# Deep Lake



## Shoreline Vegetation Survey 9/13/18

This document details the methods and findings of a shoreline vegetation survey completed on Deep Lake.

Data collected and prepared by Ramsey County Soil & Water Conservation Division for

Vadnais Lake Area Water Management Organization 800 East County Rd E. Vadnais Heights, MN 55127

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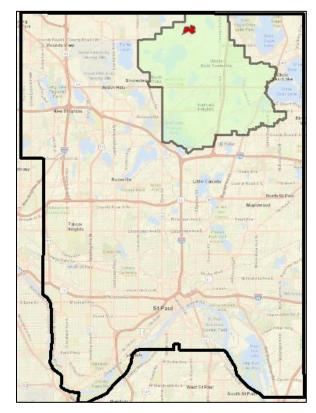


Figure 1. Location of Deep Lake (red) in Ramsey County within VLAWMO borders

## Deep Lake Shoreline Vegetation Survey

September 13 & 14, 2018

#### Background:

Deep Lake is located in North Oaks, MN along the northern boundary of Ramsey County and the Vadnais Lake Area Watershed Management Organization (VLAWMO) [Figure 1].

About 2/3 of the shoreline of Deep Lake is classified as Northern Mixed Cattail Marsh (MRn83) [Figure 2-A], (MN DNR, 2014). Details characterizing the vegetation structure, composition, landscape, and natural history of this native plant community can be found within Appendix A of this report. The remaining 1/3 of the shoreline is in the more developed and higher-elevation southern/southwestern perimeter of the lake.

Within the US Fish & Wildlife Service's National Wetland Inventory (Cowardin Classification System), there are three predominant classifications around Deep Lake: PEM1C, PEM1F, and PSS1C, which correspond to Shallow Marsh and Shrub Wetland [Figure 2-B]. PEM1C and PEM1F refer to palustrine, emergent, persistent marshes that are seasonally flooded (1C) or semi-permanently flooded (1F), whereas PSS1C is identified as a palustrine scrub-shrub, broad-leaved deciduous wetland that is seasonally flooded (Cowardin *et al.*, 1979). PEM1C covers the northwest shoreline, PSS1C covers the northern shoreline to the east, and PEM1F covers the eastern and southeast shoreline. These three areas that immediately border the lake add up to 26.24 acres, or 106,190 square meters.

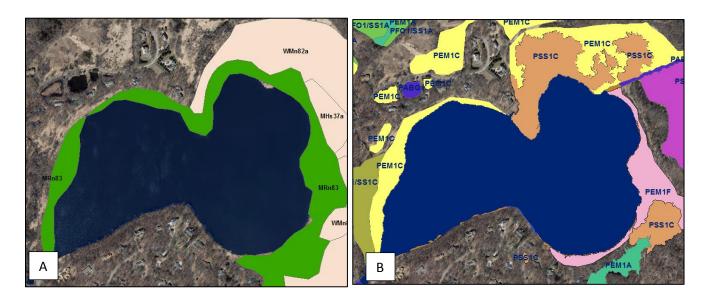


Figure 2-A. Left: Deep Lake Shoreline Classification by Native Plant Community (left) as MRn83, or Northern Mixed Cattail Marsh, (Source: MNDNR Native Plant Community shapefile)
Figure 2-B. Right: Deep Lake Shoreline Wetland Classification by National Wetland Inventory as three major wetland types: PEM1C, PEM1F, and PSS1C (Source: Wetlands\_NWI2010 shapefile from Ramsey County).

#### Methods:

The vegetation sampling method chosen for this survey was quadrat-transect, as first developed by Curtis and McIntosh (1950). Around the perimeter of Deep Lake, six evenly spaced transect lines perpendicular to shore were pre-drawn in ArcMap with the objective of documenting environmental variations across the areas of study, including each of the different wetland classifications as well as the disturbed southern perimeter of the lake. To best account for vegetation present within dense herbaceous cattail marsh habitats, a one square meter quadrat was used within this survey (Goldsmith et al., 1986). Systematic sampling, using defined intervals for transect and quadrat placement, was chosen to best investigate spatial patterns in plant species and abundance along the lake shore (Barbour et al., 1987).

In the field, individual plants lying within a 1meter square quadrat [Figure 3] were identified and counted at each of 4 locations along each transect line: at the interface with the lake (0 m), 5 m from shore, 10 m from shore, and 15 m from shore, for a total of 24 quadrat sample sites. A GIS shapefile was loaded into a Trimble GPS unit prior to the field work in order to locate each transect in the field. One 10-m alteration to a transect location was made in the field in order to better characterize local plant diversity. All transect locations were verified in the field by taking waypoints with the Trimble GPS at the 0 m and 15 m transect endpoints, and are accurately represented in the transect location map in Figure 4.



Figure 3. Placement of the 1-m square quadrat on Transect E, 0m from shore.

The quadrat-transect plant sampling method allowed for the computation of statistics including cover, density, and frequency of each species recorded, as calculated using the equations below (Cox, 1990).

$$\label{eq:Relative Coverage} \begin{split} &Relative \ Coverage = \frac{\% \ of \ individual \ species \ occuring \ in \ all \ quadrats}{\% \ cover \ of \ all \ species \ occuring \ in \ all \ quadrats} \end{split}$$
 
$$Density = \frac{\# \ of \ individuals}{Total \ area \ sampled}$$
 
$$Relative \ Density = \frac{Species \ density}{Total \ density \ for \ all \ species} \times 100$$
 
$$Frequency = \frac{\# \ of \ quadrats \ species \ occurs \ in}{Total \ number \ of \ quadrats} \times 100$$
 
$$Relative \ Frequency = \frac{Species \ frequency}{Total \ frequency \ of \ all \ species} \times 100$$

The number of individual plants of each species was recorded in the field, and percent cover was derived from the total number of individual plants in each quadrat sampled – for instance, if there were two purple loosestrife plants in a quadrat with 50 total plants, the # of individuals = 2 and the percent cover = 4 for purple loosestrife in that quadrat.

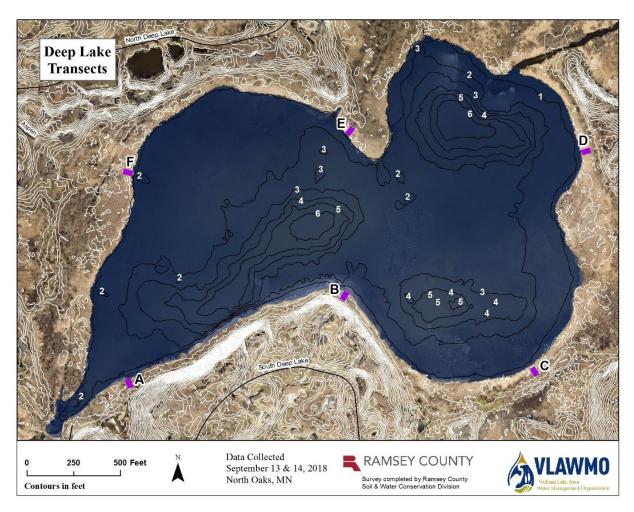


Figure 4. Transects A-F (in purple) used in the shoreline vegetation survey. Transects are evenly spaced and include the diversity of wetland classifications along the north, west, and east shores as well as the steeper, developed area in the south.

All vegetation observed and collected along the transect was identified to the lowest taxonomic level possible. All survey data was recorded in the field, except for species that were collected and labeled in the field and brought to the office for further identification.

Results per quadrat sampled can be found in Appendix B, with photos of each transect in Appendix C. The summary statistics of plant species, coverage, density, and frequency can be found in the results section below.

#### **Results:**

#### Transect-Quadrat Surveys

Tables 1 through 4 display shoreline plant species, coverage, density and frequency data as observed within N=24 one square meter quadrats sampled along six 15-meter long transects. A total of fifty-two (52) species were observed (Table 1), with Canada Bluejoint Grass (*Calamagrostis canadensis*) and Reed Canary Grass (*Phalaris arundinacea*) topping both the coverage list (Table 2) and the density list (Table 3) with the highest plant counts (over three times higher than the next most numerous species). The most widespread species across the lake – those found in 10 or greater quadrats – included Lake Sedge (*Carex lacustris*) and Canada Bluejoint (*Calamagrostis canadensis*), which top the frequency list (Table 4).

Other common species, found in 5-9 of the 24 total quadrats, included Reed Canary Grass (*Phalaris arundinacea*), Northern Marsh Fern (*Thelypteris palustris*), Purple Loosestrife (*Lythrum salicaria*), Rice Cut Grass (Leersia oryzoides), Virginia Bugleweed (*Lycopus virginicus*), Dwarf Clearweed (*Pilea Pumila*), Broad-leaf Arrowhead (*Sagittaria latifolia*), and Native Cattail (*Typha latifolia*). Species found in three or four quadrats included Bulblet-Bearing Water Hemlock (Cicuta bulbifera), Green Ash (*Fraxinus pennsylvanica*), Sensitive Fern (*Onoclea sensibilis*), Common Buckthorn (*Thamnus cathartica*), and Virginia Creeper (*Parthenocissus quinquefolia*). The remaining 37 species were found in only 1 or 2 quadrats (8% or less of the sample area) and are listed in Table 1. Indicator species that were found in the shoreline area, but not within quadrat areas, include Native Phragmites and Caterpillar Sedge (*Carex crinita*).

Six invasive species are among the results of this survey (in red), listed from highest to lowest plant count below:

Scientific Name	Common Name	Tot. Plant Count
Phalaris arundinacea	Reed Canary Grass	172
Rhamnus cathartica	Common Buckthorn	16
Lythrum salicaria	Purple Loosestrife	13
Lonicera Spp.	Bush Honeysuckle	3
Salix alba	White Willow	2
Robinia pseudoacacia	Black Locust	1

As seen by the total plant count, Reed Canary Grass is the single most prevalent invasive plant detected in this survey. It out-competes most native species, spreading through rhizomes and creating a thick mat at or directly below the soil surface. The MN Department of Natural Resources promotes a guide by Reinhardt and Galatowitsch (2000) for management of reed canary grass in wetland areas, whose information can be found in the References section. One additional invasive plant, Oriental Bittersweet (*Celastrus orbiculatus*), was observed along the pedestrian trail near transect C, but not within the survey area.

Table 1
Deep Lake Shoreline Vegetation Survey Species List (invasive in red)

Scientific Name         Common Name           Acer negundo         Boxelder           Acer saccharinum         Silver maple           Ageratina altissima         White Snakeroot           Alnus incana         Speckled Alder           Boehmeria cyclindrica         Small-spike False Nettle           Calamagrostis canadensis         Canada Bluejoint           Campanula aparinoides         Marsh Bellflower           Carex lacustris         Lake Sedge           Carex lasiocarpa         Wiregrass sedge           Cicuta bulbifera         Bulblet-bearing Water Hemlock           Cornus sericea         Red Osier Dogwood           Cornus sericea         Red Osier Dogwood           Decodon verticillatus         Swamp Loosestrife           Fraxinus pennsylvanica         Green Ash           Galium labradoricum         Labrador Bedstraw           Glechoma hederacea         Creeping Charlie           Impatiens capensis         Jewelweed           Leersia oryzoides         Rice Cut Grass           Lolium multiflorem         Italian Rye Grass           Lonicera Spp.         Bush Honeysuckle           Lycopus uniflorus         Northern Bugleweed           Lysimachia thyrsiflora         Tufted Loosestrife           Lys	Deep Lake Shoreline Vegetation Survey Species List ( invasive in red )					
Acer saccharinum Ageratina altissima Alnus incana Boehmeria cyclindrica Calmagnostis canadensis Carex lacustris Lake Sedge Carex lasiocarpa Cicuta bulbifera Cornus alternifolia Canus sericea Bechmeria cyclindrica Galium labradoricum Galium multiflorem Lythrum salicaria Mainthemum racemosum Onoclea sensibilis Parthenocissus injerta Parthenocissus quinquefolia Partha salix alta Quercus rubra Rabia da Marsh Bellflower Lake Sedge Carex lasiocarpa Wiregrass sedge Cicuta bulbifera Bulblet-bearing Water Hemlock Pagoda Dogwood Cornus sericea Red Osier Dogwood Decodon verticillatus Swamp Loosestrife Fraxinus pennsylvanica Green Ash Gelium labradoricum Labrador Bedstraw Glechoma hederocea Creeping Charlie Impatiens capensis Jewelweed Leersia oryzoides Rice Cut Grass Lolium multiflorem Italian Rye Grass Lonicera Spp. Bush Honeysuckle Lycopus virginicus Virginia Bugleweed Virginia Bugleweed Lycinus solicaria Purple loosestrife Adainthemum canadense Maianthemum canadense Maianthemum racemosum False Solomon's Seal Onoclea sensibilis Sensitive Fern Parthenocissus quinquefolia Virginia Creeper Parsicaria sagittata Arrow-leaved Tearthumb Persicaria sapp. Smartweed Phalaris arundinacea Phalaris arundinacea Reed Canary Grass Pilea pumila Dwarf Clearweed Poa pratensis Kentucky Bluegrass Quercus alba White Oak Ruerus rubra Red Oak Rhamnus cathartica Robinia pseudoacacia Black Locust Rumex crispus Curlydock Sagittaria latifolia Broad-leaf Arrowhead Salix alba Salix alba White Willow Salix nade Salix aracilis Slack Willow Salix nade Salix aracilis Slack Willow Salix nade Salix aracilis Slack Willow Salix pacilis Slender Willow Slack Willow Secupus cyperinus Scutellaria lateriflora Mad Dog Skull Cap Dandelion Thalictrum dioicum Thelypteris palustris Northern Marsh Fern	Scientific Name	Common Name				
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Thalictrum dioicum Early Meadow Rue Thelypteris palustris Northern Marsh Fern	Scutellaria lateriflora	Mad Dog Skull Cap				
Thelypteris palustris Northern Marsh Fern	Taraxacum officinale	Dandelion				
	Thalictrum dioicum	Early Meadow Rue				
Typha latifolia Native Cattail	Thelypteris palustris	Northern Marsh Fern				
	Typha latifolia	Native Cattail				

Wild Grape

Vitis riparia

Table 2
Coverage of Species Present in N=24 One Square Meter Quadrats, Deep Lake Shoreline (invasive in red)

Scientific Name	Common Name	Total Coverage	Relative Coverage
Phalaris arundinacea	Reed Canary Grass	470	19.57%
Calamagrostis canadensis	Canada Bluejoint	445	18.55%
Carex lacustris	Lake Sedge	161	6.69%
raxinus pennsylvanica	Green Ash	101	4.19%
Rhamnus cathartica	Common Buckthorn	96	4.01%
Typha latifolia	Native Cattail	93	3.88%
Pilea pumila	Dwarf Clearweed	90	3.77%
Onoclea sensibilis	Sensitive Fern	80	3.35%
Poa pratensis	Kentucky Bluegrass	75	3.13%
Thelypteris palustris	Northern Marsh Fern	61	2.55%
Maianthemum canadense	Canada Mayflower	59	2.45%
eersia oryzoides	Rice Cut Grass	58	2.43%
Cicuta bulbifera	Bulblet-bearing Water He	56	2.32%
ycopus virginicus	Virginia Bugleweed	54	2.24%
Parthenocissus quinquefolia	Virginia Creeper	52	2.16%
araxacum officinale	Dandelion	47	1.96%
Glechoma hederacea	Creeping Charlie	45	1.89%
Carex lasiocarpa	Wiregrass sedge	37	1.55%
agittaria latifolia	Broad-leaf Arrowhead	30	1.24%
ythrum salicaria	Purple loosestrife	29	1.19%
Acer saccharinum	Silver maple	25	1.04%
mpatiens capensis	Jewelweed	21	0.88%
Alnus incana		20	0.83%
	Speckled Alder		
onicera Spp.	Bush Honeysuckle	19	0.80%
Pubus occidentalis	Black Raspberry	14	0.58%
Galium labradoricum	Labrador Bedstraw	12	0.51%
Maianthemum racemosum	False Solomon's Seal	12	0.49%
Ageratina altissima	White Snakeroot	12	0.49%
Cornus alternifolia	Pagoda Dogwood	11	0.47%
Cornus sericea	Red Osier Dogwood	11	0.46%
Persicaria spp.	Smartweed	11	0.46%
alix alba	White Willow	9	0.36%
itis riparia/	Wild Grape	9	0.36%
Persicaria sagittata	Arrow-leaved Tearthumb	9	0.35%
alix subsericea	Meadow Willow	8	0.35%
Quercus rubra	Red Oak	7	0.30%
alix gracilis	Slender Willow	7	0.30%
Parthenocissus inserta	Woodbine	7	0.28%
cutellaria lateriflora	Mad Dog Skull Cap	6	0.23%
Quercus alba	White Oak	5	0.20%
ycopus uniflorus	Northern Bugleweed	4	0.18%
alix nigra	Black Willow	3	0.14%
Boehmeria cyclindrica	Small-spike False Nettle	3	0.10%
Campanula aparinoides	Marsh Bellflower	3	0.10%
ecodon verticillatus	Swamp Loosestrife	2	0.09%
Rumex crispus	Curlydock	2	0.09%
olium multiflorem	Italian Rye Grass	2	0.09%
Acer negundo	Boxelder	2	0.07%
ysimachia thyrsiflora	Tufted Loosestrife	2	0.07%
Scirpus cyperinus	Woolgrass	2	0.07%
Robinia pseudoacacia	Black Locust	2	0.07%
Thalictrum dioicum	Early Meadow Rue	2	0.07%
	TOTAL	2400	100%

Table 3
Density of Species Present in N=24 One Square Meter Quadrats, Deep Lake Shoreline (invasive in red)

Calamagrastic canadem Canada Bluejoint   199   8.29   24.45%	Scientific Name	·		Density (plants/m2)	Relative Density
Pileo pumila         Dwarf Clearweed         55         2.29         6.76%           Carex locustris         Lake Sedge         50         2.08         6.14%           Poa pratensis         Kentucky Bluegrass         41         1.71         3.04%           Leersio oryzoides         Rice Cut Grass         28         1.17         3.44%           Typha latifolia         Native Cattail         24         1.00         2.95%           Froxinus pennsylvanica         Green Ash         22         0.92         2.70%           Onoclea sensibilis         Sensitive Fern         22         0.92         2.70%           Onoclea sensibilis         Sensitive Fern         21         0.88         2.58%           Cicuta bublifera         Bubliet-bearing Water Heml         17         0.71         2.098           Cicuta bublifera         Bubliet-bearing Water Heml         17         0.71         2.098           Rhamnus cathartica         Common Buckthorn         16         0.67         1.97%           Lythrum solicaria         Purple loosestiffe         13         0.54         1.60%           Lythrum solicaria         Lythrum solicaria         10         0.42         1.23%           Segitaria latifolia         B	Calamagrostis canaden	:Canada Bluejoint	199	8.29	24.45%
Pileo pumila         Dwarf Clearweed         55         2.29         6.76%           Carex locustris         Lake Sedge         50         2.08         6.14%           Poa pratensis         Kentucky Bluegrass         41         1.71         3.04%           Leersio oryzoides         Rice Cut Grass         28         1.17         3.44%           Typha latifolia         Native Cattail         24         1.00         2.95%           Froxinus pennsylvanica         Green Ash         22         0.92         2.70%           Onoclea sensibilis         Sensitive Fern         22         0.92         2.70%           Onoclea sensibilis         Sensitive Fern         21         0.88         2.58%           Cicuta bublifera         Bubliet-bearing Water Heml         17         0.71         2.098           Cicuta bublifera         Bubliet-bearing Water Heml         17         0.71         2.098           Rhamnus cathartica         Common Buckthorn         16         0.67         1.97%           Lythrum solicaria         Purple loosestiffe         13         0.54         1.60%           Lythrum solicaria         Lythrum solicaria         10         0.42         1.23%           Segitaria latifolia         B	Phalaris arundinacea	Reed Canary Grass	172	7.17	21.13%
Carex lacustris         Lake Sedge         50         2.08         6.14%           Poa pratensis         Kentucky Bluegrass         41         1.71         5.04%           Leersia oryodes         Rice Cut Grass         28         1.17         3.44%           Typoha latifola         Native Cattail         24         1.00         2.95%           Proxinus pennsylvanica         Gene Ash         22         0.92         2.70%           Onocleo sensibilis         Sensitive Fern         22         0.92         2.70%           Thelypteris palustris         Northern Marsh Fern         21         0.88         2.58%           Cicuta bublifera         Bublet-bearing Water Heml         17         0.71         2.09%           Carex lasiocarpa         Wiregrass sedge         16         0.67         1.97%           Carex lasiocara         Wiregrass sedge         16         0.67         1.97%           Carex lasiocaria         Purple loosestrife         13         0.54         1.60%           Lycopus virginicus         Virginia Bugleweed         11         0.46         1.35%           Sagiktaria latifolia         Broad-leaf Arrowhead         10         0.42         1.23%           Mainthemma canader. Canada Mayflowe	Pilea pumila		55	2.29	6.76%
Leersia oryzoides         Rice Cut Grass         28         1.17         3.44%           Typha latifolia         Native Cattail         24         1.00         2.95%           Fraxinus pennsylvanica         Gerean Ash         22         0.92         2.70%           Onaclea sensibilis         Sensitive Fern         22         0.92         2.70%           Oncelea sensibilis         Sensitive Fern         21         0.88         2.58%           Cicuta bubbiger         Mule Delea Bublet-bearing Water Heml         17         0.71         2.09%           Carex losiocarpa         Wiregrass sedge         16         0.67         1.97%           Khannus catharica         Common Buckthorn         16         0.67         1.97%           Lycopus virginicus         Virginia Bugleweed         11         0.46         1.35%           Sogittaria latifolia         Broad-leaf Arrowhead         10         0.42         1.23%           Maionthemum canader Canada Mayflower         9         0.38         1.11%           Parthenacissus quinque Virginia Creeper         8         0.33         0.98%           Toraxacum officinale         Acer saccharinum         6         0.25         0.74%           Acer saccharinum         Gollium la	•	Lake Sedge	50	2.08	6.14%
Leersia oryzoides         Rice Cut Grass         28         1.17         3.44%           Typha latifolia         Native Cattail         24         1.00         2.95%           Froxinus pennsylvanica         Green Ash         22         0.92         2.70%           Onaclea sensibilis         Sensitive Feren         22         0.92         2.70%           Onaclea sensibilis         Sensitive Feren         21         0.88         2.58%           Cicuta bubiliper         Bublet-bearing Water Heml         17         0.71         2.09%           Carex losiocarpa         Wiregrass sedge         16         0.67         1.97%           Rhammus cathartica         Common Buckthorn         16         0.67         1.97%           Lytcapus virginicus         Virginia Bugleweed         11         0.46         1.35%           Sogittaria latifolia         Broad-leaf Arrowhead         10         0.42         1.23%           Maionthemum canoder. Canada Mayflower         9         0.38         1.11%           Parthenocissus quinque Virginia Creeper         8         0.33         0.98%           Toraxacum officinale         Ancer saccharinum         6         0.25         0.74%           Acer saccharinum         Galium labrador	Poa pratensis	Kentucky Bluegrass	41	1.71	5.04%
Typha latifolia         Native Cattail         24         1.00         2.95%           Froxinus pennsylvanica Green Ash         22         0.92         2.70%           Oncolea sensibilis         Sensitive Fern         22         0.92         2.70%           Thelypteris palustris         Northern Marsh Fern         21         0.88         2.58%           Cicuta buibifera         Buiblet-bearing Water Heml         17         0.71         2.09%           Corex lasiocarpa         Wiregrass sedge         16         0.67         1.97%           Rhamnus cathartica         Common Buckthorn         16         0.67         1.97%           Lythrum salicaria         Purple loosestrife         13         0.54         1.60%           Lycopus virginicus         Virginia Bugleweed         11         0.46         1.35%           Sogittoria latifolia         Broad-leaf Arrowhead         10         0.42         1.23%           Maianthemum canader Canada Mayflower         9         0.33         0.11%           Parthenoicisus quinque Virginia Creeper         8         0.33         0.98%           Impatiens capensis         1         1.90         0.29         0.86%           Acer saccharinum         5         0.21         <	•	·	28		
Praxinus pennsylvanica   Green Ash   22   0.92   2.70%	•				
Onoclea sensibilis         Sensitive Fern         22         0.92         2.70%           Thelypteris palustris         Northern Marsh Fern         21         0.88         2.58%           Carex lasiocarpa         Wiregrass sedge         16         0.67         1.97%           Ahannus cathortica         Common Buckthorn         16         0.67         1.97%           Lycopus virginicus         Common Buckthorn         16         0.67         1.97%           Lycopus virginicus         Virginia Bugleweed         11         0.46         1.35%           Sagittaria latifolia         Broad-leaf Arrowhead         10         0.42         1.23%           Maioanthemum canader-Canada Mayflower         9         0.38         1.11%           Parthenocissus quinque Virginia Creeper         8         0.33         0.98%           Impatiens capensis         Jewellweed         7         0.29         0.86%           Taravacum officinale         Acer saccharium         6         0.25         0.74%           Acer saccharium         Silver maple         5         0.21         0.61%           Gellum labradoricum         Labrador Bedstraw         5         0.21         0.61%           Gellum labradoricum         Creeping Charlie <td></td> <td></td> <td></td> <td></td> <td></td>					
Thelypteris palustris   Northern Marsh Fern   21   0.88   2.58%					
Cicura buibifera         Bulblet-bearing Water Heml         17         0.71         2.09%           Carex kosiocarpa         Wiregrass sedge         16         0.67         1.97%           Abhamus cathartica         Wiregrass sedge         16         0.67         1.97%           Lythrum salicaria         Purple loosestrife         13         0.54         1.60%           Lytopus virginicus         Virginia Bugleweed         11         0.46         1.35%           Sagittaria latifolia         Broad-leaf Arrowhead         10         0.42         1.23%           Maionthemum canader. Canada Mayflower         9         0.38         1.11%           Parthenocissus quinque Virginia Creeper         8         0.33         0.98%           Impatiens capensis         Jewelweed         7         0.29         0.86%           Taraxacum officinale         Dandelion         6         0.25         0.74%           Acer saccharinum         Glechoma hederacea         Creeping Chartie         5         0.21         0.61%           Gleium labradoricum         Gleckhoma hederacea         Creeping Chartie         5         0.21         0.61%           Acer saccharinum         Galium labradoricum         Arrow-leaved Tearthumb         4         0.17 </td <td></td> <td></td> <td></td> <td></td> <td></td>					
Carex lasiocarpa         Wiregrass sedge         16         0.67         1.97%           Rhamnus cathartica         Common Buckthorn         16         0.67         1.97%           Lytprum salicaria         Purple Joosestrife         13         0.54         1.60%           Lycopus virginicus         Virginia Bugleweed         11         0.46         1.35%           Sagittaria latifolia         Broad-leaf Arrowhead         10         0.42         1.23%           Maianthemum canader Canada Mayflower         9         0.38         1.11%           Parthenocissus quinque Virginia Creeper         8         0.33         0.98%           Impatiens capensis         Jewelweed         7         0.29         0.86%           Impatiens capensis         Jewelweed         7         0.29					
Rhomnus cathartica   Common Buckthorn   16   0.67   1.97%   Lythrum salicaria   Purple loosestrife   13   0.54   1.60%   1.60%   1.60%   1.2		=			
Lytchrum salicaria         Purple loosestrife         13         0.54         1.60%           Lycopus virginicus         Virginia Bugleweed         11         0.46         1.35%           Sagitaria latifolia         Broad-leaf Arrowhead         10         0.42         1.23%           Maionthemum canader Canada Mayflower         9         0.38         1.11%           Parthenocissus quinque, Virginia Creeper         8         0.33         0.98%           Impatiens capensis         Jewelweed         7         0.29         0.86%           Taraxacum officinale         Dandellon         6         0.25         0.74%           Acer saccharinum         Silver maple         5         0.21         0.61%           Gelium labradoricum         Labrador Bedstraw         5         0.21         0.61%           Gellechoma hederacea         Creeping Charlie         5         0.21         0.61%           Gellechoma hederacea         Selestratile	•				
Vergous virginicus   Virginia Bugleweed   11   0.46   1.35%     Sagittaria latifolia   Broad-leaf Arrowhead   10   0.42   1.23%     Maianthemum canaden Canada Mayflower   9   0.38   1.11%     Parthenocissus quinque, Virginia Creeper   8   0.33   0.98%     Impatiens capensis   Jewelweed   7   0.29   0.86%     Impatiens capensis   Jewelweed   5   0.21   0.61%     Maianthemum racemos   Jewelweed   5   0.21   0.61%     Maianthemum racemos   False Solomon's Seal   4   0.17   0.49%     Persicaria sagittata   Arrow-leaved Tearthumb   4   0.17   0.49%     Alnus incana   Speckled Alder   3   0.13   0.37%     Alnus incana   Speckled Alder   3   0.13   0.37%     Cornus alternifolia   Pagoda Dogwood   3   0.13   0.37%     Quercus alternifolia   Pagoda Dogwood   3   0.13   0.37%     Quercus alba   White Oak   3   0.13   0.37%     Quercus alba   White Oak   3   0.13   0.37%     Quercus alba   White Oak   3   0.13   0.37%     Ageratina altissima   White Snakeroot   2   0.08   0.25%     Persicaria spp.   Smartweed   2   0.08   0.25%     Persicaria bateriflora   Wild Grape   2   0.08   0.25%     Persicaria spp.   Smartweed   1   0.04					
Sagittaria latifolia         Broad-leaf Arrowhead         10         0.42         1.23%           Maianthemum canader Canada Mayflower         9         0.38         1.11%           Parthenocissus quinque, Virginia Creeper         8         0.33         0.98%           Impatiens capenisk         Jewelweed         7         0.29         0.86%           Impatiens capenisk         Jewelweed         7         0.29         0.86%           Acer saccharinum         Silver maple         5         0.21         0.61%           Galium labradoricum         Labrador Bedstraw         5         0.21         0.61%           Glechoma hederacea         Creeping Charlie         5         0.21         0.61%           Glechoma hederacea         Creeping Charlie         5         0.21         0.61%           Maianthemum racemos False Solomon's Seal         4         0.17         0.49%           Persicaria sagittata         Arrow-leaved Tearthumb         4         0.17         0.49%           Persicaria sagittata         Arrow-leaved Tearthumb         4         0.17         0.49%           Alous incara         Speckled Alder         3         0.13         0.37%           Cornus alternifolia         Pagoda Dogwood         3					
Maianthemum canaden Canada Mayflower         9         0.38         1.11%           Parthenocissus quinque, Virginia Creeper         8         0.33         0.98%           Impatiens capensis         Jewelweed         7         0.29         0.86%           Iraraxacum officinale         Dandelion         6         0.25         0.74%           Acer saccharinum         Silver maple         5         0.21         0.61%           Galium labradoricum         Labrador Bedstraw         5         0.21         0.61%           Glechoma hederacea         Creeping Charlie         5         0.21         0.61%           Maianthemum racemos False Solomon's Seal         4         0.17         0.49%           Persicaria sagittata         Arrow-leaved Tearthumb         4         0.17         0.49%           Alnus incana         Speckled Alder         3         0.13         0.37%           Cornus alternifola         Pagoda Dogwood         3         0.13         0.37%           Alnus incana         Speckled Alder         3         0.13         0.37%           Acuricera Spp.         Bush Honeysuckle         3         0.13         0.37%           Acuricera Spp.         Bush Honeysuckle         3         0.13		•			
Parthenocissus quinque, Virginia Creeper   8	= -				
Impatiens capensis   Jewelweed   7		·			
Taraxacum officinale         Dandelion         6         0.25         0.74%           Acer saccharinum         Silver maple         5         0.21         0.61%           Galium labradoricum         Labrador Bedstraw         5         0.21         0.61%           Glechoma hederacea         Creeping Charlie         5         0.21         0.61%           Maianthemum racemos False Solomon's Seal         4         0.17         0.49%           Persicaria sagittata         Arrow-leaved Tearthumb         4         0.17         0.49%           Alnus incana         Speckled Alder         3         0.13         0.37%           Cornus alternifolia         Pagoda Dogwood         3         0.13         0.37%           Lonicera Spp.         Bush Honeysuckle         3         0.13         0.37%           Quercus alba         White Oak         3         0.13         0.37%           Scutellaria lateriflora         Mad Dog Skull Cap         3         0.13         0.37%           Ageratina altissima         White Saakeroot         2         0.08         0.25%           Cornus sericea         Red Osier Dogwood         2         0.08         0.25%           Persicaria spp.         Smartweed         2		• •			
Acer saccharinum	•				
Galium labradoricum         Labrador Bedstraw         5         0.21         0.61%           Glechoma hederacea         Creeping Charlie         5         0.21         0.61%           Malanthemum racemos False Solomon's Seal         4         0.17         0.49%           Persicaria sagittata         Arrow-leaved Tearthumb         4         0.17         0.49%           Alnus incana         Speckled Alder         3         0.13         0.37%           Cornus alternifolia         Pagoda Dogwood         3         0.13         0.37%           Cornus alternifora         Mad Dog Skull Cap         3         0.13         0.37%           Quercus alba         White Oak         3         0.13         0.37%           Ageratina alteriflora         Mad Dog Skull Cap         3         0.13         0.37%           Ageratina altissima         White Snakeroot         2         0.08         0.25%           Cornus sericea         Red Osier Dogwood         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Rabias alba         White Willow         2 <t< td=""><td></td><td></td><td></td><td></td><td></td></t<>					
Glechoma hederacea         Creeping Charlie         5         0.21         0.61%           Maianthemum racemos False Solomon's Seal         4         0.17         0.49%           Persicaria sagittata         Arrow-leaved Tearthumb         4         0.17         0.49%           Alnus incana         Speckled Alder         3         0.13         0.37%           Cornus alternifolia         Pagoda Dogwood         3         0.13         0.37%           Lonicera Spp.         Bush Honeysuckle         3         0.13         0.37%           Quercus alba         White Oak         3         0.13         0.37%           Scutellaria lateriflora         Mad Dog Skull Cap         3         0.13         0.37%           Ageratina altissima         White Snakeroot         2         0.08         0.25%           Cornus sericea         Red Osier Dogwood         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Salix alba         White Willow         2         0.08         0.25%           Salix subsericea         Meadow Willow         2         0.08		•			
Maianthemum racemos False Solomon's Seal         4         0.17         0.49%           Persicaria sagittata         Arrow-leaved Tearthumb         4         0.17         0.49%           Alnus incana         Speckled Alder         3         0.13         0.37%           Cornus alternifolia         Pagoda Dogwood         3         0.13         0.37%           Lonicera Spp.         Bush Honeysuckle         3         0.13         0.37%           Lonicera Spp.         Bush Honeysuckle         3         0.13         0.37%           Quercus alba         White Oak         3         0.13         0.37%           Ageratina altissima         White Oak         3         0.13         0.37%           Ageratina altissima         White Snakeroot         2         0.08         0.25%           Cornus sericea         Red Osier Dogwood         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Rubus occidentalis         Black Raspberry         2         0.08         0.25%           Salix alba         White Willow         2         0.08         0.25%           Salix subsericea         Meadow Willow         2         0.08					
Persicaria sagittata         Arrow-leaved Tearthumb         4         0.17         0.49%           Alnus incana         Speckled Alder         3         0.13         0.37%           Cornus alternifolia         Pagoda Dogwood         3         0.13         0.37%           Lonicera Spp.         Bush Honeysuckle         3         0.13         0.37%           Quercus alba         White Oak         3         0.13         0.37%           Scuttellaria lateriflora         Mad Dog Skull Cap         3         0.13         0.37%           Ageratina altissima         White Snakeroot         2         0.08         0.25%           Cornus sericea         Red Osier Dogwood         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Rubus occidentalis         Black Raspberry         2         0.08         0.25%           Salix alba         White Willow         2         0.08         0.25%           Sealix argaria         Wild Grape         2         0.08					
Alnus incana         Speckled Alder         3         0.13         0.37%           Cornus alternifolia         Pagoda Dogwood         3         0.13         0.37%           Lonicera Spp.         Bush Honeysuckle         3         0.13         0.37%           Quercus alba         White Oak         3         0.13         0.37%           Scutellaria lateriflora         Mad Dog Skull Cap         3         0.13         0.37%           Ageratina altissima         White Snakeroot         2         0.08         0.25%           Cornus sericea         Red Osier Dogwood         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Rubus occidentalis         Black Raspberry         2         0.08         0.25%           Salix alba         White Willow         2         0.08         0.25%           Salix subsericea         Meadow Willow         2         0.08         0.25%           Vitis riparia         Wild Grape         2         0.08         0.25%           Acer negundo         Boxelder         1         0.04         0.12%					
Cornus alternifolia         Pagoda Dogwood         3         0.13         0.37%           Lonicera Spp.         Bush Honeysuckle         3         0.13         0.37%           Quercus alba         White Oak         3         0.13         0.37%           Scutellaria lateriflora         Mad Dog Skull Cap         3         0.13         0.37%           Ageratina altissima         White Snakeroot         2         0.08         0.25%           Cornus sericea         Red Osier Dogwood         2         0.08         0.25%           Rubus occidentalis         Black Raspberry         2         0.08         0.25%           Rubus occidentalis         Black Raspberry         2         0.08         0.25%           Salix alba         White Willow         2         0.08         0.25%           Salix subsericea         Meadow Willow         2         0.08         0.25%           Acer negunda         Boxelder         1         0.0	_				
Lonicera Spp.         Bush Honeysuckle         3         0.13         0.37%           Quercus alba         White Oak         3         0.13         0.37%           Scutellaria lateriflora         Mad Dog Skull Cap         3         0.13         0.37%           Ageratina altissima         White Snakeroot         2         0.08         0.25%           Cornus sericea         Red Osier Dogwood         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Rubus occidentalis         Black Raspberry         2         0.08         0.25%           Rubus occidentalis         Black Raspberry         2         0.08         0.25%           Salix subsericea         Meadow Willow         2         0.08         0.25%           Salix subsericea         Meadow Willow         2         0.08         0.25%           Vitis riparia         Wild Grape         2         0.08         0.25%           Acer negundo         Boxelder         1         0.04         0.12%           Boehmeria cyclindrica         Small-spike False Nettle         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1		•	3	0.13	0.37%
Quercus alba         White Oak         3         0.13         0.37%           Scutellaria lateriflora         Mad Dog Skull Cap         3         0.13         0.37%           Ageratina altissima         White Snakeroot         2         0.08         0.25%           Cornus sericea         Red Osier Dogwood         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Rubus occidentalis         Black Raspberry         2         0.08         0.25%           Salix alba         White Willow         2         0.08         0.25%           Salix subsericea         Meadow Willow         2         0.08         0.25%           Vitis riparia         Wild Grape         2         0.08         0.25%           Acer negundo         Boxelder         1         0.04         0.12%           Acer negundo         Boxelder         1         0.04         0.12%           Boehmeria cyclindrica         Small-spike False Nettle         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Lolium multiflorem         Italian Rye Grass         1         0.04 <td>Cornus alternifolia</td> <td>Pagoda Dogwood</td> <td>3</td> <td></td> <td>0.37%</td>	Cornus alternifolia	Pagoda Dogwood	3		0.37%
Scutellaria lateriflora         Mad Dog Skull Cap         3         0.13         0.37%           Ageratina altissima         White Snakeroot         2         0.08         0.25%           Cornus sericea         Red Osier Dogwood         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Rubus occidentalis         Black Raspberry         2         0.08         0.25%           Salix alba         White Willow         2         0.08         0.25%           Salix subsericea         Meadow Willow         2         0.08         0.25%           Vitis riparia         Wild Grape         2         0.08         0.25%           Acer negundo         Boxelder         1         0.04         0.12%           Boehmeria cyclindrica         Small-spike False Nettle         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Lycipus uniflorus         Northern Buglewed	Lonicera Spp.	Bush Honeysuckle	3	0.13	0.37%
Ageratina altissima         White Snakeroot         2         0.08         0.25%           Cornus sericea         Red Osier Dogwood         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Rubus occidentalis         Black Raspberry         2         0.08         0.25%           Salix alba         White Willow         2         0.08         0.25%           Salix subsericea         Meadow Willow         2         0.08         0.25%           Vitis riparia         Wild Grape         2         0.08         0.25%           Acer negundo         Boxelder         1         0.04         0.12%           Boehmeria cyclindrica         Small-spike False Nettle         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Lolium multiflorem         Italian Rye Grass         1         0.04         0.12%           Lycopus uniflorus         Northern Bugleweed         1         0.04         0.12%           Lysimachia thyrsiflora         Tufed Loosestrife	Quercus alba	White Oak	3	0.13	0.37%
Cornus sericea         Red Osier Dogwood         2         0.08         0.25%           Persicaria spp.         Smartweed         2         0.08         0.25%           Rubus occidentalis         Black Raspberry         2         0.08         0.25%           Salix alba         White Willow         2         0.08         0.25%           Salix subsericea         Meadow Willow         2         0.08         0.25%           Vitis riparia         Wild Grape         2         0.08         0.25%           Acer negundo         Boxelder         1         0.04         0.12%           Boehmeria cyclindrica         Small-spike False Nettle         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Lolium multiflorem         Italian Rye Grass         1         0.04         0.12%           Lycopus uniflorus         Northern Bugleweed         1         0.04         0.12%           Parthenocissus inserta         Woodbine         1	Scutellaria lateriflora	Mad Dog Skull Cap	3	0.13	0.37%
Persicaria spp.         Smartweed         2         0.08         0.25%           Rubus occidentalis         Black Raspberry         2         0.08         0.25%           Salix alba         White Willow         2         0.08         0.25%           Salix subsericea         Meadow Willow         2         0.08         0.25%           Vitis riparia         Wild Grape         2         0.08         0.25%           Acer negundo         Boxelder         1         0.04         0.12%           Boehmeria cyclindrica         Small-spike False Nettle         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Lolium multiflorem         Italian Rye Grass         1         0.04         0.12%           Lycopus uniflorus         Northern Bugleweed         1         0.04         0.12%           Lysimachia thyrsiflora         Tufted Loosestrife         1         0.04         0.12%           Parthenocissus inserta         Woodbine	Ageratina altissima	White Snakeroot	2	0.08	0.25%
Rubus occidentalis         Black Raspberry         2         0.08         0.25%           Salix alba         White Willow         2         0.08         0.25%           Salix subsericea         Meadow Willow         2         0.08         0.25%           Vitis riparia         Wild Grape         2         0.08         0.25%           Acer negundo         Boxelder         1         0.04         0.12%           Boehmeria cyclindrica         Small-spike False Nettle         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Lolium multiflorem         Italian Rye Grass         1         0.04         0.12%           Lycopus uniflorus         Northern Bugleweed         1         0.04         0.12%           Lycipus uniflorus         Northern Bugleweed         1         0.04         0.12%           Parthenocissus inserta         Woodbine<	Cornus sericea	Red Osier Dogwood	2	0.08	0.25%
Salix alba         White Willow         2         0.08         0.25%           Salix subsericea         Meadow Willow         2         0.08         0.25%           Vitis riparia         Wild Grape         2         0.08         0.25%           Acer negundo         Boxelder         1         0.04         0.12%           Boehmeria cyclindrica         Small-spike False Nettle         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Lolium multiflorem         Italian Rye Grass         1         0.04         0.12%           Lycopus uniflorus         Northern Bugleweed         1         0.04         0.12%           Lysimachia thyrsiflora         Tufted Loosestrife         1         0.04         0.12%           Parthenocissus inserta         Woodbine         1         0.04         0.12%           Quercus rubra         Red Oak         1         0.04         0.12%           Robinia pseudoacacia         Black Locust	Persicaria spp.	Smartweed	2	0.08	0.25%
Salix subsericea         Meadow Willow         2         0.08         0.25%           Vitis riparia         Wild Grape         2         0.08         0.25%           Acer negundo         Boxelder         1         0.04         0.12%           Boehmeria cyclindrica         Small-spike False Nettle         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Lolium multiflorem         Italian Rye Grass         1         0.04         0.12%           Lycopus uniflorus         Northern Bugleweed         1         0.04         0.12%           Lysimachia thyrsiflora         Tufted Loosestrife         1         0.04         0.12%           Parthenocissus inserta         Woodbine         1         0.04         0.12%           Quercus rubra         Red Oak         1         0.04         0.12%           Robinia pseudoacacia         Black Locust         1         0.04         0.12%           Salix gracilis         Slender Willow	Rubus occidentalis	Black Raspberry	2	0.08	0.25%
Vitis riparia         Wild Grape         2         0.08         0.25%           Acer negundo         Boxelder         1         0.04         0.12%           Boehmeria cyclindrica         Small-spike False Nettle         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Lolium multiflorem         Italian Rye Grass         1         0.04         0.12%           Lycopus uniflorus         Northern Bugleweed         1         0.04         0.12%           Lysimachia thyrsiflora         Tufted Loosestrife         1         0.04         0.12%           Parthenocissus inserta         Woodbine         1         0.04         0.12%           Quercus rubra         Red Oak         1         0.04         0.12%           Robinia pseudoacacia         Black Locust         1         0.04         0.12%           Robinia pseudoacacia         Black Locust         1         0.04         0.12%           Salix gracilis         Slender Willow         1         0.04         0.12%           Salix nigra         Black Willow         1<	Salix alba	White Willow	2	0.08	0.25%
Acer negundo         Boxelder         1         0.04         0.12%           Boehmeria cyclindrica         Small-spike False Nettle         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Lolium multiflorem         Italian Rye Grass         1         0.04         0.12%           Lycopus uniflorus         Northern Bugleweed         1         0.04         0.12%           Lysimachia thyrsiflora         Tufted Loosestrife         1         0.04         0.12%           Parthenocissus inserta         Woodbine         1         0.04         0.12%           Quercus rubra         Red Oak         1         0.04         0.12%           Robinia pseudoacacia         Black Locust         1         0.04         0.12%           Rumex crispus         Curlydock         1         0.04         0.12%           Salix gracilis         Slender Willow         1         0.04         0.12%           Salix nigra         Black Willow         1         0.04         0.12%           Scirpus cyperinus         Woolgrass         1	Salix subsericea	Meadow Willow	2	0.08	0.25%
Acer negundo         Boxelder         1         0.04         0.12%           Boehmeria cyclindrica         Small-spike False Nettle         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Lolium multiflorem         Italian Rye Grass         1         0.04         0.12%           Lycopus uniflorus         Northern Bugleweed         1         0.04         0.12%           Lysimachia thyrsiflora         Tufted Loosestrife         1         0.04         0.12%           Parthenocissus inserta         Woodbine         1         0.04         0.12%           Quercus rubra         Red Oak         1         0.04         0.12%           Robinia pseudoacacia         Black Locust         1         0.04         0.12%           Rumex crispus         Curlydock         1         0.04         0.12%           Salix gracilis         Slender Willow         1         0.04         0.12%           Salix nigra         Black Willow         1         0.04         0.12%           Scirpus cyperinus         Woolgrass         1	Vitis riparia	Wild Grape	2	0.08	0.25%
Boehmeria cyclindrica         Small-spike False Nettle         1         0.04         0.12%           Campanula aparinoides         Marsh Bellflower         1         0.04         0.12%           Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Lolium multiflorem         Italian Rye Grass         1         0.04         0.12%           Lycopus uniflorus         Northern Bugleweed         1         0.04         0.12%           Lysimachia thyrsiflora         Tufted Loosestrife         1         0.04         0.12%           Parthenocissus inserta         Woodbine         1         0.04         0.12%           Quercus rubra         Red Oak         1         0.04         0.12%           Robinia pseudoacacia         Black Locust         1         0.04         0.12%           Rumex crispus         Curlydock         1         0.04         0.12%           Salix gracilis         Slender Willow         1         0.04         0.12%           Salix nigra         Black Willow         1         0.04         0.12%           Scirpus cyperinus         Woolgrass         1         0.04         0.12%           Thalictrum dioicum         Early Meadow Rue		·			
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Decodon verticillatus         Swamp Loosestrife         1         0.04         0.12%           Lolium multiflorem         Italian Rye Grass         1         0.04         0.12%           Lycopus uniflorus         Northern Bugleweed         1         0.04         0.12%           Lysimachia thyrsiflora         Tufted Loosestrife         1         0.04         0.12%           Parthenocissus inserta         Woodbine         1         0.04         0.12%           Quercus rubra         Red Oak         1         0.04         0.12%           Robinia pseudoacacia         Black Locust         1         0.04         0.12%           Rumex crispus         Curlydock         1         0.04         0.12%           Salix gracilis         Slender Willow         1         0.04         0.12%           Salix nigra         Black Willow         1         0.04         0.12%           Scirpus cyperinus         Woolgrass         1         0.04         0.12%           Thalictrum dioicum         Early Meadow Rue         1         0.04         0.12%	· · · · · · · · · · · · · · · · · · ·	•			
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Lycopus uniflorus         Northern Bugleweed         1         0.04         0.12%           Lysimachia thyrsiflora         Tufted Loosestrife         1         0.04         0.12%           Parthenocissus inserta         Woodbine         1         0.04         0.12%           Quercus rubra         Red Oak         1         0.04         0.12%           Robinia pseudoacacia         Black Locust         1         0.04         0.12%           Rumex crispus         Curlydock         1         0.04         0.12%           Salix gracilis         Slender Willow         1         0.04         0.12%           Salix nigra         Black Willow         1         0.04         0.12%           Scirpus cyperinus         Woolgrass         1         0.04         0.12%           Thalictrum dioicum         Early Meadow Rue         1         0.04         0.12%		•			
Lysimachia thyrsiflora         Tufted Loosestrife         1         0.04         0.12%           Parthenocissus inserta         Woodbine         1         0.04         0.12%           Quercus rubra         Red Oak         1         0.04         0.12%           Robinia pseudoacacia         Black Locust         1         0.04         0.12%           Rumex crispus         Curlydock         1         0.04         0.12%           Salix gracilis         Slender Willow         1         0.04         0.12%           Salix nigra         Black Willow         1         0.04         0.12%           Scirpus cyperinus         Woolgrass         1         0.04         0.12%           Thalictrum dioicum         Early Meadow Rue         1         0.04         0.12%	-	•			
Parthenocissus inserta         Woodbine         1         0.04         0.12%           Quercus rubra         Red Oak         1         0.04         0.12%           Robinia pseudoacacia         Black Locust         1         0.04         0.12%           Rumex crispus         Curlydock         1         0.04         0.12%           Salix gracilis         Slender Willow         1         0.04         0.12%           Salix nigra         Black Willow         1         0.04         0.12%           Scirpus cyperinus         Woolgrass         1         0.04         0.12%           Thalictrum dioicum         Early Meadow Rue         1         0.04         0.12%		•			
Quercus rubra         Red Oak         1         0.04         0.12%           Robinia pseudoacacia         Black Locust         1         0.04         0.12%           Rumex crispus         Curlydock         1         0.04         0.12%           Salix gracilis         Slender Willow         1         0.04         0.12%           Salix nigra         Black Willow         1         0.04         0.12%           Scirpus cyperinus         Woolgrass         1         0.04         0.12%           Thalictrum dioicum         Early Meadow Rue         1         0.04         0.12%					
Robinia pseudoacacia         Black Locust         1         0.04         0.12%           Rumex crispus         Curlydock         1         0.04         0.12%           Salix gracilis         Slender Willow         1         0.04         0.12%           Salix nigra         Black Willow         1         0.04         0.12%           Scirpus cyperinus         Woolgrass         1         0.04         0.12%           Thalictrum dioicum         Early Meadow Rue         1         0.04         0.12%					
Rumex crispus         Curlydock         1         0.04         0.12%           Salix gracilis         Slender Willow         1         0.04         0.12%           Salix nigra         Black Willow         1         0.04         0.12%           Scirpus cyperinus         Woolgrass         1         0.04         0.12%           Thalictrum dioicum         Early Meadow Rue         1         0.04         0.12%					
Salix gracilis         Slender Willow         1         0.04         0.12%           Salix nigra         Black Willow         1         0.04         0.12%           Scirpus cyperinus         Woolgrass         1         0.04         0.12%           Thalictrum dioicum         Early Meadow Rue         1         0.04         0.12%					
Salix nigraBlack Willow10.040.12%Scirpus cyperinusWoolgrass10.040.12%Thalictrum dioicumEarly Meadow Rue10.040.12%	· ·	•			
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Thalictrum dioicum Early Meadow Rue 1 0.04 0.12%	=				
		_			
TOTAL 814 33.92 100%	i nalictrum dioicum	Early Meadow Rue TOTAL	1 <b>814</b>	0.04 <b>33.92</b>	

Table 4
Frequency of Species Present in N=24 One Square Meter Quadrats, Deep Lake Shoreline (invasive in red)

Frequency of Species Present in N=24 Scientific Name	Common Name	# Quadrats		Relative Frequency (%)
Calamagrostis canadensis	Canada Bluejoint	11	45.83	8.09
Carex lacustris	Lake Sedge	10	41.67	7.35
Phalaris arundinacea	Reed Canary Grass	9	37.50	6.62
Thelypteris palustris	Northern Marsh Fern	7	29.17	5.15
Lythrum salicaria	Purple loosestrife	6	25.00	4.41
Leersia oryzoides	Rice Cut Grass	5	20.83	3.68
Lycopus virginicus	Virginia Bugleweed	5	20.83	3.68
Pilea pumila	Dwarf Clearweed	5	20.83	3.68
Sagittaria latifolia	Broad-leaf Arrowhead	5	20.83	3.68
Typha latifolia	Native Cattail	5	20.83	3.68
Cicuta bulbifera	Bulblet-bearing Water Hemlock	4	16.67	2.94
Fraxinus pennsylvanica	Green Ash	4	16.67	2.94
Onoclea sensibilis	Sensitive Fern	4	16.67	2.94
Rhamnus cathartica	Common Buckthorn	4	16.67	2.94
Parthenocissus quinquefolia	Virginia Creeper	3	12.50	2.21
Ageratina altissima	White Snakeroot	2	8.33	1.47
Cornus sericea	Red Osier Dogwood	2	8.33	1.47
Galium labradoricum	Labrador Bedstraw	2	8.33	1.47
Impatiens capensis	Jewelweed	2	8.33	1.47
Lonicera Spp.	Bush Honeysuckle	2	8.33	1.47
Maianthemum canadense	Canada Mayflower	2	8.33	1.47
Maianthemum racemosum	False Solomon's Seal	2	8.33	1.47
	Kentucky Bluegrass	2	8.33	1.47
Poa pratensis				
Rubus occidentalis	Black Raspberry	2	8.33	1.47
Salix subsericea (Syn. Salix petiolaris)		2	8.33	1.47
Scutellaria lateriflora	Mad Dog Skull Cap		8.33	1.47
Taraxacum officinale	Dandelion	2	8.33	1.47
Acernegundo	Boxelder	1	4.17	0.74
Acer saccharinum	Silver maple	1	4.17	0.74
Alnus incana	Speckled Alder	1	4.17	0.74
Boehmeria cyclindrica	Small-spike False Nettle	1	4.17	0.74
Campanula aparinoides	Marsh Bellflower	1	4.17	0.74
Carex lasiocarpa	Wiregrass sedge	1	4.17	0.74
Cornus alternifolia	Pagoda Dogwood	1	4.17	0.74
Decodon verticillatus	Swamp Loosestrife	1	4.17	0.74
Glechoma hederacea	Creeping Charlie	1	4.17	0.74
Lolium multiflorem	Italian Rye Grass	1	4.17	0.74
Lycopus uniflorus	Northern Bugleweed	1	4.17	0.74
Lysimachia thyrsiflora	Tufted Loosestrife	1	4.17	0.74
Parthenocissus inserta	Woodbine	1	4.17	0.74
Persicaria sagittata	Arrow-leaved Tearthumb	1	4.17	0.74
Persicaria spp.	Smartweed	1	4.17	0.74
Quercus alba	White Oak	1	4.17	0.74
Quercus rubra	Red Oak	1	4.17	0.74
Robinia pseudoacacia	Black Locust	1	4.17	0.74
Rumex crispus	Curlydock	1	4.17	0.74
Salix alba	White Willow	1	4.17	0.74
Salix gracilis	Slender Willow	1	4.17	0.74
Salix nigra	Black Willow	1	4.17	0.74
Scirpus cyperinus	Woolgrass	1	4.17	0.74
Thalictrum dioicum	Early Meadow Rue	1	4.17	0.74
Vitis riparia	Wild Grape	1	4.17	0.74
	TOTAL	. 136.00	566.67	100.00

#### REFERENCES

Barbour, M.G., J.H. Burk, and W.D. Pitts. Terrestrial Plant Ecology. Chapter 9: Method of sampling the plant community. Menlo Park, CA: Benjamin/Cummings Publishing Co.; 1987.

Cowardin, L., V. Carter, F. Golet, and E. LaRoe. (1979). Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service. December 1979.

Cox, G. Laboratory manual of general ecology 6th Ed. Dubuque, Iowa: William C. Brown; 1990.

Curtis, J. & McIntosh, R. (1950). The interrelations of certain analytic and synthetic phytosociological characteristics. *Ecology* 31:434-455.

Goldsmith, F.B., C.M. Harrison, and A.J. Morton. (1986). Description and analysis of vegetation. Pages 437-524 in P.D. Moore and S.B. Chapman, editors. Methods in plant ecology. Blackwell Scientific Publications, Oxford, England.

Minnesota Department of Natural Resources Ecological Land Classification Program (MN DNR ELC). (2005). *Field guide to native plant communities: eastern broadleaf forest province.* St. Paul, MN: University of Minnesota Press.

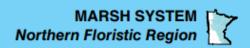
Minnesota Department of Natural Resources (MN DNR). (2014). MNDNR Native Plant Communities. Shapefile published 7/11/2014 and retrieved from Minnesota Geospatial Commons in January 2018.

Reinhardt, C and Galatowitsch, S. (2000). Best management practices for minimizing reed canary grass prior to wetland restoration. Final report to Minnesota Dept. of Natural Resources, Ramsey Washington Metro Watershed District and Minnesota Dept. of Transportation. Dec. 5, 2000. 40 pp.

#### Appendix A: MRn83 Northern Mixed Emergent/Cattail Marsh

Source: MNDNR: <a href="https://files.dnr.state.mn.us/natural\_resources/npc/marsh/mrn83.pdf">https://files.dnr.state.mn.us/natural\_resources/npc/marsh/mrn83.pdf</a>

## MRn83



#### Northern Mixed Cattail Marsh

Emergent marsh communities, typically dominated by cattails. Present on floating mats along shorelines in lakes, ponds, and river backwaters or rooted in mineral soil in shallow wetland basins.

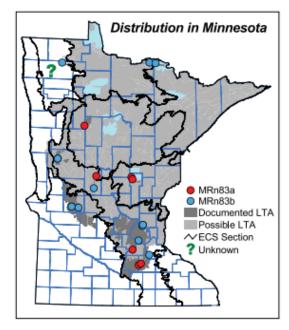
#### Vegetation Structure & Composition

Description is based on summary of field survey records and vascular plant data from 22 plots (relevés).

- Floating-leaved and submergent aquatic plant cover is sparse, with species such as duckweed (Lemna spp.) and greater duckweed (Spirodela polyrhiza) frequent, and common bladderwort (Utricularia vulgaris) and common coontail (Ceratophyllum demersum) occasionally present. Seasonally prolific, floating clones of the liverworts Riccia fluitans and Ricciocarpos natans may be present, becoming stranded during watertable drawdown.
- **Graminoid** cover is variable, with lake sedge (*Carex lacustris*) and bristly sedge (*C. comosa*) commonly present.
- Forb cover is strongly dominated by cattails

(Typha spp.), usually with > 50% cover. Other common forbs include emergent species such as broad-leaved arrowhead (Sagittaria latifolia), marsh skullcap (Scutellaria galericulata), small or three-cleft bedstraw (Galium tinctorium or G. trifidum), and bur marigold and beggarticks (Bidens spp.).

- Shrubs are absent or very sparse.
- Notes: Vegetation is often composed of dense stands of cattails interspersed with pools of open water. Associated species are highly variable. MRn83 and other shallow-water wetlands throughout much of the state (particularly the agricultural region) have been invaded by dense stands of the non-native species narrow-leaved cattail (*Typha angustifolia*) and hybrid cattail (*T. x glauca*). Invasion and dominance of marshes by non-native cattail species is likely related to alterations in wetland hydrology, commonly from drain tiling, ditching, and impoundments; high levels of nutrient-rich runoff from agricultural fields; and salt-containing runoff from roads. Marshes dominated by non-native cattail species are considered to be low-quality or disturbed examples of MRn83. Marshes dominated by the native species broad-leaved cattail (*T. latifolia*) are considered higher-quality examples of MRn83 and are increasingly rare in Minnesota.



#### Landscape Setting & Soils

MRn83 occurs in shallow basins and depressions and along the shores of lakes, ponds, and river backwaters. Substrates range from muck or shallow, well-decomposed peat to floating peaty mats. Substrate surface is usually covered with plant litter, especially dead cattail stalks. MRn83 is often transitional between shallow aquatic communities and wet meadows.

#### **Natural History**

MRn83 develops in areas where standing water is present most of the year, providing conditions favorable for hydrophytic plants. Occurrences of the community with plants rooted in muck or peat substrates may succeed to shallow aquatic communities if the water table rises for prolonged periods, or to wet meadows if the water table drops or if silt or sedimentary peat accumulation causes the substrate surface to become elevated above the water surface. Floating mats, which rise and fall with changes in water level, are presumably successionally stable but may be fragmented by strong winds or beaver activity. Variation in species composition observed in the class is likely due to differences in water depth, the permanence of standing water, and variation in substrate. Fires during severe droughts can remove accumulated peat in fens or wet meadows, effectively lowering the growing surface and creating the wetter conditions that favor marsh over fen or wet meadow vegetation.

MRn83 Northern Mixed Cattail Marsh - Species Frequency & Cover

	freq%	cover		freq%	cover
Grasses & Sedges			Unbranched bur reed (Sparganium emersum)	9	•
Lake sedge (Carex lacustris)	45	•••	Emergent Forbs		
Bristly sedge (Carex comosa)	41	••	Broad-leaved arrowhead (Sagittaria latifolia)	64	•
Red-stalked spikerush (Eleocharis palustris)	32	•	Marsh skullcap (Scutellaria galericulata)	64	•
Bluejoint (Calamagrostis canadensis)	27	•••	Three-cleft or small bedstraw (Galium trifidum or G. tinctorium)	59	•
Rice cut grass (Leersia oryzoides)	23	•	Bur marigold and Beggarticks (Bidens spp.)	50	•
Tall manna grass (Glyceria grandis)	23	•	Tufted loosestrife (Lysimachia thyrsiflora)	45	•
Soft stem bulrush (Scirpus validus)	18	••	Bulb-bearing water hemlock (Cicuta bulbifera)	41	••
Fen wiregrass sedge (Carex lasiocarpa)	14	•	Great water dock (Rumex orbiculatus)	41	•
Wild rice (Zizania palustris)	14	••	Marsh bellflower (Campanula aparinoides)	41	•
Common reed grass (Phragmites australis)	14	•	Clearweed (Pilea spp.)	36	•
Tussock sedge (Carex stricta)	14	•	Northern bugleweed (Lycopus uniflorus)	32	•
Cyperus sedge (Carex pseudocyperus)	14	••	Broad-leaved cattail (Typha latifolia)	32	••••
River bulrush (Scirpus fluviatilis)	14	••	Touch-me-not (Impatiens spp.)	32	•
Beaked sedge (Carex utriculata)	14	••	Giant bur reed (Sparganium eurycarpum)	27	•••
Ovoid spikerush (Eleocharis ovata)	9	•	Water parsnip (Sium suave)	27	•
Lesser-panicled sedge (Carex diandra)	9	•	Linear-leaved, Marsh, or Downy willow-herb*	23	•
Aquatic sedge (Carex aquatilis)	9	••	Spotted water hemlock (Cicuta maculata)	23	•
Fragrant cyperus (Cyperus odoratus)	9	•	Dotted smartweed (Polygonum punctatum)	18	•
Porcupine sedge (Carex hystericina)	9	••	Sweet flag (Acorus calamus)	18	•••
Woolgrass (Scirpus cyperinus)	9	•	Swamp milkweed (Asclepias incarnata)	18	•
Floating-Leaved & Submergent Forbs			Northern marsh fern (Thelypteris palustris)	18	•
Star-duckweed (Lemna trisculata)	64	••	Cut-leaved bugleweed (Lycopus americanus)	18	•
Lesser-duckweed (Lemna minor)	59	••	Marsh cinquefoil (Potentilla palustris)	14	•
Greater duckweed (Spirodela polyrhiza)	55	•	Spotted Joe pye weed (Eupatorium maculatum)	14	•
Common bladderwort (Utricularia vulgaris)	45	••	Marsh horsetail (Equisetum palustre)	9	•
Common coontail (Ceratophyllum demersum)	36	••	Common mint (Mentha arvensis)	9	•
Water smartweed (Polygonum amphibium)	32	•	Stinging nettle (Urtica dioica)	9	•
Flat-stemmed pondweed (Potamogeton zosteriformis)	14	•	Nodding smartweed (Polygonum lapathifolium)	9	•
Common white water-lily (Nymphaea odorata)	14	•	Lady's thumb (Polygonum persicaria)	9	•
Straight-leaved pondweed (Potamogeton strictifolius)	9	•	Common water plantain (Alisma triviale)	5	•
Intermediate bladderwort (Utricularia intermedia)	9	•	Shrubs		
Yellow pond lily (Nuphar variegata)	9	•	Red-osier dogwood (Cornus sericea)	9	••

<sup>\*</sup>Linear-leaved, Marsh, or Downy willow-herb (Epilobium leptophyllum, E. palustre, or E. strictum)

Appendix B: Field Data Results by Quadrat

Transect	Quadrat (m from water)	Species (Common name)	Species (Latin name)	# Individuals	% Cover
		Bush Honeysuckle	Lonicera Spp.	2	13%
		Black Raspberry	Rubus occidentalis	1	7%
		Woodbine	Parthenocissus inserta	1	7%
	15	Common Buckthorn	Rhamnus cathartica	4	27%
		Speckled Alder	Alnus incana	3	20%
		Virginia Creeper	Parthenocissus quinquefolia	3	20%
		Black Raspberry Rubus occidentalis 1 77 Noodbine Parthenocissus inserta 1 77 Noodbine Parthenocissus quinquefolia 3 20 Nirginia Creeper Parthenocissus quinquefolia 3 20 Noodbine Parthenocissus quinquefolia 3 20 Noodbine Parthenocissus quinquefolia 3 20 Noodbine Parthenocissus quinquefolia 3 20 Note Oak Quercus rubra 1 77 Noted Oak Quercus rubra 1 77 Noted Oak Quercus rubra 1 77 Noted Oak Quercus rubra 1 77 Note Oak Quercus rubra 1 78 Nood Oak Quer	7%		
		Red Oak	Quercus rubra	1	7%
		Black Raspberry	Rubus occidentalis	1	7%
	10	Slender Willow	Salix gracilis	1	7%
A	10	Kentucky Bluegrass	Poa pratensis	2	14%
	Canada Mayflower Maianthemum canadense 8 False Solomon's Seal Maianthemum racemosum 1  Sensitive Fern Onoclea sensibilis 7 Virginia Creeper Parthenocissus quinquefolia 2 Virginia Bugleweed Lycopus virginicus 5  Jewelweed Impatiens capensis 6  Bulblet-bearing Water Hemlock Cicuta bulbifera 14 Canada Bluejoint Calamagrostis canadensis 6	57%			
		False Solomon's Seal	Maianthemum racemosum	2 1 1 1 4 3 3 3 1 1 1 1 1 1 1 1 1 2 8 1 1 7 2 5 6 14 6 5 5 5 5 1 1 1 1 5 14 1 1 3 1 1 2 39 39 3 1 12 1 1 25 1 1 8 2 7 11 8 8 2 7 11	7%
		Sensitive Fern	Onoclea sensibilis		50%
	5	Virginia Creeper	Parthenocissus quinquefolia		14%
			Lycopus virginicus		36%
		Jewelweed	Impatiens capensis		19%
	Bush Honeysuckle Black Raspberry Woodbine Common Buckthor Speckled Alder Virginia Creeper White Snakeroot Red Oak Black Raspberry Slender Willow Kentucky Bluegras Canada Mayflower False Solomon's Se Sensitive Fern Virginia Creeper Virginia Buglewee Jewelweed Bulblet-bearing W Canada Bluejoint Rice Cut Grass Creeping Charlie Dandelion Common Buckthor White Snakeroot Silver maple Green Ash Dandelion Black Locust False Solomon's Se Canada Mayflower Reed Canary Grass Kentucky Bluegras White Oak Common Buckthor Canada Bluejoint Early Meadow Rue Reed Canary Grass Jewelweed Northern Marsh Fe Nad Dog Skullcap Rice Cut Grass	Bulblet-bearing Water Hemlock	Cicuta bulbifera	14	45%
A B			Calamagrostis canadensis	6	19%
		-	-	5	16%
		Creeping Charlie	Glechoma hederacea	5	45%
	15	Dandelion	Taraxacum officinale	5	45%
		Common Buckthorn	Rhamnus cathartica	1	9%
		White Snakeroot	Ageratina altissima	2 1 1 1 4 3 3 3 1 1 1 1 1 1 1 1 2 8 1 1 7 2 5 6 14 6 5 5 5 1 1 1 5 14 1 1 3 1 2 39 3 1 12 1 1 25 1 8 2 7 11 8 2 7	5%
	10	Silver maple	Acer saccharinum		25%
		Green Ash	Fraxinus pennsylvanica	14	70%
		Dandelion	Taraxacum officinale	1	2%
		Black Locust	Robinia pseudoacacia	2 1 1 1 4 3 3 3 1 1 1 1 1 1 1 1 1 2 8 1 7 2 5 6 14 6 5 5 5 1 1 1 5 14 1 1 3 1 2 39 3 1 1 2 39 3 1 1 2 1 2 1 8 2 7 11	2%
		False Solomon's Seal	Maianthemum racemosum		5%
	Bush Honeysuckle Black Raspberry Rubus occidentalis 1 15 Common Buckthorn Speckled Alder Virginia Creeper Red Oak Black Raspberry Rubus occidentalis 1 10 10 10 10 10 10 10 10 10 10 10 10 1	2%			
	-	Reed Canary Grass	Phalaris arundinacea	2	3%
В	3	Kentucky Bluegrass	Poa pratensis	39	61%
		White Oak	Quercus alba	3	5%
		Common Buckthorn	Rhamnus cathartica	1	2%
		Canada Bluejoint	Calamagrostis canadensis	12	19%
		Early Meadow Rue	Thalictrum dioicum	1	2%
		Reed Canary Grass	Phalaris arundinacea	25	44%
		Jewelweed	Impatiens capensis	1	2%
		Northern Marsh Fern	Thelypteris palustris	8	14%
	0	Mad Dog Skullcap	Scutellaria lateriflora	2	4%
		Rice Cut Grass	Leersia oryzoides	7	12%
		Sensitive Fern		11	19%
		Virginia Bugleweed	Lycopus virginicus	3	5%

Transect	Quadrat (m from water)	Species (Common name)	Species (Latin name)	# Individuals	% Cover
		Common Buckthorn	Rhamnus cathartica	10	59%
		Virginia Creeper	Parthenocissus quinquefolia	<del> </del>	18%
	15		Thelypteris palustris	2	12%
			Lonicera Spp.	<del> </del>	6%
			Fraxinus pennsylvanica		6%
			Typha latifolia		11%
	4.0		Fraxinus pennsylvanica		14%
	10		Lycopus virginicus		4%
			Phalaris arundinacea		68%
Transect (m from water)    Common Buckthorn		Salix subsericea		4%	
C			Sagittaria latifolia	•	12%
	_		Lycopus virginicus	•	6%
	5	Bulblet-bearing Water Hemlock	Cicuta bulbifera	<b>+</b>	6%
			Thelypteris palustris	ł	12%
			Phalaris arundinacea		65%
			Scutellaria lateriflora	1	2%
			Pilea pumila	1	6%
	0		Sagittaria latifolia	1	6%
	ŭ	-	Carex lacustris		2%
			Leersia oryzoides	<b>-</b>	15%
			Phalaris arundinacea	3 2 1 1 1 3 4 1 1 19 1 1 2 1 1 1 2 11 1 3 3 3 1 7 33 2 7 1 2 7 1 2 1 2 9 9 9 1 11 5 36 28 4 2 1 1 1 1 5 36 28 4 2	69%
			Thelypteris palustris	t	7%
		Green Ash	Fraxinus pennsylvanica		10%
		Lake Sedge	Carex lacustris		7%
		Canada Bluejoint	Calamagrostis canadensis	7	24%
	15	Virginia Bugleweed	Lycopus virginicus	1	3%
		Pagoda Dogwood	Cornus alternifolia	2	7%
		Black Willow	Salix nigra	1	3%
		Sensitive Fern	Onoclea sensibilis	2	7%
		Reed Canary Grass	Phalaris arundinacea	9	31%
		Reed Canary Grass	Phalaris arundinacea	9	43%
	10	Meadow Willow	Salix subsericea	1	5%
D		Lake Sedge	Carex lacustris	11	52%
	5	Lake Sedge	Carex lacustris	5	12%
	,	Reed Canary Grass	Phalaris arundinacea	36	88%
		Reed Canary Grass	Phalaris arundinacea	28	60%
		Arrow-leaved Tearthumb	Persicaria sagittata	4	9%
		Broad-leaf Arrowhead	Sagittaria latifolia	2	4%
	0	Northern Marsh Fern	Thelypteris palustris	1	2%
		Purple loosestrife	Lythrum salicaria	1	2%
		Sensitive Fern	Onoclea sensibilis	2	4%
		Dwarf Clearweed	Pilea pumila	7	15%
		Italian Rye Grass	Lolium multiflorem	1	2%
		Bulblet-bearing Water Hemlock	Cicuta bulbifera	1	2%

	Quadrat				
Transect	(m from	Species (Common name)	Species (Latin name)	# Individuals	% Cover
	water)	. ,			
		White Willow	Salix alba	2	9%
		Pagoda Dogwood	Cornus alternifolia	1	4%
		Lake Sedge	Carex lacustris	8	35%
		Purple loosestrife	Lythrum salicaria	1	4%
	15	Canada Bluejoint	Calamagrostis canadensis	5	22%
		Wild Grape	Vitis riparia	2	9%
		Northern Marsh Fern	Thelypteris palustris	2	9%
		Northern Bugleweed	Lycopus uniflorus	1	4%
		Native Cattail	Typha latifolia	1	4%
		Lake Sedge	Carex lacustris	2	11%
		Red Osier Dogwood	Cornus sericea	2	11%
	10	Smartweed	Persicaria spp.	2	11%
E		Native Cattail	Typha latifolia	9	50%
		Canada Bluejoint	Calamagrostis canadensis	3	17%
		Native Cattail	Typha latifolia	10	26%
	5	Canada Bluejoint	Calamagrostis canadensis	25	64%
	,	Labrador Bedstraw	Galium labradoricum	3	8%
		Bulblet-bearing Water Hemlock	Cicuta bulbifera	1	3%
		Lake Sedge	Carex lacustris	4	9%
		Swamp Loosestrife	Decodon verticillatus	1	2%
	0	Canada Bluejoint	Calamagrostis canadensis	34	74%
		Rice Cut Grass	Leersia oryzoides	3	7%
		Purple loosestrife	Lythrum salicaria	1	2%
		Dwarf Clearweed	Pilea pumila	2	4%
		Curlydock	Rumex crispus	2 1 8 1 5 2 2 1 1 2 2 1 1 2 2 2 2 9 3 10 25 3 1 4 1 34 3 1	2%
		Purple loosestrife	Lythrum salicaria	5	12%
		Lake Sedge	Carex lacustris	5	12%
	15	Labrador Bedstraw	Galium labradoricum	2	5%
	15	Canada Bluejoint	Calamagrostis canadensis	14	33%
		Native Cattail	Typha latifolia	1	2%
		Wiregrass Sedge	Carex lasiocarpa	1 8 8 1 1 5 5 2 2 2 1 1 1 1 2 2 1 1 1 1 1 1 1	37%
		Woolgrass	Scirpus cyperinus	1	2%
		Lake Sedge	Carex lacustris	10	16%
	10	Dwarf Clearweed	Pilea pumila	14	22%
	10	Canada Bluejoint	Calamagrostis canadensis	36	57%
		Tufted Loosestrife	Lysimachia thyrsiflora	1	2%
F		Boxelder	Acer negundo	1	2%
ı		Purple loosestrife	Lythrum salicaria	_	3%
		Broad-leaf Arrowhead	Sagittaria latifolia		3%
		Marsh Bellflower	Campanula aparinoides	+	3%
	5	Broad-leaf Arrowhead	Sagittaria latifolia		5%
		Lake Sedge	Carex lacustris		5%
		Small-spike False Nettle	Boehmeria cyclindrica		3%
		Canada Bluejoint	Calamagrostis canadensis		80%
		Rice Cut Grass	Leersia oryzoides		9%
		Dwarf Clearweed	Pilea pumila		43%
	0	Canada Bluejoint	Calamagrostis canadensis		37%
		Northern Marsh Fern	Thelypteris palustris		6%
		Purple loosestrife	Lythrum salicaria	4	6%

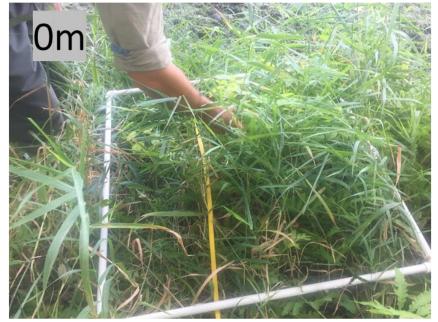
### Appendix C: Field Photos of each Quadrat surveyed, Sept 13-14, 2018

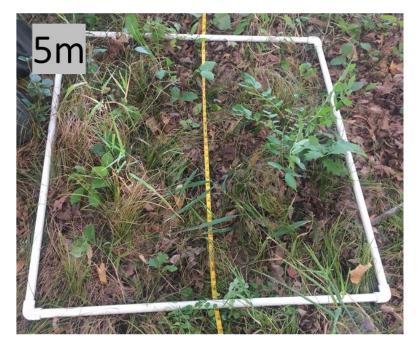
Transect labeled in blue, Distance from shore indicated in meters









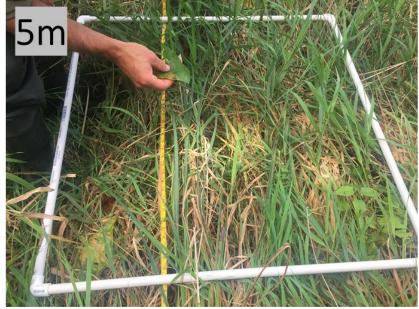


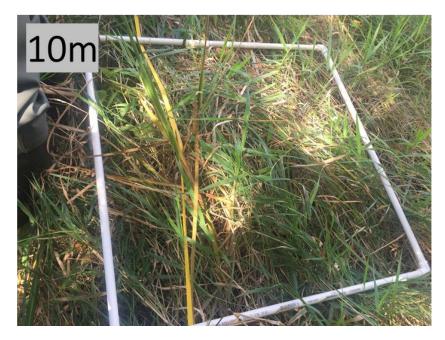




























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