmunda)
					Pilea (clever weed)
					Polygonum (smartweed) - duplicate in Floating Rooted
					Rumex (dock)
			XX	3	Sagittaria (arrowhead)
					Scutellaria (skullcap)
					Sium (water parsnip)
					Solanum dulcamara (nightshade)
					Solidago (goldenrod)
					(Emergent Plants continued on next page)
Pres	CC	EMERGENT PLANTS			
		Acorus (sweet flag)			
XX	1	Alisma (water plantain)			
		Anemone Canadensis (anemone)			
		Asclepias incarnata (swamp milkweed)			
		Aster (aster)			
		Bidens (beggar-ticks)			
		Calla palustris (water arum)			
		Caltha palustris (marsh marigold)			
		Campanula aparinoides (marsh bellflower)			
		Cicuta (water hemlock)			
		Cirsium (thistle)			
		Comarum (Potentilla) palustre (marsh cinquefoil)			
		Epilobium (willow herb)			
		Equisetum (horsetail)			

Cover Class (CC)	Percent Cover Range
5	50-75%
4	25-50%
3	5-25%
2	1-5%
1	0-1%

## A CITIZEN'S GUIDE TO THE BIOLOGICAL ASSESSMENT OF WETLANDS

### MN WHEP VEGETATION SURVEY METRIC SCORING SHEET

Site Name: \_\_\_\_\_ Team Name: \_\_\_\_\_ Date Sampled: \_\_\_\_\_

#### 7) Persistent Litter

-Record the cover class (CC) of each plant taxa listed below that was found in your plot. Determine the midpoint % cover and sum all of the values to score this metric. The midpoint % cover is the middle percentage of the range that a CC represents. Da

##### a. Sum of midpoint percent cover:

Plant	CC	Midpoint %	CC	Percent Cover Range	Midpoint %
Typha (Cat Tail)	_____	_____			
Sparganium (Bur-Reed)	_____	_____	6	75-100	87
Lythrum (Loosestrife)	_____	_____	5	50-74	63
Phragmites australis (Giant Reed)	_____	_____	4	25-49	38
Scirpus (Bulrush)	_____	_____	3	5-24	15
Polygonum (Smartweed)	_____	_____	2	2-5	3
			1	0-1	0.5

Total Midpoint %: \_\_\_\_\_ (%)

##### b. Metric #7 Score:

##### Scoring criteria for Persistent Litter

Total Midpoint %	Score
≤ 27%	5
28 - 54%	3
> 54%	1

Comments: \_\_\_\_\_

#### IBI Summary

-Tally your results from the seven metrics and add them together to arrive at a wetland vegetation IBI score and condition assessment for the site.

Metric	Score	
1) Vascular Genera	_____	
2) Nonvascular Taxa	_____	
3) Grasslike Genera	_____	
4) Carex Cover	_____	
5) Utricularia Presence	_____	
6) Aquatic Guild	_____	
7) Persistent Litter	_____	
Total:	_____	
Wetland Condition Assessment: _____		

##### Site Score Interpretation

IBI Score	Wetland assessment
26 - 35	Excellent
16 - 25	Moderate
7 - 15	Poor

Have fun and enjoy the wetlands!!



[mark.gernes@state.mn.us](mailto:mark.gernes@state.mn.us)