

Washburn County

Shoreland Buffer Mitigation Standards



An instruction packet for landowners who are required to restore or create a shoreline vegetation protection area (buffer)

Adopted by the Washburn County Zoning Committee
March 21, 2000, amended, January 23, 2007

Washburn County Buffer Mitigation Standards

1. Introduction

You have initiated an action with the Washburn County Zoning Office that requires mitigation of the buffer. Webster's Dictionary defines mitigation as, "to make mild, or less severe". A buffer, in this situation, is the area of natural vegetation that is (or should be) between your home and the lake. This buffer protects the water from human impact and provides many other environmental benefits. In your case, you must lessen (mitigate) the negative effects to the lake caused by development by preserving, enhancing or creating a buffer, sometimes called the shoreline vegetation protection zone.

This packet of information has been written to help you understand that requirement, so some of the legal jargon and statute references have been intentionally omitted. If you question this requirement however, the actual law and ordinances are available at the Zoning Office or on-line. This packet also only deals with the aspect of mitigation that pertains to buffers. Mitigation in general, may also entail other practices and requirements.

2. Uses in the buffer

A buffer may exist on your property or you may need to enhance or create one. Generally, the buffer is a "no-disturb" zone where most activities are prohibited. **Within the buffer you may not do the following:**

- A. Mow grass or clear other vegetation (unless classified as noxious).
- B. Remove trees (except those that are dead, diseased or that pose a safety hazard).
- C. Mechanically grade or redistribute soil.
- D. Fill areas classified as wetland.

The goal of buffer preservation or creation is to protect the lake environment and to filter the view of your property from the water. Nonetheless, it is important for you to utilize your property and the water; therefore, **the following activities and provisions are allowable in the buffer:**

- E. A viewing and access corridor through the buffer to "access" the lake or river and to achieve a "filtered view" of the water. This corridor must not be mowed or clear-cut and any vegetation removal should be selective and limited. One 30' wide corridor is allowed per waterfront lot (width shall be reduced proportionally for lots less than 100'). The corridor shall be at least 10' from neighboring property lines and shall be perpendicular to the shoreline. A corridor may not be established where the absence of vegetation provides a natural opening.
- F. One access pathway. The pathway shall be located in the access corridor* and shall be no more than 4' wide. It may be left natural, mowed, or constructed with mulch or natural colored stone (so long as the surface remains pervious). The pathway may also be of wood construction and may include stairs to reach the water. Stairs may include 40 sq. ft. landings at switchbacks for safety reasons. If wooden walkways and/or stairs exceed 65 sq. ft., a land-use permit is required from the Zoning Office. A powered pedestrian lift

may be placed in the corridor adjacent to the pathway. The location must also be approved by the Zoning Office.

*If soil conditions or slope constraints do not allow safe construction of the path in the corridor, alternate locations must be approved by the Zoning Office.

- G. Construction of a pier, wharf, temporary boat shelter or boat lift. Placement shall be confined to waters adjacent to the corridor, unless location is not feasible due to steep slopes or wet soils.
- H. Shoreline protection activities authorized by State permit and/or erosion control measures approved by the Washburn County Land and water Conservation department.
- I. Roadways adjacent to State permitted stream crossings.
- J. Public and private watercraft launching sites provided:
 - 1) A conditional use permit is obtained from the Zoning Office.
 - 2) Construction is on slopes 20% or less over a 50' distance.
 - 3) A residential site will not be approved if a public site is available.
 - 4) No paving shall be done on residential sites.
 - 5) The site is located in the viewing corridor.
 - 6) A State Chapter 30 permit is obtained for all construction below the OHWM.
 - 7) Vegetation removal is minimized and erosion in the corridor is controlled.
- K. Fish and wildlife habitat management projects that are included in a State approved management plan.
- L. Commercial timber harvesting provided:
 - 1) The lands are public (County, State or Federal).
 - 2) The land is zoned Forestry or Agriculture.
 - 3) The activity complies the methods specified in Wisconsin's Forestry Best Management Practices for Water Quality.
- M. Agriculture cultivation provided:
 - 1) The land is zoned agriculture.
 - 2) The activity complies with the appropriate practices specified in the Shoreland Best Management Practices for Agriculture.

3. Buffer mitigation required by law

Wisconsin State Statutes 59.69, Wisconsin Administrative Code NR115 and the Washburn County Shoreland Ordinance (Chapter 38, Article IV, Division 27), define the buffer as "a zone of natural vegetation that extends from the ordinary high water mark (OHWM) inland". This buffer can be adjacent to a lake, river, creek or stream. The buffer extends the length of the shoreline and to a distance of 25' less than the building setback for that water body; normally from a minimum of 35' to a maximum of 100'. The width or size of your buffer that you must preserve, enhance or create depends upon the type of action you are involved with. By law, the specific actions listed below require mitigation. The noted size of the buffer is the requirement for that activity:

- A. Renovation to, or enlargement of a nonconforming (closer to water than current setback) principal structure-35' buffer required
- B. Expansion (more than 50%) or replacement of a conforming principal structure with a new one of equal size of larger- 35' buffer required

- C. A permit is issued for a structure (deck or gazebo) in the setback area- 50' to 100' buffer required
- D. Mitigation is added as a condition to a variance granted by the Board of Adjustments-35' buffer required
- E. A nonconforming structure damaged by violent wind, fire or flood is replaced by structure of equal size- 35'buffer required
- F. A buffer violation occurs- enforcement action plus 50' to 100' buffer replacement required

4. Methods and procedure

Now that you know that buffer mitigation is a requirement associated with the activity you wish to do (or have done, if a violation), there are some steps to follow before you begin construction:

- A. File an affidavit- By law, you must file an affidavit with the Zoning Office and record it with the Register of Deeds. This affidavit ensures that you will perform the mitigation and is attached to the deed to your property. **It must be filed prior to the issuance of a land-use permit.** A blank affidavit form is included with this packet, (attachment 1).
- B. Obtain a land-use permit- As with any construction project in Washburn County, all structures require a land-use permit (unless the structure is separate and less than 65 sq. ft., all setbacks still apply). By law, you must have a sanitary permit before building a dwelling, including some additions. Check with the Zoning Office if you are not sure if a sanitary permit is required.
- C. Begin desired construction- Once you have obtained all necessary permits (including applicable State and Town permits), you may begin construction. As stated in the affidavit, you must also perform the mitigation. Since mitigation deals with the installation of plant materials and because the growing season is limited in this region, **you will have (2) two years from permit issuance for the buffer to be established.**
- D. Prepare a mitigation plan- *As soon as possible after obtaining your land-use permit, you should prepare your mitigation plan. This packet will assist you in doing so, or you may utilize a consultant. You should submit the plan to the Washburn County Land and Water Conservation Department (LWCD), who will work with you toward approval of your plan.

*Note:

By law, if you are seeking a permit to place a structure in the shoreland setback area (see item 3.C. above), your mitigation plan must be submitted when you file the affidavit at/or prior to permit issuance.

5. The mitigation plan

You may create your individual mitigation plan or you may wish to hire a landscape consultant. A list of some consultants is provided with this packet, (attachment 2). Generally, the plan should show your buffer size, location of viewing corridor and pathway, location of structures, names, number and location of plant materials and so on.

A blank mitigation plot plan and example are included with this packet (attachment 3). It will instruct you on what information to include.

There are basically four methods of mitigation recovery that will establish or maintain a buffer. Each method involves preserving or establishing three vegetative layers which are ground cover (grasses, etc.), shrub under-story and tree canopy. Attempts should be made to duplicate or mimic the undisturbed vegetative habitat that exists around your particular water body.

- A. Avoidance- Your buffer may be totally intact or undisturbed. If that is the case, your affidavit will simply state that you will not disturb the area and will remain compliant with placement of your viewing corridor, etc.
- B. Natural Recovery- Your buffer may be basically present but some of the under-story vegetation may have been removed, or the area may be regularly mowed to the shore. The goal here is to reestablish the natural condition, had the area not been disturbed. The recovery method in this case involves simply stopping all mowing or clearing and letting the area regenerate naturally.
- C. Accelerated Recovery (enhancement) - This method is similar to natural recovery above, but entails actually installing some plant materials to achieve proper vegetation density, outlined in the table included in this packet, (Attachment 4). Simply stated, you will be filling in areas that are too thin or where the vegetation is missing.
- D. Accelerated Recovery (creation) - This method is used when no buffer exists. The area in question may have been graded to bare soil or the site may have been mowed for many years. Creation will involve planting groundcover, shrubs and trees.

6. Prepare your plan

This information is written for property owners who wish to prepare the mitigation plan themselves. At first, the concept may seem difficult, but as you become more comfortable with the requirements and the plan format, you will discover that it is simply planning to preserve what is the existing buffer, ceasing to disturb the existing buffer, or filling in places where vegetation is missing. In the extreme case, you may have to plan for and install a complete buffer. As stated previously, you still may wish to utilize a consultant or other knowledgeable person for plan preparation. Use of a consultant is recommended if you are required to complete a plan/installation involving accelerated recovery. You may also refer to the publication Shoreline Buffer Restoration, a Guide for Landowners, available at the Zoning Office. This publication discusses mitigation in detail and contains information of plan preparation. The steps below should be followed as you prepare your plan:

- A. When you contact the Zoning Office about your project and/or permit requirements, you will be informed as to the requirements of buffer mitigation. This will include what size (depth and width) of buffer you should preserve or create (see section 3 above).
- B. Refer to the blank plan template in this packet (attachment 3). Simply fill in the information and draw the particular features that are associated with your property.
- C. Now, consider and visualize your existing buffer. Is it the correct size and undisturbed? Is it the correct size but sparsely vegetated (too thin)? It may be heavily vegetated but not of

Shoreland Mitigation/Preservation Affidavit
Must be submitted prior to the issuance of a land use permit

Pursuant to Section 38 Division 27 of the Washburn County
Land Development Code and Section §59.692 (IV) WI Statutes.

(must be in black ink)

I, , understand and

accept the requirement to perform shoreline mitigation on my property

located at

(legal description)

S T North, R West, Washburn County, Wisconsin.

Record Id# _____

I agree that the Shoreline Vegetation Protection Area width of feet

on , which is a Class water body,

shall be preserved, maintained or restored in accordance with the Washburn

County Shoreline Vegetation Protection Area, Section 38-596 of the Land

Development Code.

I also understand that my property will be inspected to ensure that the current conditions of the Shoreline Vegetation Protection Area are maintained. This agreement will be in place before a land use/zoning permit will be issued for actions that require mitigation.

Mitigation may include all of the following:

1. The privately owned wastewater treatment system must be evaluated and upgraded as appropriate
2. Native vegetation and water quality protection functions of the shore buffer area must be restored
3. Nonconforming accessory structures must be removed
4. Standard erosion and stormwater runoff control measures must be implemented
5. Additional conditions:

Owner Seal

Owner Seal

Authentication of Acknowledgment
STATE OF WISCONSIN- County of Washburn

This instrument drafted by:
(print or type name below)

Subscribed and sworn to before me on _____ by the above named person(s).

Signature of notary or other person
authorized to administer an oath _____

(as per s. 706.06, 706.07, Stats.

Print or type name: _____

Title: _____ Date commission expires: _____

State Bar No. _____ [if applicable]

Return to Zoning

Re: Permit(s) #

PARCEL IDENTIFICATION NUMBER (PIN)

Plant and Seed Sources and Consultants (Attachment 2)

Nursery	Seeds	Plants	Aquatics/ Wetland	Prairie – Grasses/Forbs	Woodland Groundcovers	Woodland Trees/Shrubs	Other Comments
<i>Washburn County Land and Water Conservation Dept.</i> Shell Lake, Wisconsin —715-468-4654		☼		☼		☼	Order: beginning in January Pick-up: Trees – Late April Grasses and forbs – Early June
<i>Dragonfly Gardens</i> Amery, Wisconsin —715-268-7660 www.dragonflygardens.net		☼	☼	☼	☼	☼	Wide selection of prairie and wetland plants. Native trees, shrubs, and woodland plants available
<i>Hild & Associates</i> River Falls, Wisconsin —1-800-790-9495		☼	☼	☼			Sedge meadow and littoral zone plants
<i>Ion Exchange</i> Harpers Ferry, Iowa —1-800-291-2143	☼	☼		☼			More than 250 species of seeds and greater than 100 plant plugs
<i>J&J Aquatic Nursery</i> Wild Rose, Wisconsin —1-800-622-5055			☼		☼		Source for most wetland grasses, sedges, rushes and shrubs, also carries Pennsylvania sedge
<i>Jung's Seed Company</i> Randolph, Wisconsin —1-800-247-5864	☼	☼			☼		Economical source for woodland ferns
<i>Landscape Alternatives</i> Roseville, Minnesota —651-488-3142		☼		☼		☼	Seed source collected within 100 miles of St. Paul/Minneapolis
<i>Oak Prairie Farm</i> Pardeeville, Wisconsin —1-800-894-3884	☼			☼			Collected seeds, great variety
<i>Prairie Nursery</i> Westfield, Wisconsin —608-296-3679	☼	☼		☼	☼		Catalog has great photos of native grasses and forbs, carries a few woodland edge species
<i>Prairie Moon Nursery</i> Winona, Minnesota —507-452-1362	☼	☼		☼	☼	☼	Specializes in prairie plants, but has several woodland edge species
<i>Prairie Restoration</i> Princeton, Minnesota —612-389-4342	☼	☼		☼			Several specialized seed mixes
<i>Wildlife Nurseries</i> Oshkosh, Wisconsin —920-231-3780	☼	☼	☼				Specializes in wetland species for waterfowl and other wildlife species
<i>Winter Greenhouse</i> Winter, Wisconsin —715-266-4963		☼		☼	☼	☼	Selection of native woodland plants suited for the northwoods—does not ship

Consultants

Dragonfly Gardens: 715-268-7660
Amery, WI

Sue Aschbacher- Lit'l Shepherds Farm: 715-635-2426 (home)
Spooner, WI 715-520-0093 (cell)

Cheryl Clemens- Environmental Harmony: 715-268-9992
Amery, WI

Paul Hlina- The Leaning Pine Native Landscape Company 715-398-5453

Buffer Mitigation Plot Plan (attachment 3)

Approval _____ Date _____

Name _____ Mailing address _____

Property address _____

Map number _____ Legal Description _____

Buffer size (depth) required (check one) _____ 35' _____ 50' _____ 75' _____ 100' **X** width of lot = _____ sq. ft.

Recovery method (check one) _____ avoidance (no dist.) _____ natural recov. _____ accelerated (enhance) _____ accelerated (create)

Number of trees (must be more than 2 years old and greater than 1' tall) to be installed _____

Species _____

Number of shrubs to be installed _____

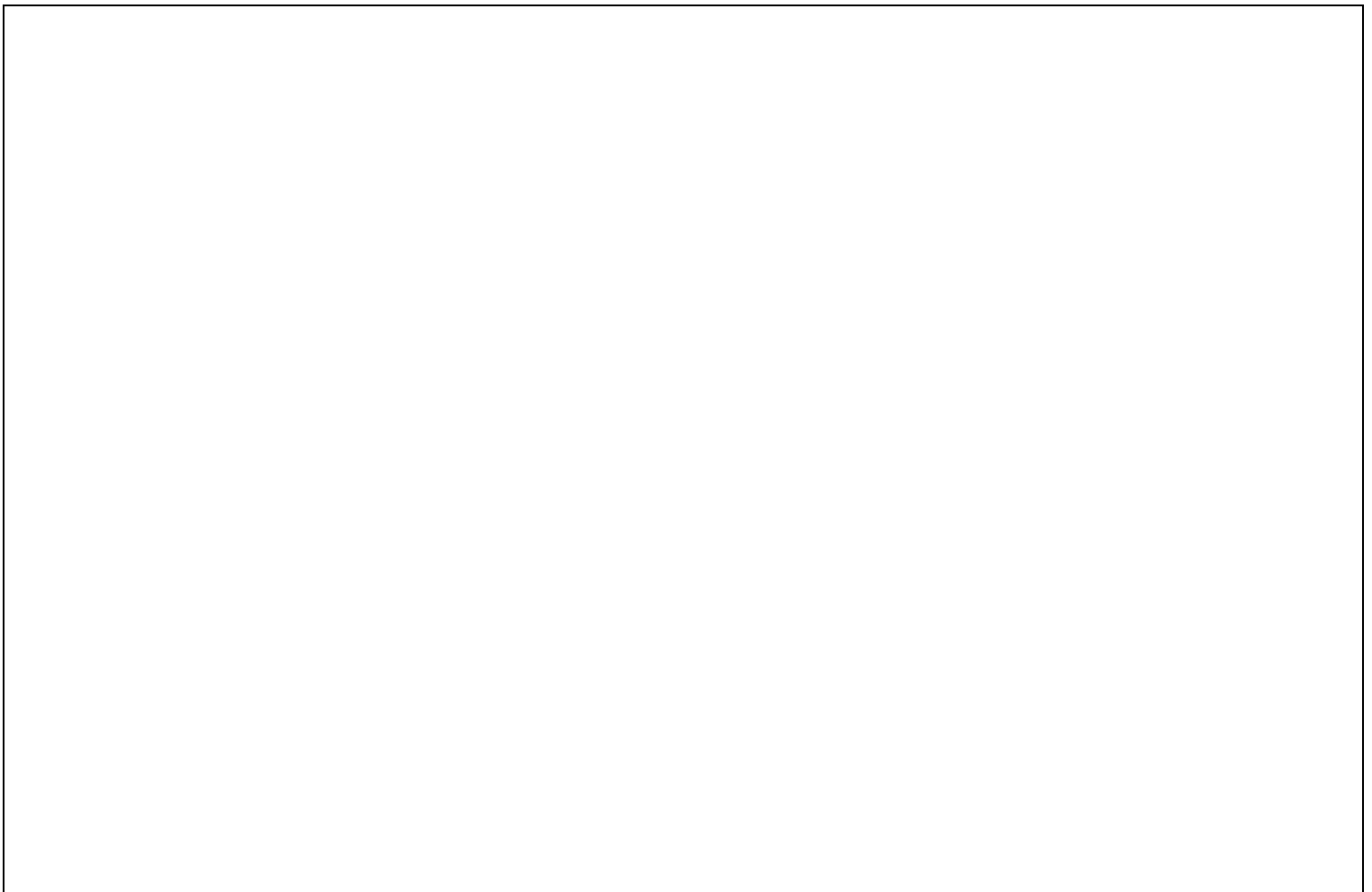
Species _____

Groundcover type (check one) _____ plant plugs _____ seed mix

Mix type or species _____

Please show the following on your plan:

- North arrow
- Location of ordinary high water mark (OHWM)
- Location and size of all structures on property
- Location and dimensions of viewing and access corridor
- Location of property lines
- Location and dimensions of 4' access pathway, walkway or stairs
- Boundary of buffer zone
- Location of existing vegetation
- Location of proposed plantings



Scale _____

Comment section next page

Buffer Mitigation Plot Plan (attachment 3)

Approval _____ Date _____
 123 North Street, Nashville, TN 37201

Name Kenny Chesney Mailing address

Property address N3854 deep Lake Rd., Sarona, WI 54870

Map number MA 889 Legal Description Lot 25, Deep Lake Hills, S 19, T38, R11

Buffer size (depth) required (check one) 35' _____ 50' _____ 75' _____ 100' X width of lot = 3,500 sq. ft.

Recovery method (check one) _____ avoidance (no dist.) _____ natural recov. accelerated (enhance) _____ accelerated (create)

Number of trees (must be more than 2 years old and greater than 1' tall) to be installed 20

Species: white pine, basswood, n. pin oak

Number of shrubs to be installed 40+

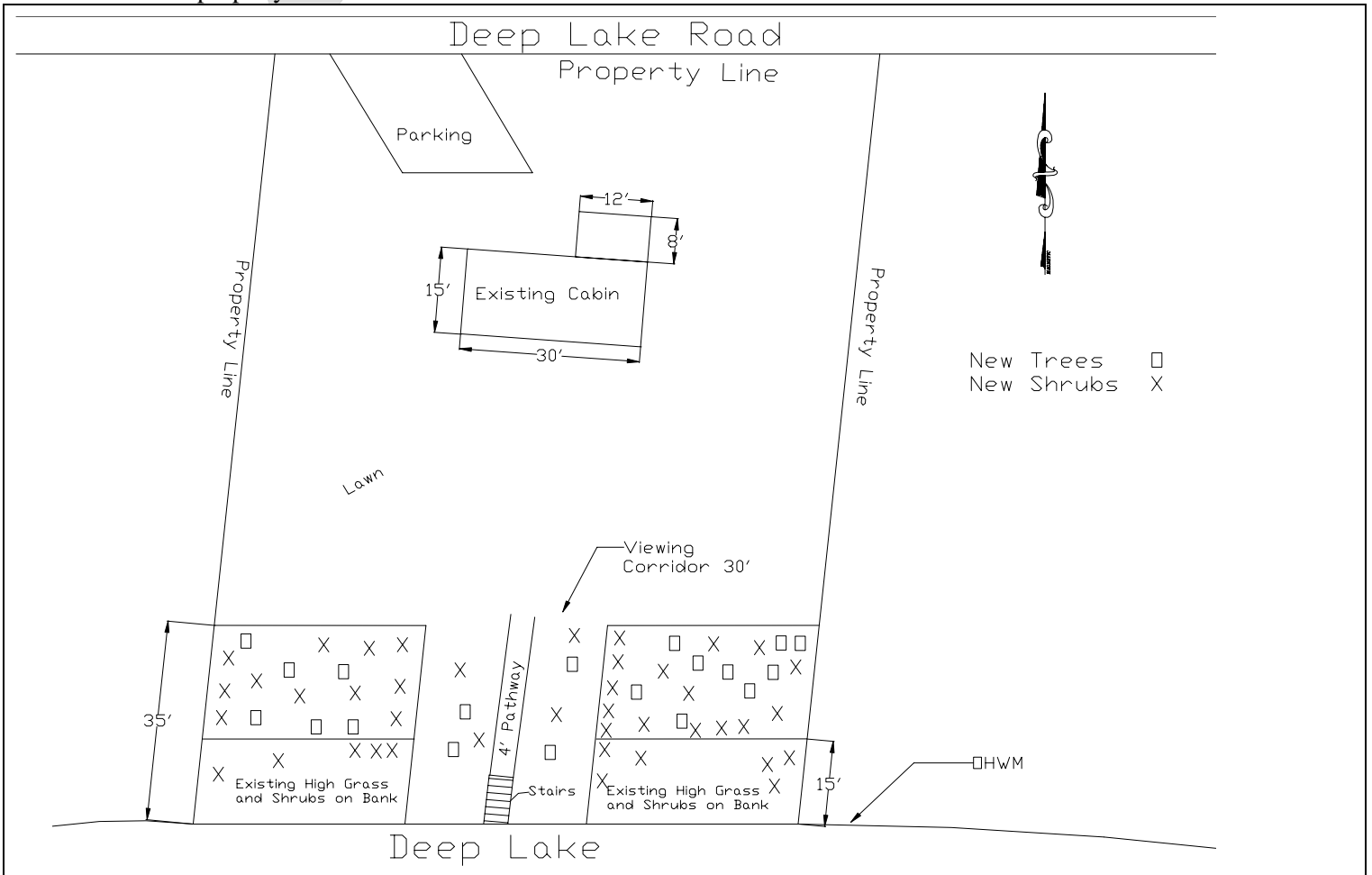
Species: black huckleberry, New Jersey tea, short prairie rose, dwarf honeysuckle

Groundcover type (check one) _____ plant plugs _____ seed mix (see comments)

Mix type or species n/a

Please show the following on your plan:

- North arrow
- Location of ordinary high water mark (OHWM)
- Location and size of all structures on property
- Location and dimensions of viewing and access corridor
- Location of property lines
- Location and dimensions of 4' access pathway, walkway or stairs
- Boundary of buffer zone
- Location of existing vegetation
- Location of proposed plantings



Scale 1:20

Comment section next page

Attachment 3

Comments

The existing buffer is thick with grasses and shrubs back from the water to a depth of 15 feet. The bank is steep. The rest of the buffer area is lawn that has been mowed.

The plan will include:

Ground cover- Ground is 100% vegetated. We will stop mowing back to 35".

Shrubs- Required buffer is 3500 square feet, less 1500 square feet on bank. We will plant 40 shrubs (2 per 100 square feet).

Trees- We will plant 20 trees (1 per 100 square feet).

Table of density requirements for mitigation projects (attachment 4)

Layer	Minimum number of different species	Number to be installed per 100 sq. ft.	Credits for existing vegetation*	Planting dates
Tree canopy	3	1	1 existing tree = 0.3 new trees	April 15 to Nov. 15
Shrub understory	4	1.5 - 2	1 existing shrub = 0.5 new shrubs	April 15 to Nov. 15
Groundcover plant plugs	1	70	n/a	May 15 to Nov. 15
Groundcover seedlings, cool season	1	general seed broadcasting	complete cover of bare soil	May 1 to June 15
Groundcover seedlings, warm season	1	general seed broadcasting	complete cover of bare soil	Thaw to July 15

*Credit is received for all existing vegetation. For example, if all soil is covered by grasses, you do not have to install plantings in that layer. Likewise, if your buffer has 10 existing trees, they would count as 3 new trees.

Key to plant list symbols

Soil Moisture

Symbol	Term	Description
W	Wet	Soggy or marshy most of the year.
	Wet Mesic	Excessively wet in winter, spring, and after heavy rain, but often dries in summer.
WM		
	Mesic	Sites or habitats characterized by intermediate moisture conditions, i.e., neither decidedly wet nor decidedly dry.
M		
	Dry Mesic	Well Drained Sandy Soils. Water is removed from soil readily, but not rapidly.
DM		
	Dry	Excessively drained, Sandy Soils on a relatively steep slope and exposed to drying winds.
D		

Light Conditions

Symbol	Term	Description
FU	Full Sun	Receives 85% or more of the available sunlight
PU	Part Sun	Receives 50 - 80% of the available sunlight
PS	Part Shade	Receives 20% to 50% of the available sunlight
SH	Shade	Receives less than 20% of the available sunlight

Color

DkB - Dark Blue	Org - Orange
DkR - Dark Red	Pur - Purple
Lav - Lavender	Red - Red
LtB - Light Blue	Ros - Rose
Mag - Magenta	Tan - Tan
Crn - Cream	Grn - Green
Pnk - Pink	P/R - Pink or Red
R&Y - Red & Yellow	

Web Sites

Web Sites Non Commercial

<http://wisplants.uwsp.edu/vascularplants.html> --- U of W Stevens Point web site.
<http://www.botany.wisc.edu/wisflora/GenusList.asp>
<http://woodyplants.nres.uiuc.edu/> --- U of Ill at Urbana, Start search by genus
<http://www.hort.uconn.edu/plants/index.html> --- U of Conn. Start search by latin or common name
<http://www.klines.org/joanne/Archive/archive.html> --- Wisconsin DNR supported web site.

Web Sites Commercial

<http://www.dragonflygardens.net/> --- (Dragonfly Gardens) They sell seed, plugs and equipment, pickup up at nursery. Located in Amery Wisconsin.
<http://www.prairiemoon.com/>--- (Prairie Moon Nursery) Located near Winona MN. Very Large selection, and lots of good reliable information. Will have photos of the more popular plants. Mail order bareroot plants and seed. Bareroot plants in Spring and Fall and seed year around.

Trees and Shrubs

Common Name	Species Name	Color	Height	Light	Soil
American Bittersweet	Celastrus scandens	Wht	to 30'	FU-PS	WM-D
American Mountain Ash	Sorbus americana	Wht	15-30'	FU-PU	WM-DM
Basswood	Tilia americana	Grn	to 100'	FU-PS	WM-DM
Black Chokeberry	Aronia melanocarpa	Wht	3-6'	FU-PU	W-DM
Black Huckleberry	Gaylussacia baccata	Wht	1-3'	FU-PU	WM-D
Bur Oak	Quercus macrocarpa	Grn	70-80'	FU-PU	M-D
Canada (Russet) Buffaloberry	Shepherdia canadensis	Wht	3-6'	FU-PU	M-D
Choke Cherry	Prunus virginiana	Wht	10-25'	FU-PU	M-D
Cockspur Hawthorn	Crataegus crus-gali	Wht	8-20'	FU-PS	WM-DM
Downy Arrow-wood	Viburnum rafinesquianum	Wht	6-8'	FU-PS	WM-DM
Downy Serviceberry	Amelanchier arborea	Wht	10-30'	FU-PS	M-D
Dwarf Bush Honeysuckle	Diervilla lonicera	Yel	1-4'	PU-SH	DM-D
Dwarf Sandcherry	Prunus pumila	Wht	1-3'	FU-PU	WM-D
Eastern White Pine	Pinus strobus	NA	100-150'	FU-PS	M-D
Gray Dogwood	Cornus racemosa	wht	6-8'	FU-PS	WM-D
Green Ash	Fraxinus pennsylvanica	Grn	50-60'	FU-PU	WM-DM
Hazelnut	Corylus americanus	Grn	6-8'	FU-PU	WM-DM
Hop Hornbeam	Ostrya virginiana	Yel	40'	PU-FS	WM-DM
Jack Pine	Pinus banksiana	NA	to 60'	FU-PU	M-D
Lowbush Blueberry	Vaccinium angustifolium	Wht	6-18"	FU-PS	WM-DM
Maple-leaf Viburnum	Viburnum acerifolium	Wht	3-5'	PU-SH	WM-D
Meadow Rose	Rosa blanda	Pnk	2-4'	FU-PU	M-D
Mountain Maple	Acer spicatum	Wht	25-30'	PU-FS	M-D
New Jersey Tea	Ceanothus americanus	Wht	2 -3'	FU-PU	WM-D
Ninebark	Physocarpus opulifolius	Wht	5-9'	FU-PU	WM-DM
Northern Pin Oak	Quercus ellipsoidalis	Grn	to 75'	FU-PU	M-D
Northern Red oak	Quercus borealis (rubra)	Grn	to 80'	FU-PS	M-DM
Paper Birch	Betula papyrifera	Grn	to 80'	FU-PU	WM-M
Pasture Rose	Rosa carolina	Pnk	1-4'	FU-PU	WM-D
Pin Cherry	Prunus pennsylvanica	Wht	15-25'	PU-PS	WM-D
Prairie Red-Root	Ceanothus herbaceus (ovatus)	Wht	2 -3'	FU-PS	DM-D
Prairie Willow	Salix humilis	Wht	3-8'	FU-PU	M-D
Red Berried Elderberry	Sambucus pubens	Wht	4-8'	FU-PS	M-D
Red Cedar	Juniperus virginiana	NA	20-50'	FU-PU	M-D
Red or Norway Pine	Pinus resinosa	NA	to 100'	FU-PU	M-D
Roundleaf Juneberry	Amelanchier sanguinea	Wht	15-20'	FU-PS	DM-D
Short Prairie Rose	Rosa arkansana	Pnk	1-4'	FU-PU	WM-D
Showy Mountain Ash	Sorbus decora	Wht	15-40'	FU-PS	WM-DM
Shrub Cinquefoil	Potentilla fruticosa	Yel	2-4'	FU-PU	W-D
Silver Buffaloberry	Shepherdia argentea	Yel	to 15'	FU-PU	M-D
Smooth Juneberry	Amelanchier laevis	Wht	15-25'	FU-PS	W-D
Staghorn Sumac	Rhus typhina (hirta)	Yel	8-30'	FU-PU	WM-D
Sugar Maple	Acer saccharum	Yel/Red	50-75'	PU-FS	M-DM
Velvet Leaf Blueberry	Vaccinium myrtilloides	Pnk	6-18"	FU-PS	W-M
White Oak	Quercus alba	Grn	to 75'	FU-PU	M-DM
White Spruce	Picea glauca	NA	50-75'	FU-PU	WM-DM
Wild Black Cherry	Prunus serotina	Wht	30-70'	FU-PU	M-D

Trees and Shrubs

Common Name	Species Name	Color	Height	Light	Soil
Wild Elderberry	<i>Sambucus canadensis</i>	Wht	5-8'	FU-PS	WM-DM
Wild Plum	<i>Prunus americana</i>	Wht	10-20'	FU-PU	WM-DM
Witch Hazel	<i>Hammemalis virginiana</i>	Yel	10-15'	PU-SH	WM-DM
Yellowbud Hickory	<i>Carya cordiformis</i>	Wht	50-70'	PU-FS	WM-DM
Balsam Fir	<i>Abies balsamifera</i>	NA	to 75'	FU-PS	WM-M
Black Ash	<i>Fraxinus nigra</i>	Yel	50'	PU-FS	W-M
Buttonbush	<i>Cephalanthus occidentalis</i>	Wht	3-6'	PU-PS	W-WM
Eastern White Cedar	<i>Thuja occidentalis</i>	NA	to 50'	FU-PS	W-M
Highbush Cranberry	<i>Viburnum trilobium</i>	Wht	10-12'	FU-PS	W-M
Meadowsweet	<i>Spiraea alba</i>	Wht	3-4'	FU-PU	W-WM
Nannyberry	<i>Viburnum lentago</i>	Wht	10-15'	FU-PS	W-M
Northern Bayberry	<i>Myrica gale</i>	Grn	3-4'	FU-PU	WM-M
Old Man's Beard	<i>Clematis virginiana</i>	Wht	to 12'	FU-PU	WM-M
Pagoda Dogwood	<i>Cornus alternifolia</i>	Wht	15-25'	PU-PS	W-M
Red Maple	<i>Acer rubrum</i>	Red	to 50'	PU-FS	W-M
Red Osier Dogwood	<i>Cornus sericea (stolonifera)</i>	Wht	3-10'	FU-PU	W-M
River Birch	<i>Betula nigra</i>	Grn	50-70'	FU-PS	W-WM
Running Serviceberry	<i>Amelanchier stolonifera (spicata)</i>	Wht	2-5'	FU-PU	M
Silky Dogwood	<i>Cornus ammomum</i>	Wht	3-10'	FU-PU	W-M
Silver Maple	<i>Acer saccharinum</i>	Yel/Red	60-100'	FU-PS	W-M
Snowberry	<i>Symphoricarpos albus</i>	Wht	3-4'	PU-SH	W-WM
Steeplebush	<i>Spiraea tomentosa</i>	Pnk	2-4'	FU-PU	W-WM
Swamp (Tag) Alder	<i>Alnus rugosa (incana)</i>	Grn	10-15'	FU-PS	W-M
Tamarack	<i>Larix laricina</i>	NA	40-60'	FU-PS	W-WM
Winterberry Holly	<i>Ilex verticillata</i>	Wht	to 6'	FU-PS	WM-M
Yellow Birch	<i>Betula allegheniensis</i>	Grn	60-90'	FU-PS	W-WM

Wild Flowers

Common Name	Species Name	Color	Height	Light	Soil
Alum Root	<i>Heuchera richardsonii</i>	Wht	12-18"	FU - PU	WM-D
Anise Hyssop	<i>Agastache foeniculum</i>	Pur	24 - 48"	FU - PU	M-DM
Arrow-leaved Aster	<i>Aster urophyllus</i>	LtB	24 - 48"	PS - PS	M-DM
Bergamot	<i>Monarda fistulosa</i>	Lav	24 - 48"	FU - PS	WM-D
Big Leaf Aster	<i>Aster macrophyllus</i>	Wht	6 - 12"	PS - PS	WM-D
Black Eyed Susan	<i>Rudbeckia hirta</i>	Yel	12 - 36"	FU - PU	WM-D
Bush Clover	<i>Lespedeza capitata</i>	Grn	24-36"	FU - PU	M-D
Butterfly Weed	<i>Asclepias tuberosa</i>	Org	12 - 24"	FU - PU	M-D
Calico Aster	<i>Aster lateriflorus</i>	Wht	12 - 36"	PS - PS	WM-DM
Canada Milk-vetch	<i>Astragalus canadensis</i>	Crn	12 - 48"	FU - PU	WM-DM
Cream Gentian	<i>Gentiana alba</i>	Crn	18 - 30"	FU - PU	WM-DM
Cream Wild Indigo	<i>Baptisia bracteata</i>	Crn	18 - 30"	FU - PU	M-D
Culver's Root	<i>Veronicastrum virginianum</i>	Wht	36-54"	FU - PU	WM-DM
Dotted Mint	<i>Monarda punctata</i>	Lav	6 - 30"	FU - PU	DM-D
Drummond's Aster	<i>Aster drummondii</i>	B/W	12 - 48"	FU - PU	WM-DM
Dwarf Blazing Star	<i>Liatris cylindracea</i>	Pur	8 - 24"	FU - PU	DM-D
Early Meadowrue	<i>Thalictrum dioicum</i>	Grn	8 - 28"	PS - PS	WM-DM
False Sunflower	<i>Heliopsis helianthoides</i>	Yel	24 - 60"	FU - PU	WM-DM
Fireweed	<i>Epilobium angustifolium</i>	Pnk	24 - 72"	FU - PU	WM-DM
Flowering Spurge	<i>Euphorbia corollata</i>	Wht	24 - 48"	FU - PU	M-D
Frost Aster	<i>Aster pilosus</i>	Wht	24 - 60"	FU - PU	WM-D
Giant Hyssop	<i>Agastache scrophulariaefolia</i>	Pur	48 - 60"	FU - PU	WM-DM
Golden Alexanders	<i>Zizia aurea</i>	Yel	12 - 36"	FU - PU	WM-DM
Grass Leaf Goldenrod	<i>Euthamia graminifolia</i>	Yel	12 - 48"	FU - PU	W-D
Harebell	<i>Campanula rotundifolia</i>	Pur	4 - 20"	FU - PU	DM-D
Heart-leaf Golden Alex	<i>Zizia aptera</i>	Yel	12 - 36"	FU - PU	M-DM
Heath Aster	<i>Aster ericoides</i>	Wht	12 - 36"	FU - PU	M-D
Hoary Vervain	<i>Verbena stricta</i>	DkB	24 - 36"	FU - PU	DM-D
Jacob's Ladder	<i>Polemonium reptans</i>	Blue	8-24"	PS - PS	WM-DM
Large Flowered Bellwort	<i>Uvularia grandiflora</i>	Yel	12"	PS - FS	WM-DM
Leadplant	<i>Amorpha canescens</i>	Pur	30 - 42"	FU - PU	M-D
Mountain Mint	<i>Pycnanthemum virginianum</i>	Wht	24-36"	FU - PS	M-DM
New England Aster	<i>Aster novae-angliae</i>	Pur	24-48"	FU - PU	W-DM
New Jersey Tea	<i>Ceanothus americanus</i>	Wht	24 - 36"	FU - PS	WM-D
Northern Bedstraw	<i>Galium boreale</i>	Wht	20 - 30"	FU - PS	W-DM
Ohio Spiderwort	<i>Tradescantia ohiensis</i>	Blue	24 - 48"	FU - PU	WM-D
Pale Indian Plantain	<i>Cacalia atriplicifolia</i>	Wht	36 - 72"	FU - PS	M-DM
Pasque Flower	<i>Anemone patens</i>	Lav	2 - 14"	FU - PU	DM-D
Pearly Everlasting	<i>Anaphilis margaritacea</i>	Wht	12 - 36"	FU - PS	M-D
Plantain Pussy Toes	<i>Antennaria plantaginifolia</i>	Wht	4 - 20"	FU - PS	DM-D
Prairie Blue-eyed Grass	<i>Sisyrinchium campestre</i>	Blue	4 - 12"	FU - PU	DM-D
Prairie Coreopsis	<i>Coreopsis palmata</i>	Yel	18 - 30"	FU - PU	M-D
Prairie Larkspur	<i>Delphinium virescens</i>	B/W	20 - 48"	FU - PS	DM-D
Prairie Onion	<i>Allium stellatum</i>	Lav	10 - 20"	FU - PU	M-D
Prairie Phlox	<i>Phlox pilosa</i>	Pnk	12 - 24"	FU - PU	WM-D
Prairie Red-Root	<i>Ceanothus herbaceus (ovatus)</i>	Wht	24 - 36"	FU - PS	DM-D
Prairie Sage	<i>Artemesia ludoviciana</i>	Grn	12 - 36"	FU - PU	M-D

Wild Flowers

Common Name	Species Name	Color	Height	Light	Soil
Prairie Smoke	<i>Geum triflorum</i>	Red	6 - 13"	FU - PU	WM-D
Prairie Violet	<i>Viola pedatifida</i>	Vlt	4"	FU - PS	M-DM
Purple Prairie Clover	<i>Dalea purpurea</i>	Pur	12 - 36"	FU - PU	M-D
Rough Blazing Star	<i>Liatris aspera</i>	Pur	24 - 36"	FU - PU	M-D
Round-lobed hepatica	<i>Hepatica americana</i>	B/W	4 - 6"	PS - PS	M-DM
Showy Goldenrod	<i>Solidago speciosa</i>	Yel	24-36"	FU - PU	M-D
Showy Tick Trefoil	<i>Desmodium canadense</i>	Pur	24 - 60"	FU - PS	WM-DM
Silky Aster	<i>Aster sericeus</i>	Pur	12 - 24"	FU - PU	DM-D
Sky Blue Aster	<i>Aster oolentangiensis</i>	Blue	12 - 48"	FU - PU	M-D
Smooth Blue Aster	<i>Aster laevis</i>	Blue	36 - 60"	FU - PU	WM-DM
Stiff Goldenrod	<i>Solidago rigida</i>	Yel	24-36"	FU - PU	WM-D
Tall Thimbleweed	<i>Anemone virginiana</i>	Wht	12 - 36"	FU - PS	M-D
Thimbleweed	<i>Anemone cylindrica</i>	Wht	24 - 36"	FU - PS	M-D
Trailing Arbutus	<i>Epigaea repens</i>	Wht	6"	PS - FS	DM-D
Twinflower	<i>Linnaea borealis</i>	Pnk	6"	PS - FS	WM-DM
Upland White Aster	<i>Aster ptarmicoides</i>	Wht	8 - 24"	FU - PU	DM-D
Western Sunflower	<i>Helianthus occidentalis</i>	Yel	24 - 36"	FU - PU	M-D
White Prairie Clover	<i>Dalea candida</i>	Wht	12 - 36"	FU - PU	M-D
White Snakeroot	<i>Eupatorium rugosum</i>	Wht	18 - 36"	FU - PS	WM-DM
Whorled Milkweed	<i>Asclepias verticillata</i>	Wht	24 - 36"	FU - PU	M-D
Wild Blue Lupine	<i>Lupinus perennis</i>	Blue	12 - 48"	FU - PU	DM-D
Wild Columbine	<i>Aquilegia canadensis</i>	R&Y	12 - 36"	FU - PS	M-D
Wild Garlic	<i>Allium canadense</i>	Pnk	6 - 24"	FU - PS	WM-D
Wild Geranium	<i>Geranium maculatum</i>	Lav	12 - 24"	PS - PS	M-DM
Wild Ginger	<i>Asarum canadense</i>	DkR	4 - 8"	PS - FS	WM-DM
Wine-leaf Potentilla	<i>Potentilla tridentata</i>	Wht	4 - 12"	FU - PU	M-D
Wintergreen	<i>Gaultheria procumbens</i>	Wht	6"	PS - FS	DM-D
Woodland Phlox	<i>Phlox divaricata</i>	Blue	6 - 24"	PS - PS	WM-DM
Woodland Strawberry	<i>Fragaria vesca</i>	Wht	6-10"	FU - PS	WM-D
Woodland Sunflower	<i>Helianthus strumosus</i>	Yel	24 - 60"	FU - PS	WM-DM
Yarrow	<i>Achillea millefolium</i>	Wht	18 - 30"	FU - PS	WM-DM
Yellow Coneflower	<i>Ratibida pinnata</i>	Yel	36-48"	FU - PU	M-DM
Zig Zag Goldenrod	<i>Solidago flexicaulis</i>	Yel	12 - 36"	PS - PS	W-DM
American Bugleweed	<i>Lycopus americanus</i>	Wht	12 - 24"	FU - PU	W-WM
Bearberry	<i>Arctostaphylos uva-ursi</i>	Pnk	24 - 72"	FU - PU	D
Blue Vervain	<i>Verbena hastata</i>	Blue	24 - 60"	FU - PS	W-M
Boneset	<i>Eupatorium perfoliatum</i>	Wht	36 - 48"	FU - PS	W-WM
Bottle Gentian	<i>Gentiana andrewsii</i>	Blue	18 - 30"	FU - PU	WM-M
Bunch Berry	<i>Cornus canadensis</i>	Wht	4 - 10"	PS - FS	WM-M
Cardinal Flower	<i>Lobelia cardinalis</i>	Red	24 - 60"	FU - PU	W-WM
Crooked Stem Aster	<i>Aster prenanthoides</i>	Lav	12 - 36"	FU - PU	WM-M
Cup Plant	<i>Silphium perfoliatum</i>	Yel	36 - 96"	FU - PS	WM-M
Field Mint	<i>Mentha arvensis</i>	Wht	12 - 24"	FU - PS	W-M
Flat-topped Aster	<i>Aster umbellatus</i>	Crn	12 - 60"	FU - PS	W-M
Great Blue Lobelia	<i>Lobelia siphilitica</i>	Blue	12 - 48"	FU - PU	W-M
Great St. John's Wort	<i>Hypericum pyramidatum</i>	Yel	48 - 60"	FU - PS	WM-M
Ironweed	<i>Vernonia fasciculata</i>	Pur	36 - 60"	FU - PU	WM-M

Wild Flowers

Common Name	Species Name	Color	Height	Light	Soil
Jack in the Pulpit	<i>Arisaema triphyllum</i>	Grn	12 - 36"	PS - PS	WM-M
Large-flowered trillium	<i>Trillium grandiflorum</i>	Wht	8 - 12"	PS - PS	WM-M
Marsh Marigold	<i>Caltha palustris</i>	Yel	19 - 30"	PS - FS	W-WM
Monkeyflower	<i>Mimulus ringens</i>	Vlt	12 - 36"	FU - PU	W-WM
Northern Blue Flag Iris	<i>Iris versicolor</i>	Blue	18 - 30"	FU - PU	W-M
Northern Plains Blazing Star	<i>Liatris ligulistylis</i>	Pur	36 - 60"	FU - PU	WM-M
Obedient Plant	<i>Physostegia virginiana</i>	Pnk	36 - 60"	FU - PU	W-M
Partridgeberry	<i>Mitchella repens</i>	Wht	24 - 48"	PS - FS	WM-M
Purple Meadow Rue	<i>Thalictrum dasycarpum</i>	Crn	40-50"	FU - PU	WM-M
Sneezeweed	<i>Helenium autumnale</i>	Yel	24 - 60"	FU - PS	W-WM
Spotted Joe-Pye Weed	<i>Eupatorium maculatum</i>	Ros	36 - 60"	FU - PS	W-WM
Swamp Aster	<i>Aster puniceus</i>	Wht	24 - 60"	FU - PS	W-WM
Swamp Milkweed	<i>Asclepias incarnata</i>	Red	36 - 60"	FU - PU	W-M
Thick Spike Blazing Star	<i>Liatris pycnostachya</i>	Pur	24 - 48"	FU - PU	W-M
Turtlehead	<i>Chelone glabra</i>	Crn	24-36"	FU - PU	W-WM
Virginia Bluebells	<i>Mertensia virginiana</i>	Blue	12 - 24"	PS - PS	WM-M
White False Aster	<i>Boltonia asteroides</i>	Wht	36 - 60"	FU - PU	W-WM
Wild Goldenglow	<i>Rudbeckia laciniata</i>	Yel	36 - 96"	FU - PS	WM-M

Grasses

Common Name	Species Name	Color	Height	Light	Soil
Big Bluestem	Andropogon gerardii	Pur-Grn	36 - 48"	FU - PS	WM-D
Bottlebrush Grass	Elymus hystrix	Grn	24 - 36"	FU - PS	M-DM
Canada Wild Rye	Elymus canadensis	Grn	36 - 48"	FU - PS	WM-D
Fox Sedge	Carex vulpinoidea	Grn	12 - 36"	FU - PS	W-DM
Indian Grass	Sorghastrum nutans	Amber	36 - 54"	FU - PS	M-D
June Grass	Koeleria macrantha (crinata)	Grn	12 - 24"	FU - PU	DM-D
Kalm's Brome	Bromus kalmii	Grn	12 - 36"	FU - PS	WM-DM
Little Bluestem	Schizachyrium scoparium	Amber	24 - 36"	FU - PS	M-D
Long Beaked Sedge	Carex sprengeii	Grn	12 - 24"	PU - PS	WM-DM
Path Rush	Juncus tenuis	Brown	2 - 14"	FU - PS	WM-D
Pennsylvania Sedge	Carex pensylvanica	Brown	6 - 12"	FU - SH	M-D
Porcupine Grass	Stipa spartea	Purplish	36 - 48"	FU - PU	DM-D
Prairie Dropseed	Sporobolus heterolepis	Grn	24 - 36"	FU - PU	WM-D
Sand Dropseed	Sporobolus cryptandrus	Purplish	24 - 36"	FU - PU	DM-D
Side Oats Grama	Bouteloua curtipendula	Red-Grn	24 - 36"	FU - PU	M-D
Switch Grass	Panicum virgatum	Purplish	36 - 60"	FU - PU	WM-D
Awl Fruit Sedge	Carex stipata	Grn	12 - 36"	FU - SH	W-M
Baltic Rush	Juncus balticus (arcticus)	Grn	12 - 36"	FU - PU	WM-M
Bebb's Sedge	Carex bebbii	Grn	24 - 36"	FU - PU	WM-M
Bladder Sedge	Carex intumescens	tan	24 - 36"	FU - PS	W-M
Blue Joint Reedgrass	Calamagrostis canadensis	Straw	36 - 48"	FU - PS	W-M
Bottlebrush Sedge	Carex comosa	Grn	12 - 24"	FU - PU	W-WM
Caterpillar Sedge	Carex crinita	Grn	24 - 48"	FU - PS	W-WM
Creeping Spikerush	Eleocharis palustris	Brown	12 - 24"	FU - PU	W-WM
Fowl Manna Grass	Glyceria striata	Grn	36 - 48"	FU - PS	W-M
Fringed Brome	Bromus ciliatus	Grn	24 - 48"	FU -SH	W-WM
Giant Manna Grass	Glyceria grandis	Purplish	36 - 48"	FU - PU	W-WM
Green Bulrush	Scirpus atrovirens	Brown	36 - 54"	FU - PU	W-WM
Hard Stem Bulrush	Schoenoplectus (Scirpus) acutus	Grn	36 - 54"	FU - PU	W-WM
Hop Sedge	Carex lupulina	Grn	12 - 48"	FU - PS	W-WM
Lake Sedge	Carex lacustris	Grn	24 - 42"	FU - PU	W-WM
Lance Fruit Oval Sedge	Carex scoparia	tan	6 - 30"	FU - PU	W-M
Porcupine Sedge	Carex hystrixina	Grn	12 - 36"	FU - PU	W-WM
Prairie Cordgrass	Spartina pectinata	Yel	36 - 54"	FU - PU	W-M
Rattlesnake Manna Grass	Glyceria canadensis	Grn	24 - 36"	FU - PS	W-WM
River Bulrush	Scirpus fluviatilis	Brown	36 - 54"	FU - PU	W-WM
Sand-bracted Sedge	Carex muhlenbergii	Grn	12 - 36"	FU - PS	D
Small Fruited Bulrush	Scirpus microcarpus	Brown	24 - 36"	FU - PU	W-WM
Soft Rush	Juncus effusus	Brown	18 - 48"	FU - PU	W-M
Soft Stem Bulrush	Schoenoplectus (Scirpus) validus	Brown	36 - 54"	FU - PU	W-WM
Sweet Flag	Acorus calamus	Yel	12 - 36"	FU - PU	W-WM
Sweet Grass	Hierochloe odorata	Grn	12 - 24"	FU - PS	W-M
Three Square Bulrush	Schoenoplectus (Scirpus) pungens	Brown	24 - 48"	FU - PU	W-WM
Torrey's Rush	Juncus torreyi	Brown	12 - 24"	FU - PU	WM-M
Tussock Sedge	Carex stricta	Grn	12 - 36"	FU - PS	W-WM
Wool Grass	Scirpus cyperinus	Brown	36 - 54"	FU - PU	W-WM

Ferns

Common Name	Species Name	Avg. Height	Light	Soil
Sensitive Fern	<i>Onoclea sensibilis</i>	18"	part sun to full shade	WM
Leatherwood Fern	<i>Dryopteris marginalis</i>	20"	part to full shade	WM-M
Maidenhair Fern	<i>Adiantum pedatum</i>	24"	part to full shade	W-M
Cinnamon Fern	<i>Osmunda cinnamomea</i>	30"	full sun to full shade	W-M
Royal Fern	<i>Osmunda regalis</i>	30"	full sun to full shade	W-M
Toothed Wood Fern	<i>Dryopteris spinulosa</i>	30"	part to full shade	W-M
Maidenhair Spleenwort	<i>Asplenium trichomanes</i>	30"	full sun to part shade	WM-M
Lady Fern	<i>Athyrium felix-femina</i>	36"	part to full shade	WM-M
Interrupted Fern	<i>Osmunda claytoniana</i>	39"	full sun to full shade	M
Ostrich Fern	<i>Matteuccia struthiopteris</i>	48"	part to full shade	W-M