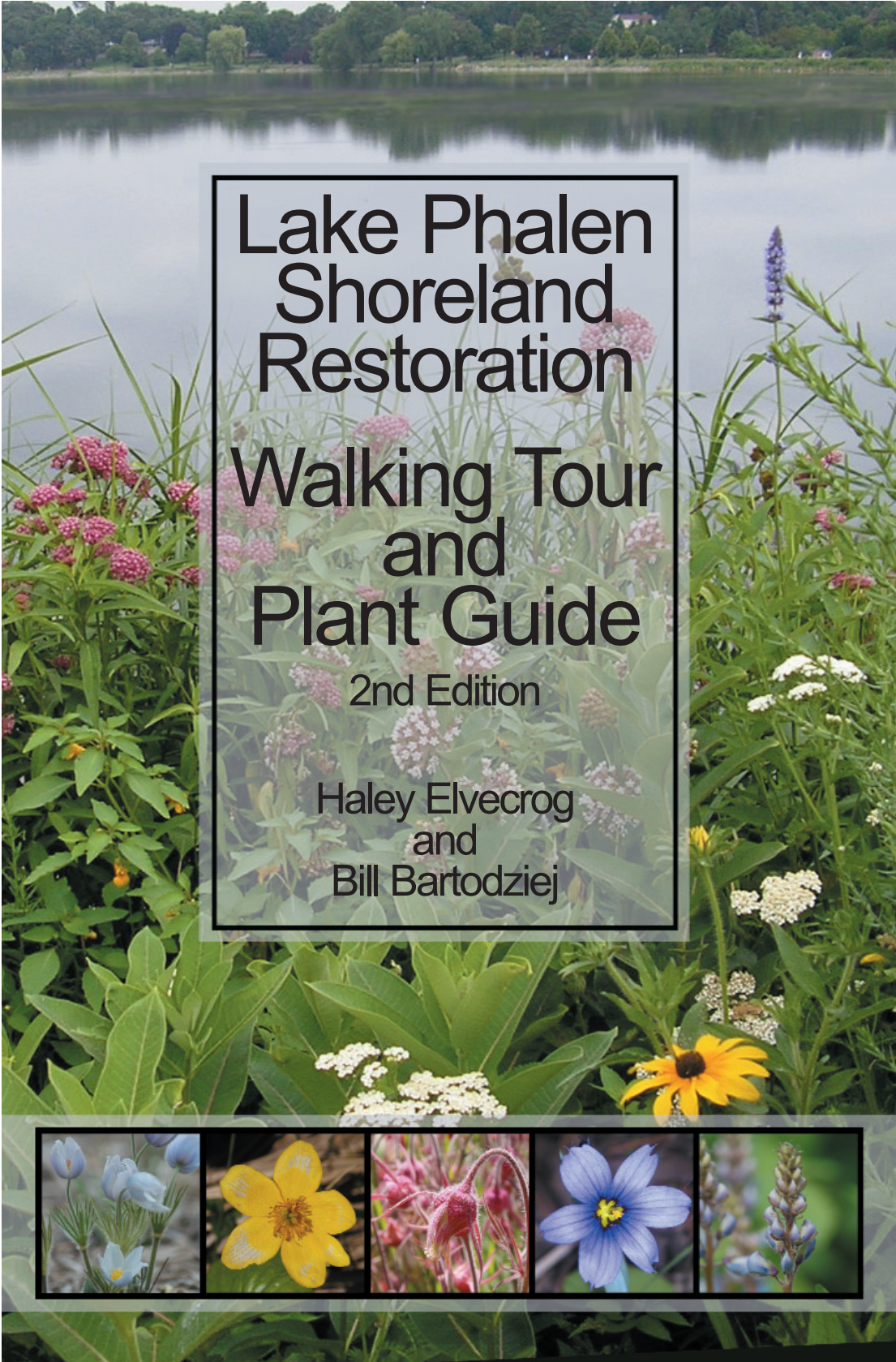


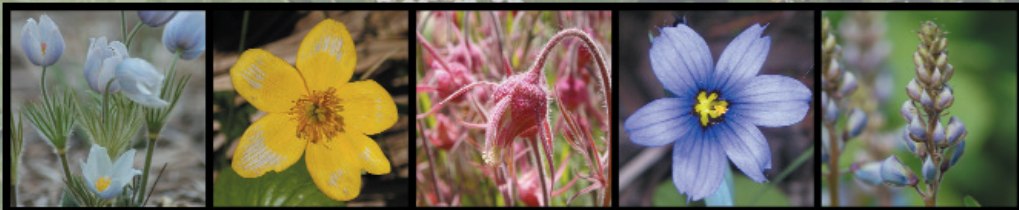


Lake Phalen Shoreland Restoration

Walking Tour and Plant Guide

2nd Edition

Haley Elvecrog
and
Bill Bartodziej







The RWMWD is a grouping of five smaller watersheds (Phalen Chain of Lakes, Beaver Lake, Battle Creek, Fish Creek, and East St. Paul) that drain to the Mississippi River just downstream of downtown St. Paul. We are a special purpose local unit of government with a mission to protect and improve water resources and water related environments within our jurisdiction. For more information, you can visit our website at www.rwmwd.org, or call our office at 651-792-7950.

Code: RWM-003.gui (2008)



Availability

The Ramsey-Washington Metro Watershed District is distributing this guide at a cost of \$10, including tax, shipping and handling. Orders of ten or more guides receive a 20% discount. Please call 651-792-7950 to order, or visit www.rwmwd.org to download an order form.

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We are extremely appreciative of the following professionals who gave their valuable time and provided many suggestions that improved this 2nd Edition: Mark Gernes, John Hiebert, Jason Husveth, Meghan Manhatton, Beth Nixon, and Gregg Thompson. Watershed District staff worked on this guide and gave excellent input. We thank Rhianna O'Shea for assistance with the graphic design.

Guide Content

Certain native plant descriptions were used with permission from the Minnesota Department of Natural Resource's Restore Your Shore CD. This is MN DNR copyright material. The remaining elements of the description pages were compiled using a variety of plant guides referenced at the end of this book. All restoration site descriptions and maps are products of the Ramsey-Washington Metro Watershed District.

Photographs

A majority of the plant photographs were taken by Haley Elvecrog and Carrie Mack and are property of the Ramsey-Washington Metro Watershed District. Bill Bartodziej photo-documented the restoration sites. Other photographs were contributed by: Paul Berry, Virginia Gaynor, Mark Gernes, H.B. Fuller Company, Bonnie Harper-Lore, Jason Husveth, H. H. Iltis, Emmet Judzewicz, Rob Langer, Prairie Moon Nursery, and Daniel Wovcha.

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Main contributors

Simba Blood contributed to the guide layout and conducted plant literature searches. She has been involved with the Phalen Shoreland Restoration Project for seven years, leading volunteers and overseeing all aspects of maintenance. Carrie Mack photographed a majority of the new plant species appearing in this addition. She also updated the site maps. Their professional approach and willingness to work as a team was valued, and helped to improve this edition. Both are Watershed District employees.

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Phalen Area Road Map



Introduction

Beginning in 2001, the Phalen shoreline has undergone immense changes. These changes have generated many questions about the new appearance of the shoreland, ecological restoration, and plants that are now found around the lake. This book provides a field guide to the shoreland restoration project. It also describes plants that have become established along the Lake Phalen shoreline. It presents close-up photographs and descriptions of 126 native shoreland plants, as well as 45 common invasive weeds and how they are managed. Watershed residents, educators, and local school students interested in Lake Phalen's natural shores will find this book most useful.

Background and History

Lake Phalen is 200 acres in size and is the focal point of Phalen Regional Park. The City of St. Paul owns all parklands surrounding the lake and the 2.8 miles of shore. Currently, the park receives approximately one-half million visits on an annual basis. It is one of the most popular parks in the Twin Cities metropolitan area. Patrons use bike and walking trails that encircle the entire lake. Lake Phalen is home to the only public swimming beach in St. Paul. Fishing is popular from shore, by boat, and through the ice.

The Phalen shoreline has a long history of substantial alterations. In 1899, immediately after park acquisition, shore “improvements” were being made with a massive steam-driven bucket dredge (Figure 1). An early city report acknowledged that “dredge material is used for filling low, marshy land adjacent to the lakeshore, and these now unsightly places are being converted to lawn spaces.” Soon after, a flock of sheep was introduced to manicure the lake edge. These activities spurred shore erosion and, beginning in the 1920s, rock riprap was used to combat soil loss along the lake edge (Figure 2).

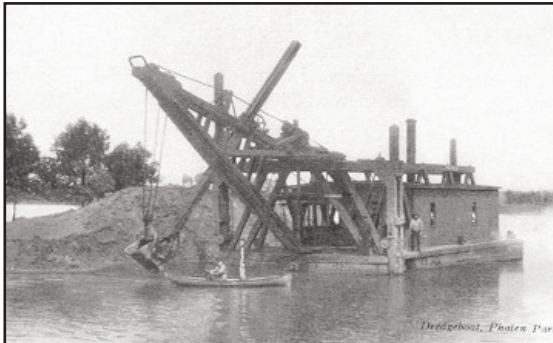


Figure 1. A dredging machine working on the shore of Lake Phalen - 1901.

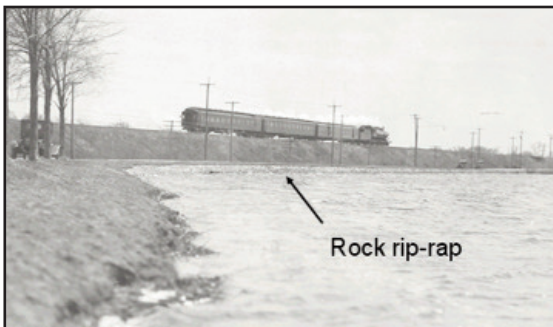


Figure 2. An eroded shore in the foreground and rip rap in the background - 1920's photo.

By the late 1990s, 80% of the Lake Phalen shoreline was in a highly degraded state (Figure 3). A majority of the shoreline consisted of various blends of riprap, erosion, invasive weed species, and turf grass. In several areas, erosion was causing the shore banks to fall into the lake, resulting in steep and hazardous drop offs



Figure 3. A typical stretch of eroded shore - 1999.

near the walking path. Thus safety, bank stability, water quality, fish and wildlife habitat, and aesthetics were all being compromised by past shore alterations and traditional or limited shoreland management practices.

Ecological Restoration of Shorelands

Over the last decade, the ecological restoration of lake shorelands has become more common in the mid-western United States. This approach relies on a variety of native plant species and an assortment of bio-engineering techniques to stabilize shores. The overriding goal is to establish a sustainable natural shoreland containing a diverse mix of native plant species. This type of shoreland restoration provides benefits on many fronts; it is economical, creates valuable fish and wildlife habitat, reduces erosion which helps to improve water quality, and adds to the aesthetic appeal of these critical habitat areas. Many government agencies and individual shoreland owners are opting for ecological restoration instead of the more traditional approaches that use rock riprap and sea walls for stabilization.

The Lake Phalen Shoreland Ecological Restoration Project

In 2000, the Ramsey-Washington Metro Watershed District, City of St. Paul, and the Minnesota Department of Natural Resources (DNR) began a long-term ecological restoration project on the shores of Lake Phalen. This approach was chosen due to it being both economical and comprehensive - addressing erosion, habitat, lakeshore use, and aesthetic issues at the same time. Project partners came together to develop a long-term plan. The main goals were to: (1) stabilize the shore through the reintroduction of native plant communities, (2) incorporate informal lake access points, and (3) educate and provide opportunities for watershed residents to become involved in the project. Substantial funding was secured through the DNR's Shoreland Habitat Restoration Grant Program.

Project Results

From 2001 to 2008, between 1,000 and 1,500 feet of lakeshore has been restored on an annual basis. A wide variety of ecological restoration techniques have been implemented. Altogether, this project has resulted in approximately two miles (70% of the shore) of stable, ecologically diverse, and visually attractive shoreland that now highlights one of our premiere lakes in the region (Figure 4). To date, this is one of the largest lake shoreland ecological restoration projects in the state of Minnesota.

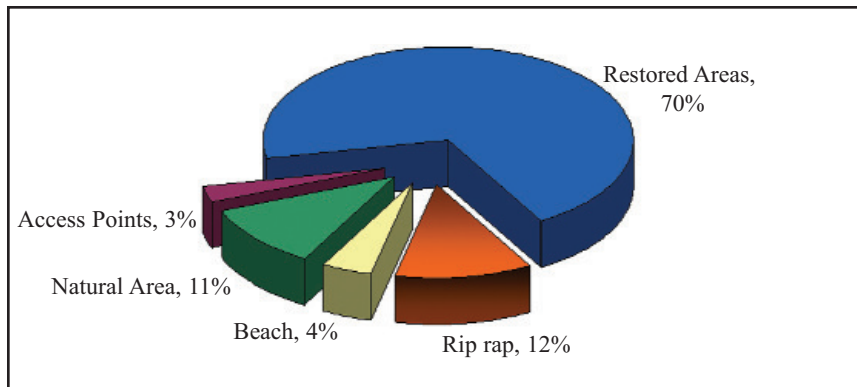


Figure 4. Current breakdown of Lake Phalen shoreland (2008). Total shore length is approximately 3 miles.

Since plan implementation, safety hazards have been eliminated, erosion has been reduced, fish and wildlife habitat has improved, park patrons have greater access to the lake, and a multitude of established native flowers and grasses have enhanced aesthetics. Observations by natural resources managers suggest that certain fish and wildlife species are using the restoration areas. For instance, bluegill (*Lepomis macrochirus*) have constructed numerous spawning beds amongst bulrushes. Leopard frogs (*Rana pipiens*) have colonized wet meadow transitional zones. Great blue heron (*Ardea herodias*) and other wading bird species are commonly seen feeding on small fish associated with newly established sedges and bulrushes (Figure 5). Butterflies and bees are now a common sight along the shore, associated with wildflowers in the transitional and upland plant communities.



Figure 5. A great blue heron taking cover in a restored shoreland area.



Figure 6. Fire is used to stimulate the growth of native prairie plants and to control weeds.

Watershed and City staff continue to maintain the shoreland restoration areas, weeding, supplementing with additional plant materials, and performing prescribed burns (Figure 6). Park patrons frequently use the new access points to fish, bird watch, and get close to the water (Figure 7).



Figure 7. A shore access point on the Southwest side.

In addition to the ecological improvements to the lake, the project has drawn attention to Lake Phalen's status as an exceptional regional water resource in the City of St. Paul. Citizens and students from neighborhoods around the lake gain a sense of stewardship by learning about the ecosystem in the classroom and by participating in a variety of field exercises.

Civic and school groups have donated approximately 50% of the field labor used in this effort. Since 2001, over 1,800 students and 17 local schools have given several thousand hours to the ecological restoration (Figure 8). The Ramsey County Corrections

Greenhouse Facility provided over 90% of the native plants used in this restoration. Work crews from this facility have also assisted with soil grading, plant installation, weeding, and fence construction. Local newspapers and television news programs have featured this project, highlighting ecological lakeshore restoration as a new



Figure 8. Local school students assisting with plant installation.

approach to combating the longstanding problem of shore erosion. Natural resources managers have presented the technical details of this project at scientific meetings, conducted field tours, and given lectures to university classes.

How to use this guide

The first section of this guide provides a look at the ecological restoration efforts that have taken place at individual shoreland sites, describing methods, pre- and post- restoration conditions, and ongoing management issues. The second section provides a handy reference to native and non-native plant species found around the lake. Herbaceous plants are the main focus of this guide.

Walking Tour and Restoration Site Summaries

When touring the lake, the reader can page through the site summaries and learn about specific ecological restoration activities for each shoreline area: restoration timeline, overall goals, and ongoing management challenges. This section is composed of maps, photos, and restoration outlines. Each summary contains a close-up aerial photograph with the boundaries of the restoration site outlined as well as interesting shoreline photos. Sites are described along with a brief overview of the restoration process. Some of the descriptions contain technical terms that may not be understood by those unfamiliar with lakeshore restoration. These terms are defined in the glossary at the end of the guide.

Plant Guide

This section contains high quality photographs and descriptions for 171 native plant species and invasive weed species, and locations where individual species can be found around Lake Phalen. For most of the wildflowers, each species is depicted during spring, in the mid part of the growing season, and then at flowering. This edition also includes a fall-winter foliage section that contains selected species that possess lasting leaf and flower parts during the dormant season. Photographs include the month in which the picture was taken during the growing season. This phenological information will provide a better understanding of when to look for certain plant characteristics and assist students and wildflower enthusiasts in identifying plants during various stages of development. The descriptions include the plant's scientific name, environmental requirements, leaf and flower characteristics, height, bloom period, and interesting notes or management techniques. Each plant page includes a small outline of the lake. The small flower located on the lake map outline represents the site where a plant is most likely to be found (Figure 9). Plant nomenclature follows the US Department of Agriculture, Natural Resources Conservation Service PLANTS Database.

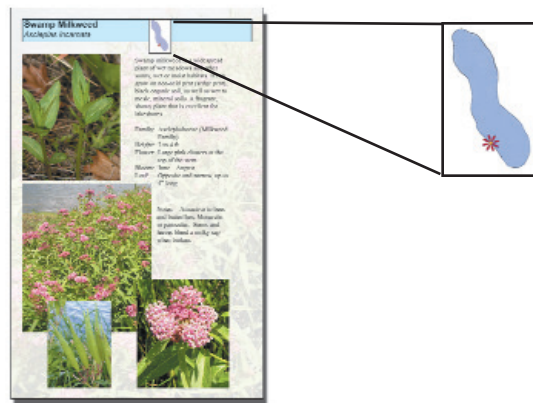


Figure 9. Map indicating where a plant species is most likely to be found.

The plant guide section is organized into five main subsections: Emergent Plants, Wet Meadow Shoreline Plants, Prairie and Oak Savanna Plants, Invasive Plants, and Fall-Winter Foliage. Figure 10 (page 9) delineates the major plant zones along the Phalen shoreland.

I. Emergent Plants

Emergent plants are plants that have adapted to living in standing water, commonly known as the emergent zone. These plants typically grow in conditions where water levels are between six inches and three feet deep. Emergent plants provide important habitat for fish and wildlife. Some examples of emergent plants include white water lily (*Nymphaea odorata*), broadleaf arrowhead (*Sagittaria latifolia*) and hardstem bulrush (*Schoenoplectus acutus*).



II. Wet Meadow Shoreline Plants



Wet meadow shoreline plants grow in areas that are constantly moist. This area is known as the transitional or wet meadow zone. It is located between the emergent zone and the upland area. The plants in this zone are adapted to occasional inundation when water levels rise. The transitional zone is typically at the base of the shoreline slope; therefore, wet meadow plants are extremely important for shoreline stabilization. Some examples of wet meadow plants include blue flag iris (*Iris versicolor*), river bulrush (*Schoenoplectus fluviatilis*), and swamp milkweed (*Asclepias incarnata*).

III. Prairie and Oak Savanna Plants

Pre-settlement, the upland areas along Lake Phalen mainly consisted of prairie and oak savanna. A large percentage of the restored buffer area falls within these two habitat types. The soils in these uplands are typically well drained and dry most of the year. Prairie and savanna forb species are common and diverse, providing a colorful, aesthetically pleasing natural buffer area around the lake. Grass and sedge species compose the base for these habitats. Together, forb, grass, and sedge species provide food and cover for a wide variety of insect and other animal species. Butterflies and song birds are the showiest inhabitants. Some examples of prairie plants include purple coneflower (*Echinacea purpurea*), Indian grass (*Sorghastrum nutans*), and black-eyed Susan (*Rudbeckia hirta*). Sprengel's sedge (*Carex sprengelii*), columbine (*Aquilegia canadensis*), and spiderwort (*Tradescantia occidentalis*) are abundant in Phalen's oak savannas.



IV. Invasive Plants



Invasive plants are nuisance weed species that are not wanted in natural areas. Most of them are not native to Minnesota. Invasive plants are typically aggressive and compete with the native vegetation for sunlight, moisture and nutrients. These plants are controlled through a variety of techniques including: hand pulling, cutting with a string trimmer, prescribed burns, and application of chemical herbicide. Some examples of invasive plants include reed canary grass (*Phalaris arundinacea*), common buckthorn (*Rhamnus cathartica*), and spotted knapweed (*Centaurea stoebe*).

V. Fall-Winter Foliage

New to this 2nd Edition are photos of selected native plant species in the fall and winter months. This addition is particularly important to educators that bring groups of students out in the field during this time of year, when school is in session. Even though plants are not actively growing and are more difficult to identify, students will begin to critically assess plant shapes, structures, and community diversity. This group of photos highlights the interesting and beautiful shapes of our native shoreland plants and the critical habitat they provide during the dormant season.



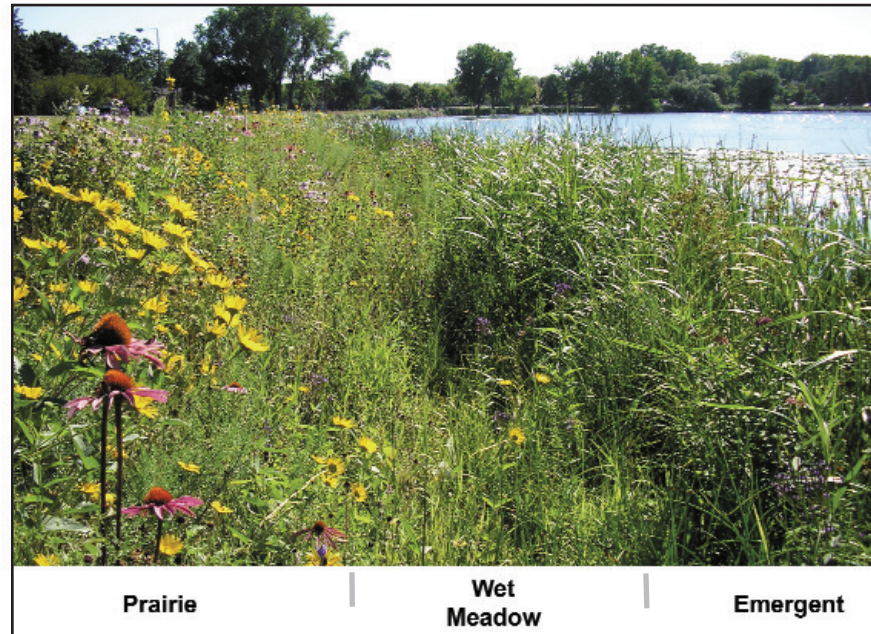
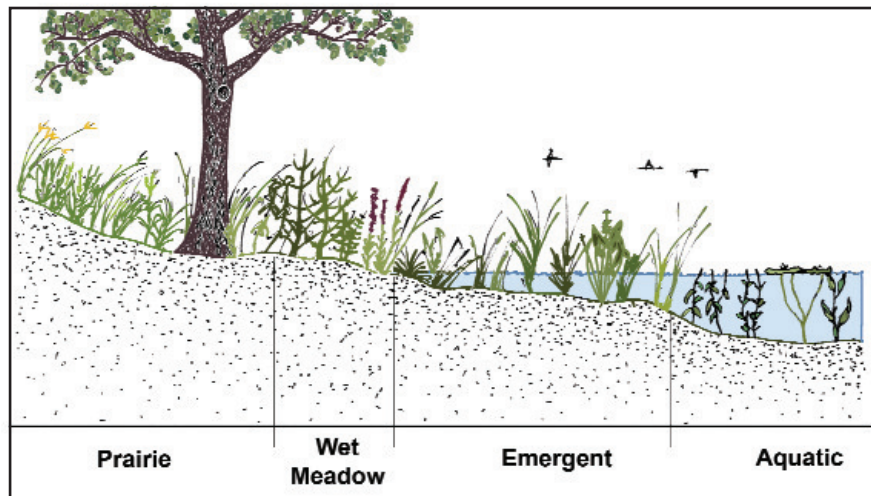


Figure 10. A line drawing and photo delineating shoreland plant zones.

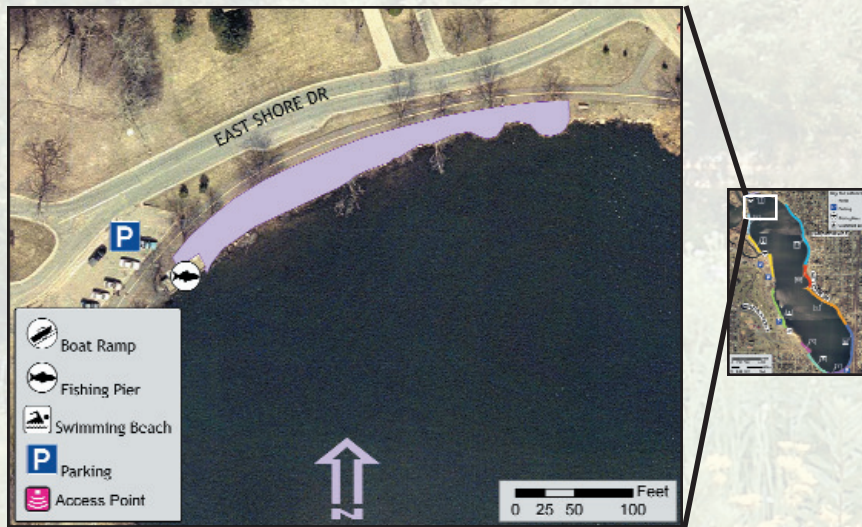
Walking Tour



Phalen Walking Tour Map



Walking path distance around the lake is approximately 3 miles




Site Boundary

Shore length = 366 feet
Average width = 23 feet



2002 - Prior to Restoration

Shore areas from the pathway to the water were eroded down to bare soil. The worst areas were located close to the observation platform. This was a popular spot for park patrons to feed ducks and geese. Observations indicated that the high bird densities along this shore were contributing

large amounts of fecal matter to the lake. The goals for restoring this site were to establish an upland plant buffer and to greatly reduce or eliminate the bird feeding activities.

2003 - Restoration Begins

Restoration efforts began at Site 1 in the spring of 2003. Educational signs and pamphlets were placed on the site explaining the problems associated with feeding the ducks and geese. Soil was used to fill eroded gullies near the observation platform. Turf grass along the pathway was treated with an herbicide and covered with a 2" layer of shredded hardwood mulch. A diverse mix of savanna, prairie, and wet meadow species were planted through the mulch layer. Two large invasive weed trees were cut down and placed along the shore to create fish and wildlife habitat. The entire site was temporarily fenced in order to prevent foot traffic within the plantings and to keep the geese and ducks from eating the new plants.

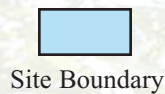
Current Conditions

The upland buffer is becoming well established. This area is a great place to find columbine in the early summer and a variety of asters in the fall. Just off the pathway, a strip of little bluestem marks the edge of the buffer. All bare areas have become revegetated. With the natural buffer well established, ducks and geese do not frequent this area of the shore. Waterfowl feeding has substantially diminished. Prescribed burns have been used as a tool to manage the buffer. The temporary fence has been removed. The buffer will be closely monitored to look for signs of foot traffic or bird feeding damage.



Site Challenges	Management Techniques
Erosion due to foot traffic in the planting	Temporary fencing - now removed
Bird feeding	Education, city ordinance, natural buffer
Possible purple loosestrife invasion	Monitoring and spot treatment

Site 2 - Northwest Side



Shore length = 697 feet
Average width = 15 feet



2007 - Prior to restoration
This shoreland was characterized by scattered invasive tree species, primarily Siberian elm, pockets of large riprap (1-3' diameter), and cut banks with exposed soil from the top of the slope (2:1 roughly) down to the water's edge.

A substantial amount of foot traffic has been the main factor in creating the cut banks. The riprap was functioning marginally to stabilize this segment of shore. Exposed tree roots and bare areas without vegetation indicated that soil was being transported into Lake Phalen.



2008 - Restoration Begins

In April 2008, invasive tree species were removed from the shore edge and an excavator was used to reposition the existing riprap and to regrade the slope. The rock was placed at the toe of the slope, and a wet meadow fringe was created immediately behind the rock to support a mix of wetland species. These species were introduced via pre-vegetated mats the size of a plant flat container. The upland slope was seeded with a native plant mix and then covered with biodegradable erosion control blanket. School students assisted with the installation of 2" native plant plugs. Species that are difficult to establish from seed were favored in the plug planting. This activity was conducted in conjunction with school lessons on lake ecology and ecological restoration.

Site Challenges

Management Techniques

Erosion due to foot traffic in plantings	Temporary fencing, education
Annual weed invasion	Close monitoring, spot treatment
Siberian elm seedlings	Hand pulling, prescribed fire



Site Boundary

Shore length = 1,589 feet
Average width = 31 feet



2003 - Prior to Restoration

This long stretch consisted of turf grass, riprap, and a degraded upland prairie restoration. This is a very popular spot along the shore because of a fishing pier and the Pavilion commons area. The goals for Site 3 included expanding and improving the upland

buffer, repositioning riprap in areas with a shallow in-lake slope, and establishing extensive stands of emergent plants.

2004 -Restoration Begins

Northern section - A portion of the path along the lake was removed in order to create a more substantial buffer. After the asphalt was hauled away, the site was regraded to create at least a 5:1 slope down to the water. All turf grass in this segment was treated and then covered with a 2-inch layer of soil. Native prairie and savanna seed mixes were incorporated into the soil. Steeper slopes were covered with erosion control blanket. Student volunteers helped install wet meadow plant plugs along the shore. This shore segment is sheltered, sandy, and remains shallow (< 2ft.) for at least ten feet offshore. Close to 1,000 one-gallon containers and prevegetated mats of emergent plant species (e.g., bulrush, bur-reed, spikerush) were installed in this shallow water zone.

Southern section - Rrap was repositioned along this shore with the main purpose of stabilizing the toe (or base) of the slope. An excavator was used to reduce the slope from the path to the water's edge. Directly in front of the Pavilion, over 500 cubic yards of soil was hauled away to create a wider wet meadow transitional zone. After regrading, all slopes in this section were seeded and covered with erosion control blanket. Student volunteers planted thousands of upland prairie plugs. The emergent zone was planted mainly with a mix of hardstem and softstem bulrush.

Current Conditions

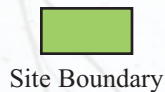
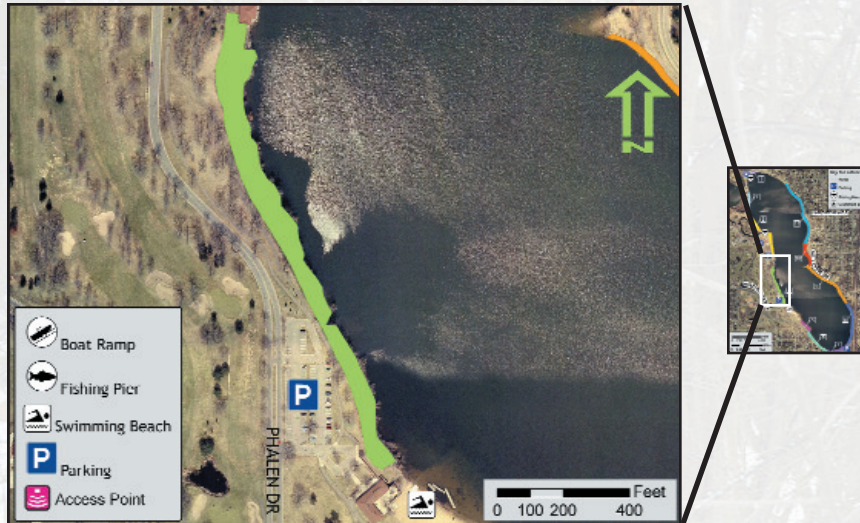
The cover crop of rye grass was the most evident plant during the first growing season. Plant plugs had over a 90% rate of survival; some species flowered during the first year. Herbaceous ground cover under the oak trees is becoming well established. The grass species responded well to a prescribed burn. The emergent zone plantings did exceptionally well during the second half of the growing season. In fall of the first year, migrating ducks and muskrat fed heavily on the young stands of bulrush. Herbivory has been a chronic problem, especially muskrat feeding.



Muskrat have reduced the emergent plant cover by over 95 percent. Because of the impact of these animals, no future emergent plantings will be attempted.

Site Challenges	Management Techniques
Emergent plant establishment due to muskrat feeding	Fencing was tried and found ineffective in controlling feeding
Perennial weed invasion	Close monitoring, spot treatment
Siberian elm seedlings	Hand pulling, prescribed fire every other year

Site 4 - West Wooded Slope



Site Boundary

Shore length = 1,378 feet
Average width = 52 feet



2007 - Prior to Restoration

This section of shoreline stretches from the Boat House on the north, to the Beach House at the southern edge. Site 4 is steeply sloped and heavily wooded, much like Site 11 - the Northeast Wooded Slope. The large trees on the slope include bur oak, red oak, and basswood; while cottonwood and willow occur at the shore.

While some native species such as choke cherry, box elder, and small oaks appear in the understory, this level of the forest was dominated by invasive Tatarian honeysuckle near the beach house, and buckthorn in the area closest to the boat house. Much of the slope is stable, however a few areas have developed cut banks at the water's edge. A large cut bank has developed next to the inlet pipe from the Beach House parking lot.



2008- Restoration Begins

In January-February 2008, invasive trees and shrubs - primarily Tatarian honeysuckle and common buckthorn - were controlled on the steep hill slopes. Plants were cut just above the soil surface, material was hauled off site, and the stumps were treated with an herbicide. This was a joint effort among Watershed, City of St. Paul, and Ramsey County Corrections work crews. If funding allows, a native plant seed mix will be spread on the slope to encourage a diverse ground cover. If the ground cover becomes well established over the next few years, prescribed fire will be used to stimulate this community and to control invasive woody species. Additional funding will be needed to treat the erosion at the shore.

Site Challenges	Management Techniques
Buckthorn seedling colonization	Hand pull and introduce fire
Lack of herbaceous ground cover	Seed with a native woodland - savanna mix, introduce sedge plugs
Erosion next to inlet pipes	If funding permits - stabilize toe of slope with native shrub species and bio-engineering materials




 Site Boundary

Shore length = 400 feet
 Average width = 37 feet



2000 - Prior to Restoration

This area consisted mainly of mowed turf grass and substantial bank slumping to the water's edge. Historical records point to this shore being filled with sandy lake sediments in the early 1900s. A remnant stand of three-square bulrush inter-mixed with reed canary grass and cattail was

located next to the southern edge of the site. The goal for Site 5 was to create an extensive high quality shoreland buffer with a wide wet meadow transitional zone.

2001 - Restoration Begins

Restoration efforts began in May of 2001. The old fill material was removed (over 400 cubic yards), exposing the rich, peaty wetland soils below. An 18 foot wide wet meadow zone (20:1 slope) and a 12 foot wide short grass prairie zone (5:1) were fine graded after soil removal. The wet meadow was planted with 2" and 4" plugs. The prairie zone was seeded and then planted with 2" plugs on two-foot centers. School groups and the Watershed's Natural Resources Board assisted with the planting. The emergent zone was planted with a mix of bulrushes and arrowhead. The entire site was fenced to prevent foot traffic and herbivory from waterfowl and carp.

Current Conditions

Along the upland border, the temporary fencing has been removed and replaced with cedar split-rail fencing. The plants in the upland have become well established and thousands of plants have come up from seed. When in full bloom the prairie zone is ablaze with brilliant color and fluttering with butterflies. In 2005, a prescribed burn was conducted in the prairie buffer. A large variety of prairie species responded well, and a substantial number of weedy tree seedlings were eliminated by the fire. This was a desirable management outcome.

The plants in the wet meadow zone have spread vigorously, creating a dense stand of sedge, bulrush, and flowering plants. Wildlife has returned to the area - including frogs,



turtles, and many wading bird species. The plants in the emergent zone have expanded, creating habitat for fish such as bluegills and largemouth bass. In 2007, substantial muskrat feeding damage was evident in the emergent zone. Bulrush cover will be closely monitored in future years to determine long-term effects of muskrat.

Site Challenges	Managment Techniques
Reed canary grass	Spot treatments, experiment with early and late season applications
Narrow leaf cattail	Close monitoring, spot treatments
Cottonwood and other weed tree seedlings, Canada thistle	Hand pulling, spot treatment, prescribed fire every other year




Site Boundary

Shore length = 963 feet
Average width = 23 feet



2002 - Prior to Restoration

Prior to restoration efforts, this site consisted of a degraded riprap shoreline. In some segments, bank slumping resulted in pieces of the pathway falling into the lake. This created a serious safety hazard for park patrons. Reed canary grass was growing amongst the

riprap. The goal for this site was to reposition the riprap and stabilize the bank with attractive wetland shore and short grass prairie vegetation.

2003 - Restoration Begins

Along the southern section of this shore, part of the path close to the lake was moved in order to create a more gradual slope to the water. The slope angle generally decreased from 2:1 to 4:1. Riprap was used to stabilize the toe of the slope. Coconut rolls or biologs were placed along the length of shoreline immediately behind the rock toe. The upland and wetland zones were seeded and covered with erosion control blanket. Plant plugs (2" containers) were installed by student volunteers. A Ramsey County Corrections crew helped install prevegetated mats of wetland and emergent plant species immediately behind the biologs. A temporary fence along the path was put in place to protect the young plantings from foot traffic.

Current Conditions

The plants in the transitional and upland zones have become well established and are succeeding in stabilizing the shoreline. Wetland plants have sent roots into the biologs, and have begun to colonize crevasses amongst the rock riprap. The temporary fencing has been removed and replaced with an attractive cedar split-rail fence. The prairie is full of colorful blooms in the summer. The path runs directly adjacent to the planting, making this area a great place to view the beautiful prairie and wetland wildflowers. Prescribed burns are now used to manage this buffer.



Site Challenges	Management Techniques
Cottonwood seedlings	Pulling small plants
Birdsfoot trefoil encroachment	Chemical treatment along adjoining turf grass area
Sweet clover and knapweed in the restoration	Hand pulling




 Site Boundary

Shore length = 764 feet
 Average width = 18 feet



2000 - Prior to Restoration

This area consisted mainly of turf grass and invasive weeds from the path to the water's edge. Several areas along the path were severely eroded. This was likely due to wave action, shallow rooted plants along the shore, and substantial foot traffic. Some of the eroded

areas consisted of 5 to 6 foot cut banks. Some of these were immediately adjacent to the walking path. Unsightly black fabric was laid down to prevent further erosion and temporary fencing was installed as a safety measure. The goals for this site included stabilizing the shoreline with aggressive native vegetation, revegetating the emergent zone with bulrush, and creating convenient access points to the lake.

2001 - Restoration Begins

This site was completed in two phases. The eastern section was planted in the spring and the western section was planted in the fall. The site was excavated in order to remove layers of riprap and old fill material. New soil was brought in and graded in a concave fashion to facilitate ice movement up the slope. In the transitional zone, erosion control blanket prevegetated with aggressive wetland plant species was placed along the toe of the slope. The upland zone was seeded with prairie species and covered with erosion control blanket. This area was then planted with a variety of prairie seedlings. The emergent zone was planted primarily with bulrushes. A temporary snow fence was installed in the water to reduce wave action. A temporary wire fence was also installed along the path to prevent damage from foot traffic. Access was made convenient by creating two 30-foot wide areas with limestone slabs stepping down from the pathway to the lake.

Current Conditions

The newly installed lake access points provide great places for fishing and observation. The prairie buffer area has become well established. Plants have colonized nicely. This area is dense with colorful forbs and grasses in the summer. As with other areas around the lake, muskrat have negatively impacted bulrush. Also, heavy wave action, especially in the spring, has seemed to limit emergent plant growth. The most common species immediately along the shore is river bulrush. This species has expand-



ed, and has done better than soft-stem and hard-stem bulrush. The temporary fence has been removed and replaced with cedar split-rail fence. Heavy foot traffic still exists and has caused some damage to this buffer. This area is very popular due to the parking lot only being a few steps away.

Site Challenges

Management Techniques

Limited emergent plant establishment	Replant with species resistant to muskrat feeding
Erosion due to foot traffic	Education, replant, reseed
Loss of forb species	Reseed, prescribed burns




Site Boundary

Shore length = 1,396 feet
Average width = 19 feet



2001 - Prior to Restoration

This area consisted of a riprap shoreline composed of imported rock from many different shore armoring efforts over the years. Several segments were severely eroded from heavy foot traffic and wave action. The vegetation was dominated by invasive

non-native weedy species - reed canary grass, spotted knapweed, and Canada thistle. A majority of the shoreline was unsightly, eroding, and difficult to access. The goals for this segment were to stabilize the shore, create diverse transitional and upland buffer zones, and incorporate lake access points.



Slow plant establishment along the shore

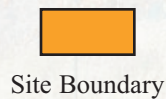
Cool season weed grasses in the upland

Muskrat damage

Replant with species resistant to muskrat feeding, increase burm height

Treat early in the growing season

Closely monitor, fill cave-ins if necessary



Site Boundary

Shore length = 1,669 feet
Average width = 15 feet



2004 - Prior to restoration

This shore segment is similar to that of Site 8 prior to restoration. Over the last several decades, a majority of the shore was armored with rock. Several areas were experiencing moderate erosion. The southern end of this site experienced heavy foot traffic, which had resulted in bare soil pathways

down to the water's edge. The plant community mainly consisted of weedy tree and shrub species and a mix of invasive herbaceous plants - reed canary grass, spotted knapweed, and Canada thistle. This shoreline segment was unsightly and provided minimal wildlife habitat. The goals for this site were to create a diverse, showy native plant buffer and to provide a large, safe lake access point towards the southern end of the segment.



Slow plant establishment in the upland due to sandy soils Reseed and use fire to stimulate prairie species

Old field bindweed invasion Hand pulling several times a year

Poor spread of grasses in the vegetated access point Reseed in fall and spring, add additional topsoil




Site Boundary

Shore length = 827 feet
Average width = 17 feet



2006 - Prior to restoration

This segment of shore primarily had reed canary grass and turf grass to the water's edge, and a mix of turf and oak savanna hill slopes in the upland portions. There were stretches of shore that had a mix of invasive species, primarily Siberian elm, buckthorn, reed canary grass and Canada thistle.

There were several pockets along the shore where bank slumping was occurring. This was more common along the northern part, closest to the oak savanna hill slopes. Recreational activity was moderate, with an informal sand beach and a park bench that attracted park patrons. A storm water pipe discharges runoff on a shoreland turf hill slope, approximately 20 feet higher in elevation than the normal lake level, and 75 feet from the shore. This pipe is fed by runoff from East Shore Drive and the adjacent neighborhood. A moderate sized gully had formed below the pipe. Gully erosion was also evident in a turf area along a pathway stretch, on the northern most part of the project site, adjacent to an oak savanna remnant.

2007 - Restoration begins

In April 2007, invasive trees and shrubs were removed by a Ramsey County Corrections labor crew. A skid steer was used to regrade the shoreland slope. Approximately 100 cubic yards of topsoil was brought in to fill gully and washout areas, and to cover treated (dead) turf grass. Soil on the steeper hill slope was spread using a large blower truck. This was the most economical way to transport soil to these areas. After the fine grading was completed, savanna, prairie, and wet meadow native seed mixes were applied to the bare soil areas. On steeper slopes and along the shore, a biodegradable erosion control blanket was used to keep seed in place, and to facilitate germination. Below the storm water pipe, three rows of wood and coconut logs were staked in place. These logs were used to slow the water flow downhill. Biologs were staked along the water's edge to protect the base of the shore slope from wave action. Wet meadow and prairie plant plugs were installed with the aid of local students. Temporary fencing was installed to reduce foot traffic.

Current Conditions

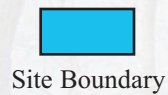
The extremely dry summer of 2007 likely affected native plant establishment; however, by the end of August, all of the restoration areas were covered by a mix of nurse crop and native plant species. Plant plug survival was approximately 80%. The hill slope immediately below the pipe is fully vegetated, and the wood fiber and coconut logs are performing well, slowing water flow. Wet meadow species are beginning to colonize the biologs along the shore. The informal beach area was preserved in the design, and a large tree trunk was added for sitting. This shore segment is being used for recreation.



Site Challenges

Management Techniques

Some mortality due to drought - 2007	Reseed and closely monitor plant establishment in future years
Weed grass invasion on hill slope areas	Herbicide treatment early in the growing season
Erosion due to water discharging from the hill slope storm water pipe	Add brush bundles to slow water flow, closely monitor



Shore length = 2,281 feet
Average width = 43 feet



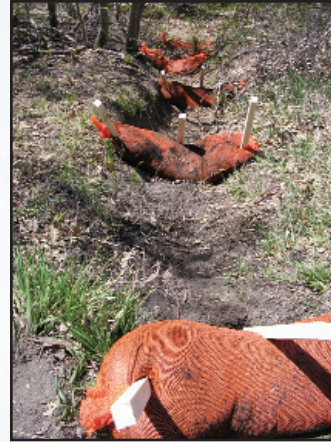
2005 - Prior to restoration

This shore segment contains four high quality remnant plant communities - emergent shoreline, dry prairie, oak savanna, and oak forest. The historical records and conditions in 2005 suggested that this segment did not experience dredging and filling activities or riprap introduction - it was relatively undisturbed. A large portion of the northeast shore is steeply sloped, shaded, and sandy. At least five gullies were evident from the asphalt path down to the water's edge, most likely from water running off the path and foot traffic. Erosion was also evident near two stormwater pipe inlet structures. This was mainly

due to soil disturbance that occurred during pipe installation and foot traffic. Between 2002 and 2004, limited invasive tree and shrub removal was conducted in these remnant areas by Watershed and City staff.

2006 - Restoration begins

The main goals of this restoration were to: (1) repair the highly eroded hill slope gullies and erosion spots along the storm water inlet pipes, and (2) control invasive woody species in the high quality remnant plant communities. In order to fill the gullies, the Watershed contracted with a company that spreads soil via a large blower truck. Because of the 1:1 slopes in many areas, this was the only way that soil could be adequately moved and placed into the gullies. In order to keep the soil from moving down slope once placed in the gullies, a series of “check logs” were staked in the gullies. These logs were soil filled mesh tubes, approximately 12" in diameter. After all of the gullies were filled, a savanna seed mix and cover crop was applied to the bare soil, and then covered with a biodegradable erosion control blanket. Temporary fencing was placed in front of the gullies, adjacent to the pathway, to keep foot traffic to a minimum. In winter, invasive woody species were cut, treated, and removed from the remnant hill slope areas. This work was conducted with Watershed staff and Ramsey County Corrections work crews. In an open oak savanna area adjacent to Larpenteur Avenue, smooth brome was controlled and short grass prairie plugs were installed with the assistance of local school students.



Current Conditions

The repaired gullies are stable. Excessive erosion or soil slumping are not apparent. However, on at least three gully areas, foot traffic has negatively impacted plant establishment. These areas were reseeded in December 2007. The removal of buckthorn and other invasive woody species helped to open the canopy in the oak savanna remnant hill slopes. Sprengel's sedge and other woodland species have seemed to increase in abundance. Prairie forb species planted adjacent to Larpenteur Avenue are becoming established and beginning to flower. Fire is currently being used as a management tool.



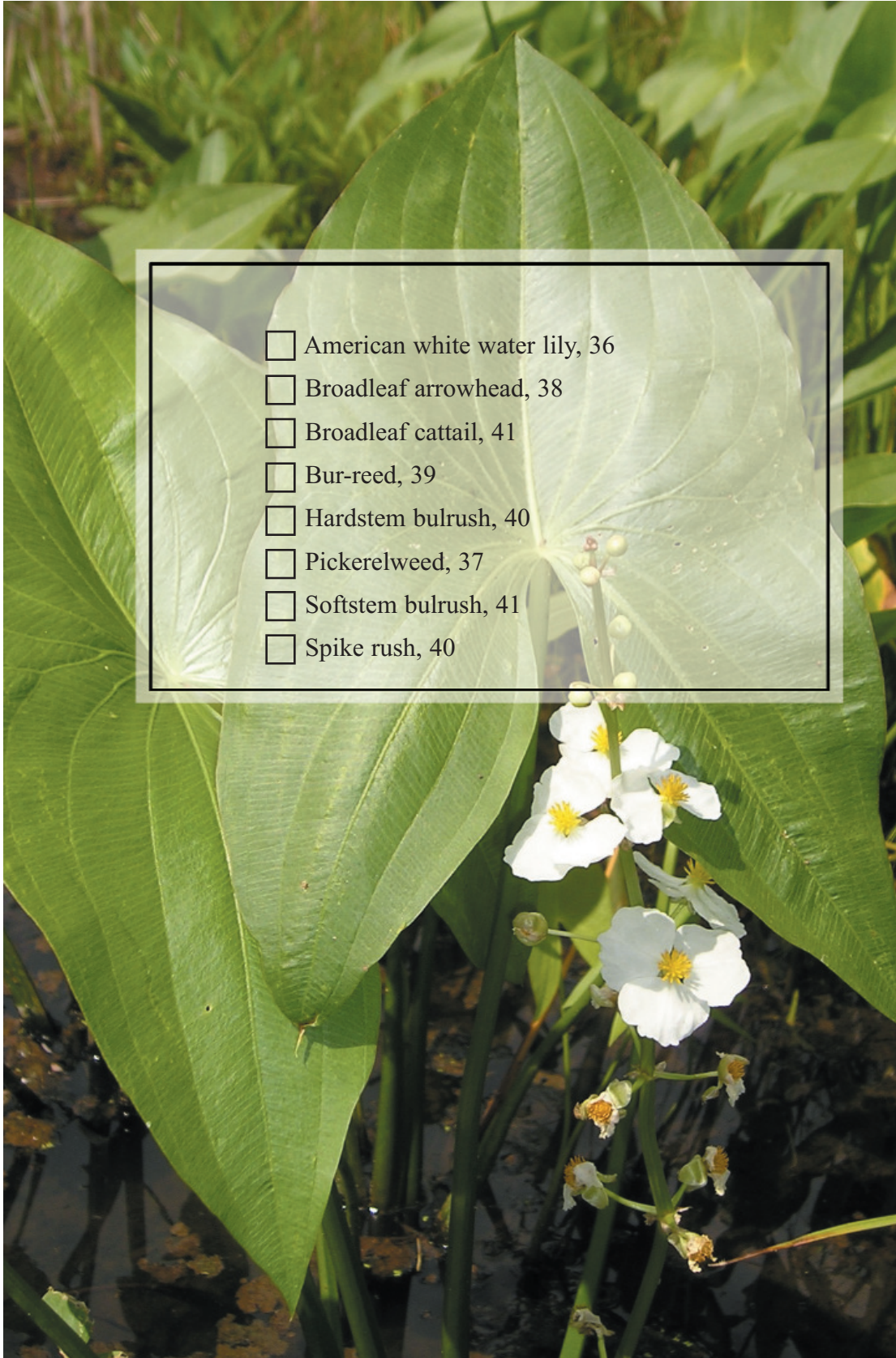
Site Challenges

Management Techniques

Lack of herbaceous ground cover	Control woody invasive species, reseed, introduce fire
Foot traffic causing erosion	Education, maintain temporary fencing
Buckthorn recolonization	Spot treat, prescribed fire

Plant Guide





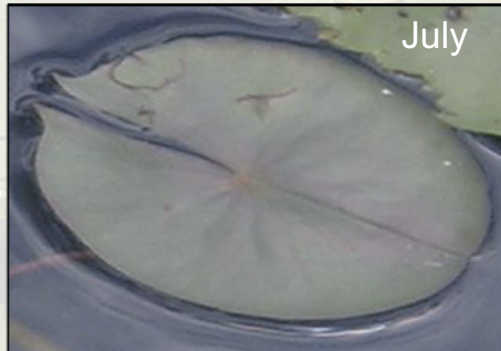
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American white waterlily

Nymphaea odorata



White water lily grows in quiet water throughout our region. It helps create a variety of important aquatic microhabitats, and is the cornerstone of many floating-leaved aquatic communities. Its leaves and flowers are very showy.



Family: Nymphaeaceae
(Water Lily Family)

Height: 0 to 0.5 ft.

Flower: Large, floating, white flowers (3-6" wide) with many pointed petals and a yellow center

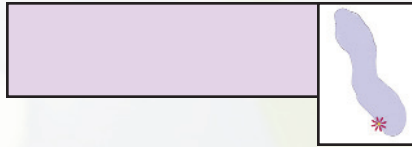
Bloom: July-August

Leaf: Round with a deep notch, dark green and floating



Notes: Water lily is rooted to the lake bottom. Roots produce large tubers.





Pickerelweed *Pontederia cordata*

Pickerelweed is an aquatic plant that forms colonies in quiet shallow water at the margins of lakes, streams and rivers, and sometimes in tamarack swamps. It spreads slowly by rhizomes, but does not become aggressive. It is a very showy plant and important to wildlife.

Family: Pontederiaceae
(Pickerelweed Family)
Height: 2 to 4 ft.
Flower: Violet-blue flowers form a dense spike (4-6" long)
Bloom: July-August
Leaf: Dark green, large heart shaped leaves (up to 7" long)



Notes: Seeds of pickerelweed provide food for waterfowl. Plants also provide cover for fish and frogs.



Broadleaf arrowhead

Sagittaria latifolia



July



June



July

Arrowheads are excellent for shallow water, especially on marshy lakeshores and margins of slow moving streams. They do well in sandy, silty or peaty soils. Common arrowhead has broad leaves and showy flowers.

Family: Alismataceae (Water-plantain Family)

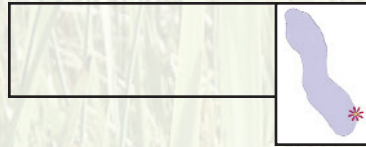
Height: 2 to 3.5 ft.

Flower: 3 white petals (0.5-1" wide) with a yellow center occur in whorls of 3 around a stalk

Bloom: July-August

Leaf: Large, basal arrowhead-shaped leaves (5-16" long) are held above the water on a stalk

Notes: Arrowhead has edible tubers that are valuable to wildlife, hence the alternative names, duck potato and wapato.



Bur-reed *Sparganium eurycarpum*

Giant bur-reed occurs in both prairie and forested regions. It grows in shallow water or mud in full sun. It is a large, sturdy plant and spreads by rhizomes. This plant's robust root system makes it a desirable species for shoreline stabilization.

Family: Sparganiaceae
(Bur-reed Family)

Height: 2 to 5 ft.

Flower: Lower clusters are spheres of white spiky flowers (female), upper flowers are smaller and yellowish (male)

Bloom: June-July

Leaf: Long and sword-like with a flattened triangular cross section (0.25-0.5" wide)

Notes: Seeds are a food source for waterfowl. The plant provides cover for ducks and marsh birds.



Common spikerush

Eleocharis palustris



Creeping spikerush grows along lakeshores and in marshes, wet meadows, and ditches. It does well in shallow water or in wet sand where it spreads by rhizomes. It is easy to establish and useful for erosion control.

Family: Cyperaceae (Sedge Family)
Height: 1.5 to 3 ft.
Seedhead: Small, brown, oval spike (up to 1.5") at top of stem
Leaf: None
Stem: Smooth, round, and unbranched

Notes: Food source for waterfowl and small mammals.

Hardstem bulrush

Schoenoplectus acutus



Hardstem bulrush grows in marshes, lakes, and streams in standing water up to about five feet deep. It does best in a sandy lake bottom. It spreads by rhizomes and can form large patches, but is never as dense as cattails. The sturdy stems provide a good buffer against wave action.



Family: Cyperaceae (Sedge Family)
Height: 3 to 9 ft.
Seedhead: Reddish-brown, oval clusters on several long drooping stalks emerging from a single point near top of stem
Leaf: None
Stem: Round, dark green, not easily crushed as compared to softstem bulrush

Notes: Hardstem bulrush provides important habitat for waterfowl and other wildlife species.



Softstem bulrush *Schoenoplectus tabernaemontani*

Softstem bulrush grows in marshes and in shallow water along lakeshores and streams. It does well in fairly stagnant or calm water and in mud, muck, or wet sand. It spreads by rhizomes and establishes readily by seed on exposed

Family: Cyperaceae (Sedge Family)

Height: 3 to 9 ft.

Seedhead: Brown, oval clusters on several stalks emerging from a single point near the top of the stem

Leaf: None

Stem: Round, light green, easily crushed with fingers when compared to hardstem bulrush

Notes: Softstem bulrush provides important habitat for waterfowl and other wildlife species.



Broadleaf cattail *Typha latifolia*

Broadleaf cattail grows in marshes, lakes and streams. It will tolerate saturated soils and up to 18" of inundation. It spreads by rhizomes. Broadleaf cattail can form floating mats. It will not grow in shady conditions. Also see page 172 (invasive hybrid cattail).

Family: Typhaceae (Cattail Family)

Height: 3 to 9 ft.

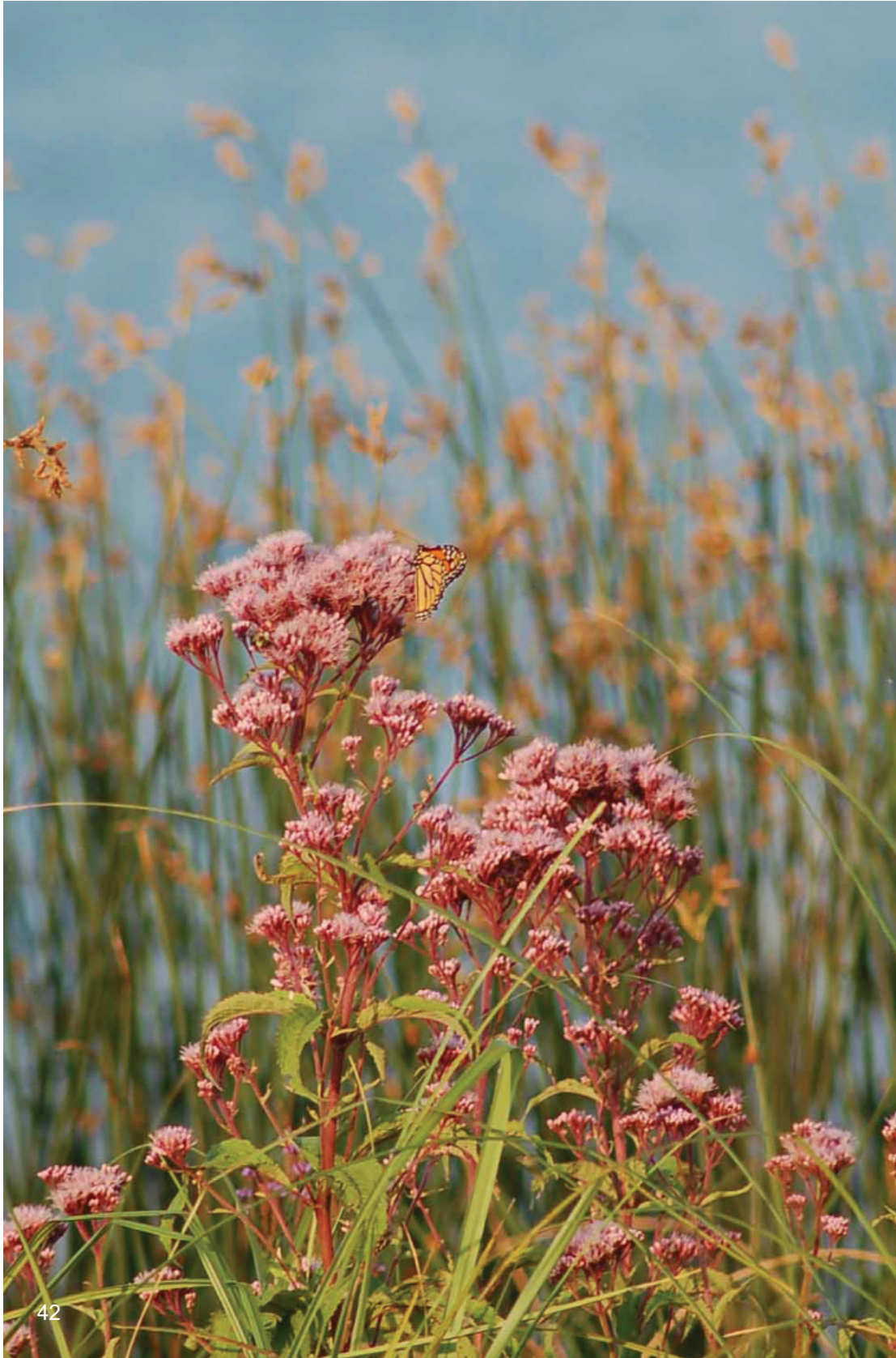
Seedhead: Brown, dense spikes with no gap between male (top) and female (bottom) flowers

Leaf: Bluish-green and flat, up to 1" wide

Stem: Smooth and round

Notes: Provides wildlife habitat. Can spread quickly in open areas.





Wet Meadow Shoreline Plants

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Sweet Flag

Acorus americanus



This wetland species prefers rich, organic soils. It can quickly form a patch which is useful for shoreline stabilization. The erect slender leaves and flowering spike have a spicy fragrance.

Family: Acoraceae (Sweet Flag Family)

Height: 2 to 6 ft.

Flower: Small, forming a dense cluster near the top of the stem, yellow-green in color

Bloom: May-June

Leaf: Sword-shaped, yellowish-green, with a ridge down the center of the back of the leaf.



Notes: The vegetation is similar to Iris. Sweet flag provides food and cover for waterfowl and shorebirds.



Northern water plantain

Alisma triviale



Water plantain is a perennial herb that prefers calcareous, silty or muddy soil rather than acidic or sandy soils. It germinates on mudflats and tolerates seasonal flooding.

Family: Alismataceae
(Water plantain Family)

Height: 3 to 4 ft.

Flower: Small with 3 petals in a highly branched inflorescence

Bloom: June-September

Leaf: Broad with a round or tapered base



Notes: Water plantain provides shade for fish and cover for frogs. The seeds and roots provide food for waterfowl and songbirds.

Canada anemone
Anemone canadensis



Canada anemone is a common plant of moist to wet sunny places, such as wet meadows, margins of marshes, lakes, and streams in a variety of soil types. It spreads aggressively by rhizomes, and without competition from other plants it can eventually take over large areas.



Family: Ranunculaceae
(Buttercup Family)

Height: 1 to 2 ft.

Flower: 5 white petal-like sepals with yellow centers on long stalks

Bloom: May-July

Leaf: Upper leaves are deeply lobed and stalkless whorled around the flowering stem, basal leaves are on long stalks with 5 to 7 lobes

Notes: Can become a ground cover in moist soil.



Swamp milkweed is a widespread plant of wet meadows and other sunny, wet or moist habitats. It can grow on acid peat or non-acid peat, black organic soil, as well as wet to mesic mineral soils. A fragrant, showy plant that is a staple of northern lakeshores.

Family: Asclepiadaceae
(Milkweed Family)

Height: 3 to 4 ft.

Flower: Large pink clusters at the top of the stem

Bloom: June-August

Leaf: Opposite and narrow, up to 4" long



Notes: Attractive to bees and butterflies, monarchs in particular. Stems and leaves bleed a milky sap when broken.



The striking yellow flowers of marsh marigold provide a burst of color in the early spring. It grows in wet or saturated conditions up to 3" of inundation and prefers peaty soils.

Family: Ranunculaceae (Buttercup Family)

Height: 0.5 to 2 ft.

Flower: 5 to 9 bright yellow petals (1-1.5") surround a darker yellow center

Bloom: April-June

Leaf: Wide (2-7") and heart-shaped with shallow teeth



Notes: Provides food for game birds and moose. Poisonous to deer and livestock.



Turtlehead is a tall, wetland herb that grows in wet meadows, sedge fens, at the margins of lakes and streams, and in openings of swamps. It does well on moist sand or black, organic soil. It is very attractive along lakeshores.

Family: Scrophulariaceae
(Figwort Family)

Height: 1 to 3 ft.

Flower: Spiked cluster of white flowers with fused petals resembling a turtle's head

Bloom: July-September

Leaf: Dark green, opposite, narrow, and lance-shaped with sharp teeth

Notes: Attracts butterflies and hummingbirds. Turtlehead is the host plant for the Baltimore butterfly.





Flat-topped aster is a perennial plant found in wet meadows, prairies and along the edges of woods. It is one of the first asters to bloom in the summer.

Family: Asteraceae (Aster Family)

Height: 3 to 4 ft.

Flower: A flat cluster (up to 1' wide) of white flowers with 10-15 petals and yellow center

Bloom: August-September

Leaf: Alternate, smooth and lance-shaped (3-6" long)



Notes: This aster is a host plant for the Pearl Crescent and Silvery Checkerspot caterpillars.



Willow herb is a perennial forb found in wet or moist environments. It prefers full sun or light shade and can tolerate occasional flooding. Each plant produces numerous tiny flowers and distinctive, thin, elongated seed capsules.

Family: Onagraceae
(Evening-primrose Family)

Height: 2 to 3 ft.

Flower: Small (1/3" wide), white or pinkish with 4 notched petals, becoming an elongated, green seed capsule when mature

Bloom: July-September

Leaf: Opposite, becoming alternate higher on the stem (2-6" long), smooth with sharp teeth



Notes: Willow herb is attractive to bees.





Spotted joeypyeweed is a common plant of wet meadows, marshes, ditches, and moist pastures. It grows on moist mineral or peaty soils, but not in clayey soil, or in strongly acidic soil. It quickly fills in sunny places in lakeshore plantings.

Family: Asteraceae (Aster Family)

Height: 3 to 6 ft.

Flower: Large clusters (5-10") of many pink flowers (appear fuzzy)

Bloom: July-September

Leaf: 3-5 lance-shaped toothed leaves (3-9" long) whorled around the often spotted stem



Notes: Very attractive to butterflies. Provides cover for amphibians, reptiles and small mammals.



Boneset is a common plant of wet meadows, marshes, ditches, and moist pastures. It grows on moist mineral or peaty soils, but not on clayey soils, or strongly acidic soils.

Family: Asteraceae (Aster Family)

Height: 2 to 4 ft.

Flower: Flat-topped cluster (2 - 3") of many white tiny flowers (appears fuzzy)

Bloom: July-October

Leaf: Wrinkly, opposite and joined at the base, stem appears to grow through the leaves

Notes: A late nectar provider for butterflies. Provides cover for amphibians, reptiles, and small mammals.





Bottle gentian grows in moist to wet soil (not in standing water) in prairies, wet meadows, marshes, shrub swamps, and along lakeshores or streambanks. It is a beautiful, late-season flower. Never transplant wild plants. Seedlings and adult plants have a mycorrhizal (fungus-root) association which requires special care.

Family: Gentianaceae (Gentian Family)

Height: 1 to 2 ft.

Flower: 5 blue petals are fused creating a bottle-shaped flower (1-1.5"), flowers form clusters at top of stem

Bloom: August-October

Leaf: Waxy, opposite and lance-shaped, no teeth, 3 veins, leaf edges often curl upward forming a trough

Notes: Attractive nectar source for bumblebees; they force petals apart to get inside.



Jewelweed is an early colonizing species, often growing in disturbed areas. It will grow in full shade as well as full sun. The delicate vegetation is easily crushed.

Family: Balsaminaceae
(Touch-me-not Family)

Height: 3 to 5 ft.

Flower: Orange with an open mouth and curved spur, reddish spots (0.75-1" long)

Bloom: June-September

Leaf: Alternate, oval with larger teeth (1-4" long) on short stalks

Notes: When the seedpods are ripe, they explode when touched. Jewelweed is a nectar source for hummingbirds and provides cover for frogs.





Blue flag iris is a superb native plant of marshes, wet meadows, and lakeshores. It grows on wet sand, wet silty-sand, sedge peat, or muck. It forms dense clumps from thick rhizomes - good for stabilizing soil.

Family: Iridaceae (Iris Family)

Height: 1.5 to 3.5 ft.

Flower: Large blue or violet with 3 downcurved petal-like sepals with a white and yellow throat

Bloom: June-July

Leaf: Upright, grasslike, 1" wide, up to 32" long and smooth on both sides

Notes: Attracts hummingbirds and butterflies. Provides food and cover for several wildlife species.



Prairie blazing star occurs in wet or moist prairies and meadows, and does well in rich loam soil. It needs direct sun, but it can compete well with other prairie wildflowers and grasses. It has a densely packed flowering stalk and is very showy.

Family: Asteraceae (Aster Family)

Height: 2 to 5 ft.

Flower: Tiny purple flowers are densely crowded into a tall spike (6"-1.5' long)

Bloom: July-August

Leaf: Grasslike, alternate, decreasing in length towards top of stem, white midvein

Notes: Attractive to butterflies and deer. Prairie blazing star is the tallest of Minnesota's blazing star species.





Cardinal flower is often planted for its brilliant red flowers. It is a short-lived perennial so it must re-seed to persist. Prepare well-drained, rich, loam or sandy loam soil next to parent plants for seedlings. It does well in full sunlight or shade.

Family: Campanulaceae
(Bellflower Family)

Height: 2 to 4 ft.

Flower: Bright red, alternate on stem forming a spike, irregular shaped (3 lower and 2 upper petals) forming a tube

Bloom: July-September

Leaf: Alternate, dark green (up to 6" long) with irregular teeth

Notes: Nectar source for hummingbirds.



Great blue lobelia is a common plant of lakeshores, streambanks, wet meadows, wetland margins, moist woods margins, and ditches - places that are moist and sunny. It is a perennial that does not like to be crowded.

Family: Campanulaceae
(Bellflower Family)
Height: 1 to 3 ft.
Flower: Blue irregular flowers
are alternate along
stem forming a spike
(up to 1' long)
Bloom: August-September
Leaf: Alternate with irregu-
lar teeth (up to 6"
long)



Notes: Attractive to hummingbirds,
songbirds and deer.



American water horehound is a common plant found in wet meadows, marshes and along lakeshores. It prefers moist soil conditions and full sun or partial shade. It is not aromatic despite being a member of the mint family.



Family: Lamiaceae (Mint Family)
Height: 1 to 3 ft.
Flower: White tubular flowers found in clusters along the square stem at the base of the leaves
Bloom: July-September
Leaf: Opposite with deep, coarse teeth

Notes: American water horehound is used by insects, voles, mice and grouse.



Mark Gernes, MN Pollution Control Agency

Monkey flower is a showy herb that grows along lakeshores, streambanks, and at the edges of wet meadows and marshes. It will grow in silt or loam but does best on wet sand where it can readily reproduce from seed.

Family: Scrophulariaceae
(Figwort Family)

Height: 1 to 3 ft.

Flower: Blue-purple irregular flowers with yellow in the center, on long stalks, form in upper leaf axils

Bloom: July-August

Leaf: Opposite with teeth and no stalks

Notes: Stems of monkey flower are square.



Sensitive fern is common on moist to wet soil in wet meadows, at the margins of marshes and peatlands, by lakes and streams, and in forest or woodland swales. It does well on many soil types, especially slightly acidic, sandy loam. It spreads readily by rhizomes and is sensitive to frost.



Family: Onocleaceae
(Sensitive fern Family)
Height: 1 to 2 ft.
Fertile frond: July-December
Leaf: Light green, consisting of 8-12 paired segments, each with many rounded teeth

Notes: Provides cover for small mammals and songbirds.





Obedient plant is an attractive clump forming plant with snapdragon-like flowers. It prefers the moist to saturated soils of wet meadows, lakeshores and streambanks. This species can be aggressive.

Family: Lamiaceae (Mint Family)
 Height: 2 to 4 ft.
 Flower: Pink to lavender tubular flowers (snapdragon-like) in a 4-6" spike-like cluster
 Bloom: July-September
 Leaf: Long (up to 6") and opposite with sharp teeth along a square stem



Notes: Flowers can be pushed right or left on flowering stalk and they will "obediently" stay there. Butterflies and hummingbirds use obedient plant as a nectar source.



Virginia mountain mint occurs primarily in wet meadows, wet prairies, wetland margins, woodlands and savannas, and along lakeshores and streambanks on wet to well-drained, sandy loam soil. It spreads by rhizomes and is a good soil stabilizer.

Family: Lamiaceae (Mint Family)

Height: 1 to 3 ft.

Flower: Small white flowers form several small clusters at the end of the stems

Bloom: July-August

Leaf: Opposite, narrow and toothless (up to 2.5" long)



Notes: Stems are square and hairy along edges. Vegetation is very aromatic. Attractive to butterflies.



Cup plant is a large perennial plant with bright yellow sunflower-like flowers. It grows well in upland moist to wet soil conditions and areas with full sun exposure.

Family: Asteraceae
(Aster Family)

Height: 4 to 8 ft.

Flower: Each plant has several yellow flowers with 20-30 petals and darker yellow centers

Bloom: July-August

Leaf: Large, opposite leaves (6-10" long) united at the base to form a cup along a square stem

Notes: The cup-like leaves hold rainwater that is used by birds and tree frogs. The seeds are eaten by birds and mice.





New England aster is the most widely cultivated aster. It grows in native habitats such as wet or mesic prairies and wet meadows. It spreads by vigorous rhizomes as well as by seed. This species may initially be confused with red-stemmed aster.

Family: Asteraceae (Aster Family)

Height: 3 to 5 ft.

Flower: Numerous small violet petals surrounding a yellow center, 1 to 2" wide at top of stem

Bloom: August - October

Leaf: Lance shaped clasping the stem



Notes: Provides cover for waterfowl and is a nectar source for butterflies.



Red-stemmed aster is a hardy perennial plant found in swamps, sedge meadows and along shorelines. It can be aggressive and invade open areas.

Family: Asteraceae (Aster Family)

Height: 1.5 to 5 ft.

Flower: Several blue or violet flowers (1-1.5" wide) with yellow centers on a red or purple hairy stem

Bloom: August-October

Leaf: Lobed at the base, clasping the stem, with teeth



Notes: Attractive to butterflies and bees and provides cover for waterfowl.



Germander is a rhizomatous perennial found in moist to wet prairies and along shorelines. The vegetation has a slightly fowl odor when crushed.

Family: Lamiaceae (Mint Family)

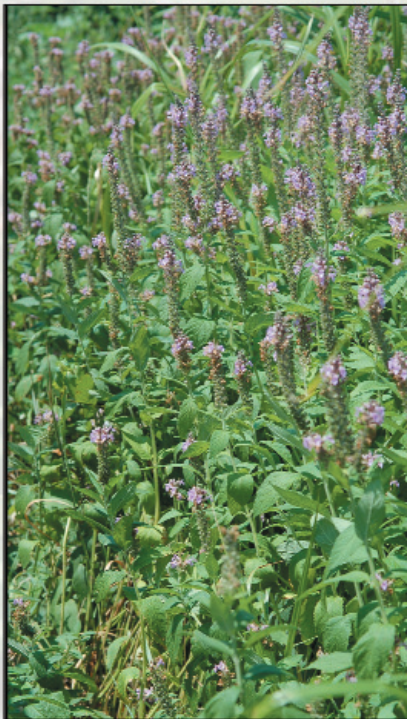
Height: 1 to 3 ft.

Flower: Unique, 5-parted lavender flowers in a dense, spike-like cluster at the top of a hairy stem

Bloom: July-August

Leaf: Opposite, toothed and hairy on the top on a downy, square stem

Notes: Germander is a nectar source for butterflies.





Blue vervain grows in wet meadows, wet prairies, mesic prairies, and along streams and lakeshores. It does well on wet sand, black organic soil, or upland loam soil. Spreads mostly by seed. Blue vervain is one of the most common forb species found along urban shorelands.



Family: Verbenaceae
(Vervain Family)
Height: 2 to 5 ft.
Flower: Many blue-purple flowers create several thin spikes (2-5" long) at top of the plant, flowers bloom from the bottom up
Bloom: July-Sept
Leaf: Opposite, narrow and toothed (4-6" long), lower leaves sometimes have 3 lobes

Notes: Several species of bird eat the seeds and small mammals eat the shoots. Butterflies and bees are attracted to its high nectar content. Stems are square.





Ironweed grows along streambanks and lakeshores, in wet meadows and marshy areas. It can grow on relatively heavy, silty or clayey soil and can tolerate some seasonal flooding. Because of its height and flower, ironweed can become a conspicuous component in ecological restorations.

Family: Asteraceae (Aster Family)

Height: 3 to 6 ft.

Flower: Flat-topped cluster (up to 5" wide) of deep purple flowers

Bloom: July-September

Leaf: Long (up to 6") and sharply toothed with tiny pits on underside

Notes: Nectar source for butterflies and bees. Stems are usually reddish purple.

Culver's root grows in wet meadows, mesic prairies, and along woodland edges. It grows best on moist, sandy loam, or well-drained loam. It can produce several stems per cluster. It spreads by seed and is attractive in mixtures or for show.

Family: Scrophulariaceae
(Figwort Family)

Height: 3 to 5 ft.

Flower: Small, white tube-shaped flowers
form a cluster of tapering spikes
(up to 10-12" long)

Bloom: July-August

Leaf: Slender leaves (2-6" long) with
fine teeth are whorled around the
stem in groups of 3-7

Notes: Attractive to butterflies and
especially bees.



Canada bluejoint
Calamagrostis canadensis



Canada bluejoint is a perennial, cool-season grass. It spreads via rhizomes, forming clumps. It prefers moist to wet soils and is often a grass associate of sedge and wet meadows.

Family: Poaceae (Grass Family)
Height: 3 to 6 ft.
Seedhead: Narrow, 3.5 to 9" long, purplish when in bloom
Leaf: Narrow and rough up to 1/4" wide with a white, papery structure at the base
Stem: 3 to 8 prominent joints along the stem are blue to reddish purple

Notes: The seeds are eaten by songbirds and waterfowl. The plant itself is often grazed by small mammals, geese and moose.

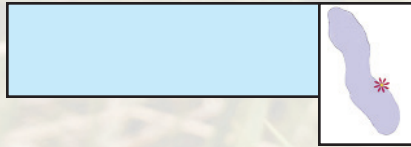
Bottlebrush sedge
Carex comosa



Bottlebrush sedge grows in marshes, wet meadows, sedge fens, open swamps, and along lakeshores on wet sand, mud, muck or sedge peat. It forms large clumps with long, broad leaves.

Family: Cyperaceae (Sedge Family)
Height: 2 to 4 ft.
Seedhead: Female spikes are nodding and have a bottlebrush appearance, male spikes are slender and above female spikes
Leaf: M-shaped cross-section, up to 0.5" wide with rough edges
Stem: Sharply triangular

Notes: Provides food and cover for many forms of wildlife.



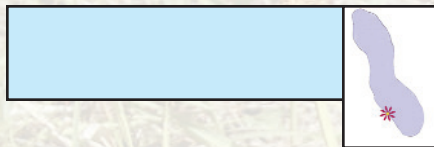
Lake sedge

Carex lacustris

Lake sedge is a tall, coarse sedge that dominates many native wet meadows and marshes, or is intermixed with other sedges and grasses. It grows on muck, sedge peat, wet sand, or silt. It spreads readily by rhizomes.

Family: Cyperaceae (Sedge Family)
Height: 2 to 4 ft.
Seedhead: 2-4 female spikes up to 4" long, bristly in appearance.
2-4 male spikes, thin above female spikes
Leaf: M-shaped cross-section (0.3-0.55" wide), longer than stems
Stem: Triangular, can be purple or reddish near base with ladder-like fibers

Notes: Provides food and cover for many forms of wildlife.



Awl-fruited sedge

Carex stipata

Awl-fruited sedge grows well in wet to moist soils of peat and loam. It prefers shade but will grow in full sun in wet meadows. It grows fast in shoreland habitats and restorations and provides soil stabilization.

Family: Cyperaceae (Sedge Family)
Height: 2 to 3 ft.
Seedhead: Dense spike, prickly in appearance, greenish-brown in color at top of stem
Leaf: Shorter than stem, coarse, m-shaped cross-section
Stem: Sharply triangular, spongy

Notes: Provides food and cover for many forms of wildlife. Awl-fruited sedge is similar to fox sedge but more robust.



Tussock sedge

Carex stricta



Jason Husveth

Tussock sedge forms hummocks in sedge meadows, marshes, stream banks, shorelines and in ditches. The hummocks can be up to 3 feet wide and persist for many years.

Family: Cyperaceae (Sedge Family)

Height: 2 to 3 ft.

Seedhead: Thin, dense spike of green to brown seed capules drooping slightly at the top of the stem

Leaf: Slender and green with rough edges

Stem: Rough and triangular, exceeding the height of the leaves

Notes: Provides food and cover for many forms of wildlife.



Fox sedge grows in a variety of sunny, shallow, wet places. It forms clumps and tolerates flooding once established. It grows easily and rapidly from seed.

Family: Cyperaceae (Sedge Family)

Height: 1 to 3 ft.

Seedhead: Brown spike resembling a fox's tail containing long bristles

Leaf: Narrow and longer than the stem, smooth up to 1/6" wide

Stem: Slender, triangular and rough to the touch

Notes: Seeds are a food source for waterfowl. Provides food and cover for many forms of wildlife.

		Scouringrush horsetail <i>Equisetum hyemale</i>
--	---	---

Scouringrush horsetail is a perennial, reed-like plant commonly found in open or wooded areas along streams and ponds. It will often produce dense colonies. It does not form a flower but reproduces by releasing spores.

Family: Equisetaceae (Horsetail Family)
 Height: 1 to 3 ft.
 Seedhead: none
 Leaf: none
 Stem: Cylindrical and hollow, 1/3" in diameter, unbranched with rough ridges

Notes: Scouringrush horsetail has rough ridges along the stem and was once used to scrub (scour) dishes and pans.



		Fowl manna grass <i>Glyceria striata</i>
--	---	--

Fowl manna grass is a perennial, cool-season grass found in swamps, wet meadows, and shorelines. It prefers moist or saturated soil and can tolerate regular inundation.

Family: Poaceae (Grass Family)
 Height: 1 to 3 ft.
 Seedhead: Drooping and purplish, spreading and open (4-8" long)
 Leaf: Greenish or purplish, smooth and slender (1/16 - 1/4" wide)
 Stem: Slender 12-40" long

Notes: Provides cover and food for waterfowl and muskrats.



Path rush
Juncus tenuis



July



Path rush is a common plant on moist, compacted soil such as on trails near wetlands or through woodlands. It does well on a variety of soil types and can tolerate summer drought. It is slender and forms small tufts. It reproduces readily by seed.

Family: Juncaceae (Rush Family)

Height: 0.5 to 2 ft.

Seedhead: Several small and brown, each with a slender stalk form a cluster that erupts from the same place near the top of the stem

Leaf: Flat or rolling, very thin, basal

Stem: Round, bright green

Notes: Provides cover for waterfowl and other wildlife.

Torrey's rush
Juncus torreyi



August



Torrey's rush grows primarily in the prairie region in wet soil in sunny meadows and at marsh edges. It is a sturdy plant and its tough rhizomes can spread through heavy wet soil. The seed capsules are arranged in attractive ball-shaped clusters.

Family: Juncaceae (Rush Family)

Height: 1 to 3 ft.

Seedhead: Ball-like clusters of brown spikelets on short stalks at top of stem

Leaf: 2-3 narrow, round leaves on stem

Stem: Smooth, round, and hollow

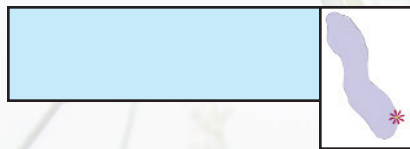
Notes: Provides spawning grounds for fish and food for ducks and small mammals.

Rice cutgrass is a perennial grass found in moist or saturated soils in up to 6" of inundation. It spreads by rhizomes, forming large colonies. The saw-edged leaves can cut skin when walking through patches.

Family: Poaceae
(Grass Family)
Height: 2 to 5 ft.
Seedhead: Open, greenish white and often drooping, 4 to 8" long
Leaf: 8 to 12" long, rough with tiny teeth along the margins
Stem: Upright or sprawling with velvety joints



Notes: Seeds are a food source for ducks, sparrows and rails. The roots are eaten by some ducks and muskrats.



River bulrush *Schoenoplectus fluviatilis*

River bulrush grows in standing water in marshes as well as along lakeshores and river beaches - it may also be considered an emergent species. It spreads by rhizomes and its tough, coarse root masses are good for controlling erosion caused by waves or currents.

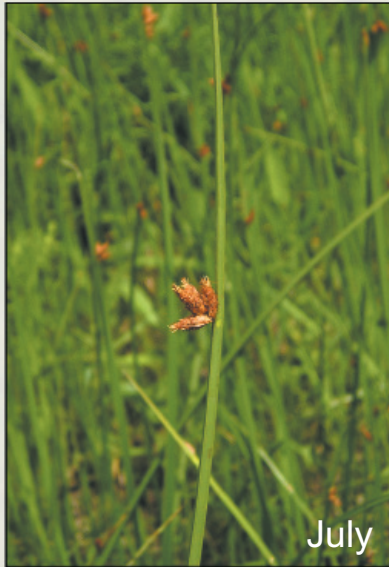
Family: Cyperaceae (Sedge Family)
Height: 4 to 8 ft.
Seedhead: Large brown spikelets (up to 1" long) on 4" arching stalks
Leaf: Smooth up to 0.5" wide, m-shaped
Stem: Sharply triangular

Notes: River bulrush has starchy tubers that are important wildlife food.



Three-square bulrush

Schoenoplectus pungens



Three-square bulrush grows in shallow, standing water and saturated soils near lakeshores, river beaches, and in marshes and ditches. It spreads by rhizomes and can tolerate water level fluctuations. It has fairly slender, triangular stems yet it can withstand moderate wave action.

Family: Cyperaceae (Sedge Family)

Height: 2 to 4 ft.

Seedhead: Several oval spikelets (0.25-0.75" long) emerging from a singular point near the top of the stem

Leaf: None

Stem: Sharply triangular with concave sides

Notes: Provides habitat and food for waterfowl and other wildlife species.

Green bulrush

Scirpus atrovirens



Green bulrush grows in wet meadows, marshes, and in openings in swamps on wet sand or silt, or muck. Once established, the clumps tolerate water level fluctuations, both flooding and draw-down.

Family: Cyperaceae (Sedge Family)

Height: 2 to 5 ft.

Seedhead: 2 or more leaf-like bracts subtend round, brown clusters on short stalks

Leaf: Bright green, m-shaped up to 3/4" wide

Stem: Triangular with rounded edges

Notes: Provides habitat and food for waterfowl and other wildlife species.

Family: Cyperaceae
(Sedge Family)

Height: 3 to 5 ft.

Seedhead: Several light brown spikelets on long curving stalks at top of stem, wooly when mature

Leaf: Several slender basal leaves and ~10 stem leaves, up to 0.75" wide

Stem: Smooth and rounded

Notes: Provides habitat and food for waterfowl. Mature seedhead has a wooly look.



Prairie cordgrass

Spartina pectinata



Prairie cordgrass grows in moist to wet soil such as sand, silt, clay or loam. It needs direct sunlight, and does well in wet prairies and marshy lakeshores. It can spread rapidly, and is very useful in erosion control. The leaf margins have very fine teeth and can cut skin.

Family: Poaceae (Grass Family)

Height: 3 to 6 ft.

Seedhead: Long, golden, comb-like spikes in an open inflorescence at the top of the stem

Leaf: Arching, shiny, and flat, up to 3/8" wide with rough edges

Stem: Round and smooth

Notes: Food source for marsh birds and the black duck. Provides habitat for marsh wrens.



August



Prairie and Oak Savanna Plants

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Yarrow

Achillea millefolium



Yarrow is a perennial herb that will grow in most soils. It is usually found on poor, dry soils where other plants do not grow. It is an aggressive plant and could become weedy. The foliage is fragrant when crushed.

Family: Asteraceae
(Aster Family)

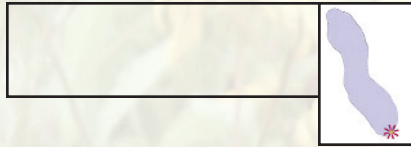
Height: 1 to 3 ft.

Flower: Small white flowers with 5 petals are arranged in a dense flat-topped cluster (2-4" wide)

Bloom: June-October

Leaf: Narrow and finely divided (6"), fern-like, with short white hairs

Notes: The flowers of yarrow attract bees, butterflies, and ladybugs. Yarrow has been used as a medicinal plant. The foliage was used to stop external bleeding.



Anise hyssop
Agastache foeniculum



Anise hyssop grows in prairies and open woodlands on dry, sandy, gravelly, sometimes silty soil. It is commonly planted for its deep green, aromatic foliage and attractive blue flower spikes. It reproduces readily from seed.



Family: Lamiaceae (Mint Family)
Height: 3 to 4 ft.
Flower: Dense spike (1-3" tall) of small blue flowers, sometimes interrupted
Bloom: July-August
Leaf: Sharply pointed, opposite, toothed (2-3" long)

Notes: Attractive to bees and butterflies. Anise hyssop has a square stem and foliage has a strong licorice smell.



White snakeroot

Ageratina altissima



White snakeroot is a late-blooming wildflower that is often found growing along the edges of deciduous woods. It prefers shady areas or areas with only partial sun and moist to slightly dry soils. It is common in urban and somewhat disturbed wooded areas.

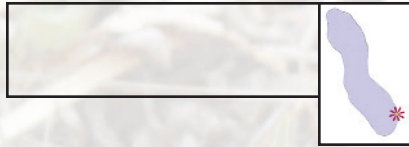


Family: Asteraceae
(Aster Family)
Height: 1 to 3 ft.
Flower: Several flat clusters of small white flowers (1/6") at the top of the stem
Bloom: August-October
Leaf: Opposite and wide, up to 6" long with ragged teeth



Notes: White snakeroot is avoided by mammals because the foliage is bitter and toxic. The nectar attracts bees, butterflies, and moths.





Prairie onion

Allium stellatum

Prairie wild onion is a prairie plant that grows in dry, sandy or gravelly soil. It occurs outside of the prairie region in rocky areas and along some lakeshores. It forms a small bulb.

Family: Liliaceae (Lily Family)

Height: 1 to 2 ft.

Flower: Small pink flowers in a round cluster (1-2" wide) at the top of the stem

Bloom: July-August

Leaf: Narrow and grasslike

Notes: Attracts butterflies and bees and is edible. Has a strong onion fragrance.



Lead plant
Amorpha canescens

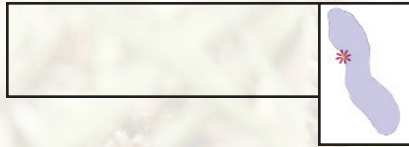


Lead plant is a characteristic prairie shrub in our region. It grows best where it can develop deep roots such as on well drained sand or sandy loam. Its gray-green foliage is unique. If cut back to the ground in the autumn, it will resprout vigorously the following spring and flower profusely in the summer.

- Family: Fabaceae
(Pea or Bean Family)
Height: 2 to 4 ft.
Flower: A spike with small blue-purple flowers with orange protruding centers
Bloom: June-July
Leaf: 1-3" long, divided with many leaflets and woolly in appearance

Notes: As a member of the bean family, lead plant roots host nitrogen-fixing bacteria which provide the plants with nitrogen in exchange for sugars.





False indigo

Amorpha fruticosa

False indigo is a shrub that grows right at the edge of lakes and streams on sandy or silty banks. It tolerates some flooding, and ice damage. The delicate lacy foliage is very attractive, and the long clusters of blue-purple flowers are conspicuous in the summer.

Family: Fabaceae
(Pea or Bean Family)

Height: 6 to 12 ft.

Flower: Deep blue-purple flowers with yellow protruding stamens form several spikes (3-6" long) throughout the shrub

Bloom: May-June

Leaf: Alternate leaves are divided into 11-27 oval leaflets

Notes: False indigo is a source of food and cover for waterfowl, shorebirds, and small mammals.



Thimbleweed
Anemone virginiana



July



July



July

Thimbleweed is a common plant in prairies and dry, open woodlands. It is a short-lived plant that grows on well drained, light textured soil. It reproduces by seed and does best in prairies with openings, where seedlings have access to sun.

Family: Ranunculaceae
(Buttercup Family)

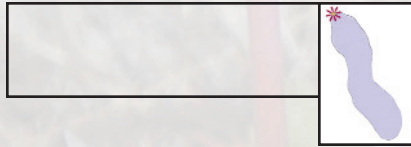
Height: 1 to 2 ft.

Flower: 5 white petal-like sepals
with a thimble-shaped
center up to 1" long

Bloom: June-July

Leaf: Basal leaves are whorled
and divided into 3-5
toothed lobes, stem leaves
are similar but smaller

Notes: Seed heads turn cottony
when ripe.



Columbine

Aquilegia canadensis

Columbine is native to eastern North America and grows in a variety of forest and woodland habitats. It grows in openings in mesic forests, in dry, oak woodlands, and on rocky or gravelly slopes and bluffs. It is short-lived but re-seeds readily if there is ample light and space in the ground layer.

Family: Ranunculaceae
(Buttercup Family)

Height: 2 to 3 ft.

Flower: 5 red, united tubes with yellow centers (1-2" long)

Bloom: May-July

Leaf: Divided with several leaflets having 3 lobes, on long stalks

Notes: The nectar filled tubes are attractive to hummingbirds.



Common milkweed

Asclepias syriaca



Common milkweed is a native, perennial plant. It tolerates wet and dry, as well as sunny or shady conditions. It is spread by both rhizomes and seed and is considered a weed in agricultural systems.

Family: Asclepiadaceae
(Milkweed Family)

Height: 2 to 5 ft.

Flower: Pink flowers consisting of 5 downward and 5 upward pointed petals in a large round cluster from the leaf axil.

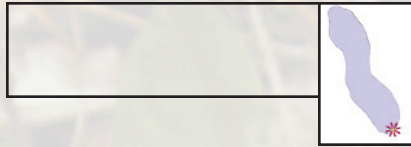
Bloom: June-August

Leaf: Large, light green and oval with smooth edges (4-6" long)



Notes: Monarchs lay their eggs on milkweed plants. The stem and leaves exude a milky sap when broken.





Butterfly milkweed

Asclepias tuberosa

Butterfly milkweed is a plant of prairies and is a popular ornamental. It grows on well-drained upland soils, especially on a deep loam or sandy loam where it can develop a taproot. Its orange flower makes it a favorite among prairie restoration enthusiasts.

Family: Asclepiadaceae
(Milkweed Family)

Height: 1.5 to 2 ft.

Flower: Bright orange flat-topped clusters (2-3" wide)

Bloom: June-August

Leaf: Alternate, hairy, and lance-shaped, widening at tip

Notes: Very attractive nectar source for butterflies. Young plants resemble horseweed.



White wild indigo

Baptisia alba



White wild indigo is a showy, prairie plant standing out among the surrounding prairie grasses. It prefers full sun and slightly dry or moist soils. It is a long-lived plant but can take several years to reach blooming size.



Family: Fabaceae (Pea Family)

Height: 2 to 5 ft.

Flower: White pea-like flowers in a spike-like cluster (up to 2" long) at the top of the stem

Bloom: June-July

Leaf: Smooth and bluish-gray with three oval leaflets (2" long)



Notes: The leaves provide food for some caterpillars. In the fall the flowers turn into blackish pea pods that remain throughout the winter.



Cream wild indigo

Baptisia bracteata

Cream wild indigo can be found in prairies and open upland woods in full sun or part shade. It is shorter than white wild indigo with larger cream (versus white) flowers.

Family: Fabaceae (Pea Family)

Height: 2 to 2.5 ft.

Flower: Large creamy white pea-like flowers in a spike-like cluster at the top of the stem

Bloom: May-June

Leaf: Hairy and alternate with three leaflets (up to 3" long)



Notes: In the fall the flowers turn into blackish pea pods that remain throughout the winter.



Virginia Gaynor

Beggartick

Bidens sp.



Beggartick is an annual, native plant typically found in moist to wet areas. The prickly seeds stick to skin, clothing, and animal fur.

Family: Asteraceae (Aster Family)

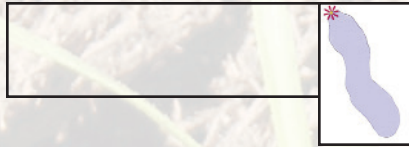
Height: 1 to 5 ft.

Flower: Orange-yellow petals surrounding a brownish center found at the top of the plant and in the leaf axils

Bloom: July-October

Leaf: Opposite, divided with 3-5 leaflets that are lance-shaped and toothed

Notes: Beggartick is a native plant but it can be aggressive. Hand pulling is sometimes done to thin areas where beggartick is competing with other native vegetation.



Harebell

Campanula rotundifolia

Harebell is a small, slender herb that grows in a variety of situations where the soil is too thin, poor, or unstable for other plants - rocky cliffs and remote ledges, crests of bluffs, sandy or gravelly slopes, sand dunes, lakeshores, and streambanks, as well as dry prairies and woodlands. Harebell has a conspicuous flower for such a small plant.

Family: Campanulaceae
(Bellflower Family)

Height: 1 to 1.5 ft.

Flower: Bell shaped, 0.75" long with 5 blue nodding petals fused together

Bloom: June-September

Leaf: Alternate, grass-like, 3" long, basal leaves are round and die back before flowering

Notes: Stems exude a milky sap.
Flowers droop to protect pollen from rain.



Partridge pea

Chamaecrista fasciculata



Partridge pea is an annual plant commonly found in prairies and along roadsides with well-drained soils. Its leaves fold up when touched or exposed to direct sunlight. It can provide early color through blooming during the first year of restoration.

Family: Fabaceae (Pea Family)

Height: 1 to 3 ft.

Flower: Showy and yellow (up to 1" wide) with 5 round petals and dark red centers, in groups of 2 to 4 in the leaf axils

Bloom: July-September

Leaf: Alternate (2-3" long) with 20-30 small, narrow leaflets



Notes: The seed provides food for birds. Long-tongued bees pollinate the flowers.



Lance-leaved tickseed is a prairie plant that prefers dry or moist, sandy soils. It grows best in areas with full sun exposure. It is a common landscape plant.

Family: Asteraceae
(Aster Family)

Height: 2 to 3 ft

Flower: 6-10 golden yellow petals with 3-7 jagged lobes at the tip, surrounding a yellow center

Bloom: June-August

Leaf: Lance-shaped (3-6" long) with two basal lobes



Notes: The much larger leaves of lance-leaved tickseed distinguish it from stiff tickseed.



Stiff tickseed

Coreopsis palmata



Stiff tickseed is a prairie plant. It does best on light, well-drained soils such as sandy loam where it can spread by underground rhizomes. It has a slender, erect stem and interesting, 3-pronged leaves like a bird's foot. This coreopsis can spread vigorously.

Family: Asteraceae (Aster Family)

Height: 1 to 2 ft.

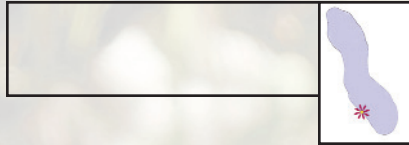
Flower: 6-10 bright yellow petals
tipped with 3-4 teeth
surround a darker yellow
center

Bloom: June-July

Leaf: Opposite, 3-pronged,
resembling a birds foot

Notes: Attractive to butterflies and
bees. Can be used along with other
species to stabilize slopes with poor
soils.





White prairie clover

Dalea candida



White prairie clover grows in dry to mesic prairies on deep, loam or sandy soil. Like many legumes (members of the Pea Family), microbes that occur in root nodules help it utilize atmospheric nitrogen, giving it a nutritional advantage on sterile or poor soils.



Family: Fabaceae
(Pea or Bean Family)
Height: 1 to 2.5 ft.
Flower: Cylindrical flower head
made up of many tiny white
flowers
clustered together
Bloom: June-July
Leaf: Alternate along stem 1.5"
long, leaves divided into 5-9
leaflets

Notes: Attractive to butterflies and bees. Vegetation is similar to purple prairie clover except leaves are larger.



Purple prairie clover

Dalea purpurea



Purple prairie clover grows in dry to mesic prairies on sandy loam or loam soil. It can do well in slightly droughtier situations than white prairie clover. In short grass prairies, the bright purple flower heads are conspicuous during the summer months.



Family: Fabaceae

(Pea or Bean Family)

Height: 1 to 2 ft.

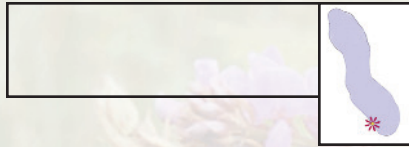
Flower: Cylindrical flower head with tiny purplish pink flowers

Bloom: June-July

Leaf: Alternate along stem (0.5-0.75" long), divided into 5-7 narrow leaflets

Notes: Attractive to butterflies and bees. Vegetation is similar to white prairie clover but leaves are smaller and have a citroney fragrance.





Showy ticktrefoil

Desmodium canadense

Showy ticktrefoil is a perennial plant found in prairies and wet meadows preferring upland moist to dry soils. The seed pods are sticky and cling to animal fur and clothing. It establishes well from seed, and the seedlings can grow vigorously.

Family: Fabaceae (Pea or Bean Family)

Height: 3 to 6 ft.

Flower: Rose or purple pea-like flowers (1/2" long) in crowded, elongated clusters at the top of the stem

Bloom: July-August

Leaf: Clover-like with three oval leaflets (4" long) covered in dense hairs

Notes: Provides food and cover for quail, pheasants, turkey, ground birds and deer.





Pale purple coneflower is a perennial prairie plant. It grows well in dry or somewhat moist soils in full to partial sun. Its thin, drooping petals make this plant a visual interest in prairie mixtures. It is a popular prairie garden plant.

Family: Asteraceae
(Aster Family)

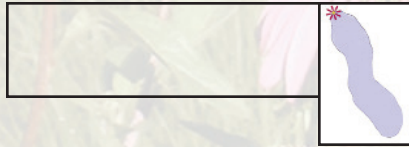
Height: 2 to 4 ft.

Flower: Thin, pink or purplish, drooping petals surround a large, dark purple, spiky, center

Bloom: June-August

Leaf: Long and hairy with no teeth and parallel veins

Notes: The long, toothless leaves and thin petals distinguish pale purple coneflower from purple coneflower. The flowers attract butterflies and hummingbirds.



Purple coneflower

Echinacea purpurea

Purple coneflower is a showy perennial commonly planted in flower gardens. It prefers moderately dry to damp soil and full sun or partial shade. It can grow in all soil types and is able to withstand drought.



Family: Asteraceae
(Aster Family)

Height: 3 to 4 ft.

Flower: 14 to 20 drooping, purple petals surround a large orange, spiky center

Bloom: July-September

Leaf: Rough with coarse teeth and 3 veins (5" wide, 8" long)

Notes: The seeds are a very attractive food source for the American Goldfinch. It is also attractive to butterflies.



Daisy Fleabane

Erigeron strigosus



Daisy fleabane is an annual plant of questionable origin. It invades moist prairies and disturbed areas. It is also a drought resistant plant. Flowers resemble those of some asters but fleabane has more than 30 petals.

Family: Asteraceae (Aster Family)

Height: 12 to 18"

Flower: 30 - 100 thin white or pinkish petals around a yellow center

Bloom: May - September

Leaf: Hairy, and bluntly toothed, lower ones on stalks, upper leaves lance shaped without stalks

Notes: Daisy fleabane is an aggressive plant and is kept under control at Lake Phalen by removing the flowers.





Rattlesnake master

Eryngium yuccifolium



This perennial herb generally grows on wet or dry prairies. This plant is well adapted to drought and full sun. Its interesting growth form resembles a yucca plant.

Family: Apiaceae (Carrot Family)

Height: 2 to 6 ft.

Flower: Small flowers form a spherical head 0.5 to 1" in diameter, appear prickly

Bloom: July-September

Leaf: Stiff and parallel veined with a spiny edge, up to 1.5" wide



Notes: This plant was a popular medicinal herb used by Native Americans in the 18th and 19th centuries. The seed heads have a honey-like odor.

Flowering spurge

Euphorbia corollata



Flowering spurge is a native prairie plant. It does best in well-drained sand, sandy loam, or silty loam soil on dry sites where it can develop a deep root. It is not patch forming. This spurge will sometimes decline in abundance under competition with other species.

Family: Euphorbiaceae
(Spurge Family)

Height: 1.5 to 2.5 ft.

Flower: Individual flowers are 5 round petal-like sepals, form a flat cluster of white flowers at top of stem

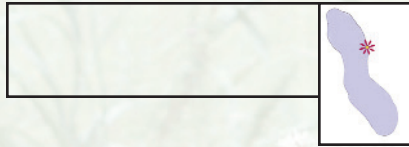
Bloom: July-September

Leaf: Bright green, oval, whorled at top of stem, alternate below



Notes: Exudes a milky sap when stem is broken. Attractive to game birds and song birds.





Large-leaved aster *Eurybia macrophylla*

Large-leaved aster is a perennial plant found in dry and shaded deciduous woods and widely throughout northern forests. It spreads by underground rhizomes, sometimes carpeting the ground layer.

Family: Asteraceae (Aster Family)

Height: 1 to 2 ft.

Flower: Open cluster of white or pale blue flowers (1" wide) with 10-20 petals and a yellow or red center

Bloom: August-October

Leaf: Basal leaves are soft and very large (4-8") and heart-shaped, upper leaves are smaller

Notes: Only about one out of 50 plants produces a flowering stalk each year. Flowering stalks are sticky to the touch. Leaves are distinctive even when the plant is not in flower.



Grass-leaved goldenrod

Euthamia graminifolia



Grass-leaved goldenrod is a perennial plant found in wet meadows and prairies. It prefers wet to moist upland soils and full sun. This plant will spread readily by rhizomes.

Family: Asteraceae (Aster Family)

Height: 1 to 3 ft.

Flower: Small yellow flowers in flat open clusters at the top of the stem

Bloom: July-September

Leaf: Alternate, long and narrow (1-6" long) with three veins



Notes: Provides food and/or habitat for mice, rabbits, deer, grouse, bees and other insects. *E. gymnospermoides* is a diminutive form with only one leaf vein.





Northern bedstraw

Galium boreale

Northern bedstraw is a perennial herb found along stream banks, shorelines, swamps, and along roadsides. It grows well in open, well-drained areas often forming large clumps. This species is sometimes referred to as “wild baby’s breath.”

Family: Rubiaceae (Madder Family)

Height: 1 to 2.5 ft.

Flower: Dense clusters of small ($\frac{1}{4}$ " wide), 4-petaled white flowers at the top of a square stem

Bloom: June-July

Leaf: Narrow ($\frac{1}{4}$ " wide) and toothless in whorls of four, $\frac{3}{4}$ to 2" long

Notes: This plant can become overly aggressive. Northern bedstraw was used in mattresses because of its sweet smell.



Wild geranium
Geranium maculatum



Wild geranium is a common spring-blooming perennial found in dry to moist wooded areas. It prefers shady to partially shaded conditions and well-drained soils. The leaves are similar to those of thimbleweed.



Family: Geraniaceae
(Geranium Family)

Height: 1 to 2 ft.

Flower: Showy, pink or lavender,
5-petaled flower in clusters of
2-10

Bloom: May-June

Leaf: Mostly basal leaves with 5-7
elongated lobes and coarse
teeth, only 2-3 upper leaves

Notes: Deer eat the flowers of wild
geranium and birds eat the maturing
fruit. This species is commonly used in
woodland gardens.



Prairie smoke

Geum triflorum



Prairie-smoke is an attractive plant of dry, sandy or gravelly prairies. It forms a flat rosette of leaves and is best accompanied by other low-growing plants so the purplish flowers and, later, the plumed seed heads can be seen.

Family: Rosaceae (Rose Family)

Height: 0.5 to 1 ft.

Flower: Unusual reddish-purple bell-shaped flowers on long, drooping stalks

Bloom: April-June

Leaf: Basal (4-9" long), divided into several toothed leaflets

Notes: After pollination, flowering stems become erect and seedheads look like feathery plumes.



Jason Husveth

Sneezeweed

Helenium autumnale



Sneezeweed grows on moist sandy or gravelly soil along streambanks and lakeshores and on sandy or silty soil on floodplains. It also grows in wet prairies and at the edges of marshes and swamps in sunny or partly shady locations. It tolerates flooding. It has a distinctive winged stem and showy, yellow flower heads.

Family: Asteraceae (Aster Family)

Height: 2 to 5 ft.

Flower: 10-15 short yellow petals with 3 blunt teeth surround a globular yellow center

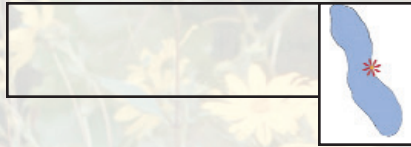
Bloom: August-October

Leaf: Alternate, toothed (3-6" long), leaf base extends down the stem creating "wings"



Notes: Seeds are a food source for songbirds and the flowers attract butterflies. Native Americans made snuff from the flowers, hence the name "sneezeweed."





Woodland sunflower

Heliathus strumosus



Woodland sunflower is a perennial plant that grows well in dry to moderately moist conditions. It can tolerate some shade. This species is commonly found along wooded edges in urban landscapes. It will spread readily via rhizomes.



Family: Asteraceae
(Aster Family)

Height: 3 to 6 ft.

Flower: Golden flowers (2-4" wide) with 8-15 petals in loose clusters at the top of the stem

Bloom: August-September

Leaf: Opposite and lance-shaped (up to 8" long) with shallow or no teeth

Notes: The seedheads are attractive to birds.

Oxeye

Heliopsis helianthoides



Oxeye is a hardy perennial commonly found in prairies with dry to moderately moist soils. It is a drought tolerant species and has long blooming sunflower-like flowers. It is easily established from seed.

Family: Asteraceae (Aster Family)

Height: 3 to 5 ft.

Flower: 8-16 yellow petals surround a raised, darker yellow center (up to 1" wide)

Bloom: June-September

Leaf: Opposite and sharply toothed on a 1" stalk



Notes: Oxeye provides food and cover for birds and small mammals. It also attracts butterflies, bees, moths and hummingbirds.





Alum root *Heuchera richardsonii*

Alum root is a low-growing perennial plant found in moderately wet to dry prairies and woods. It stays in clumps and has attractive, rounded basal leaves and inconspicuous flowers.

Family: Saxifragaceae (Saxifrage Family)

Height: 1 to 2 ft.

Flower: Drooping greenish-brown flowers (1/4" wide) in a branched cluster on a leafless stalk

Bloom: June

Leaf: Basal, rounded or heart-shaped and lobed (3-4" wide)

Notes: Provides habitat for birds and mammals. Native Americans used this plant to treat diarrhea.



Round-headed bush clover

Lespedeza capitata



Round-headed bush clover is a wonderful prairie plant that is most often recognized in winter. Its tall stems have several round seed heads that can be seen above the snow cover. It prefers a deep, well-drained, sandy soil, and is a good colonizer on low nutrient sites.

Family: Fabaceae
(Pea or Bean Family)

Height: 2 to 4 ft.

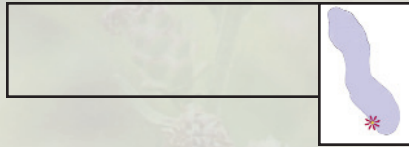
Flower: Creamy white with purple spots in dense clusters in leaf axils toward top of stem

Bloom: July-September

Leaf: Alternate on short stalks with 3 elliptical leaflets (1-1.5" long)

Notes: Seeds are a food source for gamebirds. The combination of three leaflets and round flower cluster in axils make this plant easy to identify.





Rough blazing star *Liatris aspera*

Rough blazing star is a common perennial of dry, sandy prairies. It prefers moderately moist or dry, well-drained upland soils. The flowering stalks provide wonderful cut flowers. This species, along with other blazing stars, is typically found in high quality prairies.



Family: Asteraceae
(Aster Family)
Height: 1.5 to 4 ft.
Flower: Ten or more pink to purple flowers (1" wide) in an unbranched spike
Bloom: August-September
Leaves: Alternate and rodless (2-6" long 1/4" wide) with a white mid-vein

Notes: Nectar source for butterflies, especially Monarchs. Songbirds eat the seeds. Blazing star species are difficult to distinguish with just leaves. Flowers aid in identification.



Meadow blazing star

Liatris ligulistylus



Meadow blazing star tends to grow in moist places such as wet prairies, wet meadow margins, swales, and roadside ditches. It prefers light, sandy loam or loam soils.



Family: Asteraceae (Aster Family)

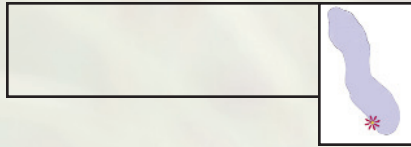
Height: 1 to 3 ft.

Flower: Pink to purple flowers in a spike of stalked, round clusters

Bloom: August-September

Leaf: Narrow and alternate (2-6" long) with a white midvein and no stalk

Notes: Extremely attractive to butterflies. Birds eat the seeds.



Dotted blazing star

Liatris punctata



Dotted blazing star is a drought-tolerant perennial plant found in dry, sandy prairies. It may be solitary but it is usually found in clusters.

Family: Asteraceae (Aster Family)

Height: 0.5 to 1.5 ft.

Flower: Narrow, crowded spikes of rose or lavender flowers along the top 1/3 to 1/2 of the stem

Bloom: July-September

Leaf: Several narrow leaves (less than 1/5" wide), crowded along the stem

Notes: Attractive to birds and butterflies.



H.B. Fuller Company

Wild lupine
Lupinus perennis



Wild lupine is a perennial plant that grows well in prairies with dry, sandy soils and full sun exposure. It prefers acidic soils and can tolerate poor and gravelly soils. Wild lupine is a nitrogen-fixing forb with a thick, deep taproot. It is long lived.



Family: Fabaceae (Pea Family)

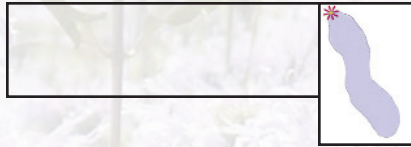
Height: 1 to 3 ft.

Flower: Showy spike-like cluster of blue or purple pea-like flowers (2/3" wide)

Bloom: May-June

Leaf: Palm-like (5-10" wide) with 7-11 small leaflets

Notes: Wild lupine is the only host plant for the larvae of the endangered Karner Blue butterfly.



Wild bergamot

Monarda fistulosa

Wild bergamot is a widespread plant that grows on dry, sandy or gravelly soil on lake or stream beaches, on dry or rocky bluffs or slopes, or in woodlands. It spreads by rhizomes and is also easy to start from seed. The plant is aromatic, especially the flower heads.

Family: Lamiaceae (Mint Family)

Height: 2 to 3.5 ft.

Flower: Lavender and tubular, forming a dense round cluster (1-2" wide)

Bloom: July-August

Leaf: Opposite, hairy and coarsely toothed on short stalks

Notes: Stems are square and hairy, leaves are aromatic when broken. Bergamot is a nectar source for butterflies, bees, and hummingbirds.



Horsemint

Monarda punctata



Horsemint is a unique perennial plant with whorls of flowers above petal-like leaves. It grows well in dry, sandy soil and is drought tolerant.

Family: Lamiaceae
(Mint Family)

Height: 0.5 to 3 ft.

Flower: Tubular yellow flowers with purple spots in several whorls at the top of the stem

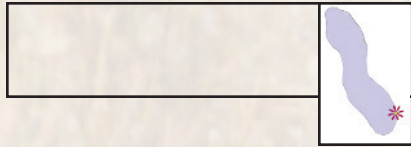
Bloom: July-September

Leaf: Lower leaves are lance-shaped and up 3.5" long, upper leaves are shorter, pinkish, and appear like petals underneath the whorls of flowers



Notes: Hummingbirds use horsemint as a nectar source.

Rob Langer, NST



Stiff goldenrod

Oligoneuron rigidum

Stiff goldenrod is native to dry prairies, and is good for dry sandy or gravelly soil. It is a tall plant with a flat-topped flower head. It is short-lived but readily re-seeds. Like other goldenrods it may become aggressive.



Family: Asteraceae
(Aster Family)
Height: 1 to 5 ft.
Flower: A flat cluster (3-4" wide) of small yellow flowers
Bloom: August-October
Leaf: Alternate, rounded and hairy, leaves are stiff and clasp the stem

Notes: Source of nectar for butterflies and bees. Leaves are eaten by some game birds and seeds are a food source for some small birds.



Slender beardtongue

Penstemon gracilis



Emmet J. Judzewicz, UW-Stevens Point

Slender beardtongue is perennial plant found in prairies and wooded areas with sandy or gravelly soil. It grows best in dry or slightly moist conditions and full or partial sun exposure.

Family: Scrophulariaceae
(Figwort Family)

Height: 8" to 2 ft.

Flower: 10-15 tubular, purple flowers ($\frac{1}{2}$ - $\frac{3}{4}$ " long) in a loose clustered spike at the top of the stem

Bloom: May-June

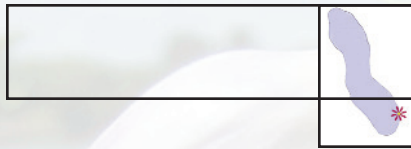
Leaf: Opposite and narrow (up to 3" long) with widely spaced teeth

Notes: The flowers attract hummingbirds. A single hairy stamen protrudes out of the flower, hence the name "beardtongue."



June





Large-flowered beardtongue

Penstemon grandiflorus



Large-flowered beardtongue is a striking plant that grows in dry, sandy or sandy-gravelly prairies. It is short-lived so space is needed in full sun for seedling establishment. It is good in drought-tolerant mixtures.



Family: Scrophulariaceae
(Figwort Family)
Height: 1.5 to 4 ft.
Flower: Large (up to 2") lavender flowers, three lower petals and two upper petals are fused to form a tube
Bloom: May-June
Leaf: Roundish waxy looking leaves, opposite and clasping the stem

Notes: Attractive to hummingbirds.



Prairie phlox

Phlox pilosa



Prairie phlox is a perennial plant found in dry or moist woods and prairies. This plant has a long bloom period providing a burst of color in the spring and will readily seed itself. It is typically found in high quality prairies.

Family: Polemoniaceae (Phlox Family)

Height: 1 to 2 ft.

Flower: A terminal cluster of stalked pink or purple flowers with 5 petals fused into a tube at the base

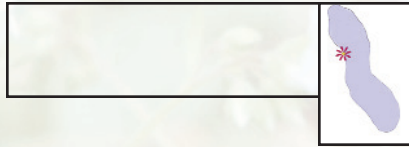
Bloom: May-June

Leaf: Opposite and lance-shaped (up to 4" long), hairy and toothless

Notes: Provides nectar for hummingbirds and butterflies.

Deer will eat the plant. It is also the host plant for the phlox moth, a species of special concern.





Jacob's ladder
Polemonium reptans



Jacob's ladder is an attractive perennial plant that grows well in woodlands with rich, moist soils. It can grow in nearly full shade conditions and will readily seed itself.

Family: Polemoniaceae (Phlox Family)

Height: 1 ft.

Flower: Pale blue bell-shaped flowers in loose clusters on slender, weak stem

Bloom: May-June

Leaf: Many opposite leaflets, resembling a ladder

Notes: Attractive to bees. According to Genesis, the biblical Jacob dreamed of a ladder or stairway to heaven; the plant name Jacob's ladder comes from the ladder-like arrangement of leaves.

Soloman's seal
Polygonatum biflorum



Soloman's seal is a common perennial plant found in dry to moist deciduous woods. It is often found in clumps due to its underground stems (rhizomes). Its arching stem and under-hanging flowers characterize this plant.

Family: Liliaceae (Lily Family)

Height: 1 to 3 ft.

Flower: Groups of 2-10 greenish or cream colored flowers hang from the leaf axils

Bloom: May-June

Leaf: Alternate, toothless and broadly lance-shaped with parallel veins



Notes: Attractive to songbirds and insects. Sometimes confused with false Solomon's seal (*Maianthemum racemosum*), another woodland lily family member.





Pasqueflower is one of the earliest blooming plants in Minnesota. It grows on the dry, sunny slopes of prairies. The small plant, including the flowers, is covered in soft hairs. It is usually found in high quality prairies.

Family: Ranunculaceae
(Buttercup Family)
Height: 4 to 10 inches
Flower: 5-7 white or pale blue petals (1-2" wide) surround a yellow center
Bloom: April-May
Leaf: Basal leaves are deeply lobed, stem leaves are whorled just below the flower and deeply divided with narrow segments

Notes: The soft hairs covering the plant trap air, keeping the plant warm.



Grey-headed coneflower

Ratibida pinnata



Grey-headed coneflower is a tall, attractive plant of prairies and open woodlands. Often found on limestone or limestone-derived soil. It occurs in dry situations as well as in wet-mesic prairies. It does not spread underground, but will gradually spread by seed.



Family: Asteraceae (Aster Family)

Height: 3 to 5 ft.

Flower: Petals are yellow and drooping surrounding a thimble-shaped center that is taller than wide

Bloom: July-August

Leaf: Leaves (up to 7" long) are divided with many thin, toothed lobes, leaves toward top of stem become smaller and less divided

Notes: The stem of grey-headed coneflower is hairy. Provides seed for goldfinch and other songbirds.



Black-eyed Susan

Rudbeckia hirta



Black-eyed Susan is the most common and widespread of our native coneflower-type plants. It grows in sunny upland habitats, in dry to fairly moist conditions, and on a variety of soil types. It is a short-lived perennial but readily re-seeds. A tough, reliable plant, black-eyed Susan continues to bloom with cutting.

Family: Asteraceae (Aster Family)

Height: 1 to 3 ft.

Flower: 10-20 yellow petals surround a brown center, flower heads are wide (2"-3")

Bloom: July-August

Leaf: Alternate and very hairy (2-7") with three prominent veins, stalks are wide and clasp the stem



Notes: Attractive to birds and butterflies.

Cutleaf coneflower

Rudbeckia laciniata



Cutleaf coneflower is a perennial plant found in wet prairies, fields and ditches. It prefers wet or moist upland soils and partially shady conditions. This plant will readily seed itself and also spreads by rhizomes. Cutleaf coneflower can be aggressive.



Paul Berry, University of Michigan

Family: Asteraceae

(Aster Family)

Height: 3 to 10 ft.

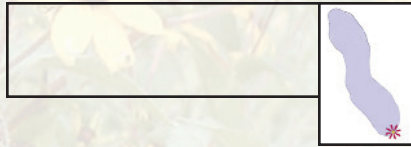
Flower: Several flowers top each plant with 6-10 drooping petals and greenish yellow centers

Bloom: July-August

Leaf: Lower leaves are long (5-8") and have 3-5 sharp lobes with coarse teeth, upper leaves are simple and toothed (2-3" long)

Notes: The flowers attract monarch and fritillary butterflies as well as many songbirds.





Brown-eyed Susan

Rudbeckia triloba

Brown-eyed Susan is a showy, short-lived perennial prairie plant. It grows well in dry or moist soils. It can have as many as 100 flowers on a single plant. This species does well in disturbed areas.

Family: Asteraceae
(Aster Family)

Height: 2 to 5 ft.

Flower: 6-10 yellow petals,
each with grooves
along the length,
surround a brown
center

Bloom: July-September

Leaf: Lower leaves are three-
lobed (3-4" long), upper
leaves have teeth and
no lobes (2-3" long)



Notes: The numerous, smaller
flowers distinguish brown-eyed
Susan from black-eyed Susan.
The young vegetation is very
similar to the vegetation of giant
ragweed. Giant ragweed has
longer and more dense hairs.



Blue-eyed grass
Sisyrinchium campestre



Blue-eyed grass is a tiny gem in the iris family. It is a prairie plant that grows on dry, sandy or gravelly soil on glacial outwash plains, hills, or bluffs. The slender stem and leaves are flattened. Blooming is more common during sunny days.

Family: Iridaceae (Iris Family)

Height: 0.5 to 1 ft.

Flower: 6 blue petals, each with a pointed tip, surround a yellow center, flowers are 0.5" wide

Bloom: May-June

Leaf: Thin, grass-like leaves (up to 2" long)

Notes: The fruit of blue-eyed grass is an attractive round pod.



Zig zag goldenrod

Solidago flexicaulis



Zig zag goldenrod is a perennial plant found in clearings and along the edge of deciduous woods. It prefers dry or moist soils. Unlike most of the goldenrods, the flowers of this plant are located in the leaf joints.



Rob Langer, NST

Family: Asteraceae (Aster Family)
Height: 1 to 3 ft.
Flower: Clusters of yellow flowers (1-2" wide) found at the leaf joints along the upper half of the stem
Bloom: August-September
Leaf: Alternate and oval with coarse teeth (1-3" long); distinctive zig-zag of leaves up the stem

Notes: Birds use this plant as a seed source. Grouse, rabbits and mice eat the leaves. Can be abundant in disturbed areas.



Rob Langer, NST

Showy goldenrod

Solidago speciosa



Showy goldenrod is a bright perennial found in dry or moist prairies and savannas. It has underground stems (rhizomes) and will grow in attractive clumps.



Family: Asteraceae (Aster Family)

Height: 2 to 3 ft.

Flower: Bright yellow flowers in a compact cone-like cluster at the top of the stem

Bloom: August-September

Leaf: Large lower leaves are egg-shaped and toothed, upper leaves are alternate, glossy and oval

Notes: This plant is attractive to birds, small mammals, white-tailed deer, bees, and butterflies.

Goldenrods have been wrongly blamed for causing hayfever, which is generally caused by certain plants that bloom at the same time, such as ragweed.





Heath aster

Symphyotrichum ericoides

Heath aster is a widespread plant of prairies and woodlands, especially on sunny, dry, sandy, rocky, or gravelly soil. It can be planted in rich soil if the site is well-drained. It has a relatively compact form.

Family: Asteraceae (Aster Family)

Height: 1 to 3 ft.

Flower: Many small white flowers with yellow or reddish centers, densely crowded together

Bloom: July-October

Leaf: Numerous, linear, and small (up to 2"), gray-green in color

Notes: Good for erosion control in sunny areas. Attractive to birds and butterflies.



Smooth blue aster

Symphyotrichum laeve



Smooth blue aster is a perennial plant with vivid blue flowers. It is found in moist to dry prairies and savannas. It blooms late in the season providing a burst of lavender-blue color in the fall landscape. It is sometimes the dominant understory species in quaking aspen communities.



Family: Asteraceae (Aster Family)

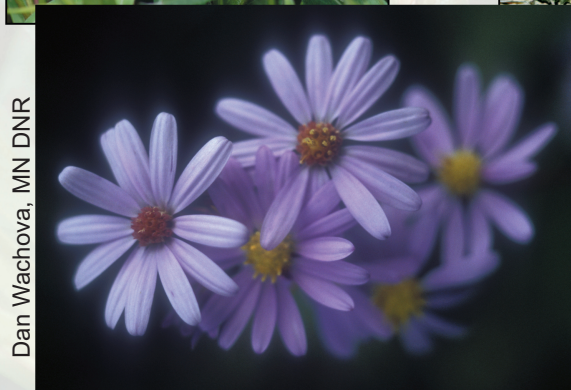
Height: 1 to 3 ft.

Flower: Many flowers with 15-25 lavender-blue petals surround a yellow center (1" wide)

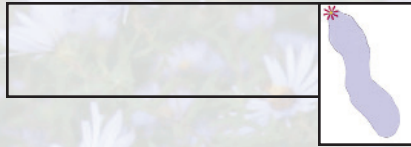
Bloom: August-October

Leaf: Bright green, thick and smooth, clasping the stem

Notes: Attracts the orange sulphur butterfly. Smooth blue aster is also palatable to the white-tailed deer.



Dan Wachova, MN DNR



Aromatic aster
Symphyotrichum oblongifolium



Aromatic aster is a common perennial of dry, sandy prairies. It prefers full or partial sun and will spread out slowly, forming colonies on dry sites. Provides some violet-blue color in the fall season.

Family: Asteraceae (Aster Family)

Height: 1 to 1.5 ft.

Flower: Several violet-blue flowers (up to 1 1/4" wide) with 15-40 petals surrounding a yellow center in large clusters at the end of stems

Bloom: August-September

Leaf: Narrow, greenish-gray with sparse, short hairs

Notes: Attractive to small mammals, deer, birds and butterflies. Notice the petal shape as compared to smooth blue aster.



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Sky blue aster

Symphyotrichum oolentangiense



Skyblue aster is a shrubby perennial plant found in prairies and savannas. It prefers average moist to dry, well-drained soil in full sun.

Family: Asteraceae
(Aster Family)

Height: 2 to 3.5 ft.

Flower: Several flower heads with 13-20 blue petals surrounding a yellow center in a cluster at the end of the stems

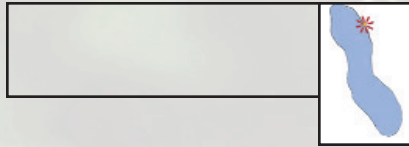
Bloom: August-October

Leaf: Dark green, alternate and hairy (1-4" long), lower leaves somewhat heart-shaped



Notes: Attractive to butterflies.





Early meadow-rue

Thalictrum dioicum

Early meadow-rue is a perennial plant found in wooded areas with dry to moderately moist soils. It blooms early in the spring before the leaves come out on the trees.

Family: Ranunculaceae (Buttercup Family)

Height: 1 to 2 ft.

Flower: Drooping and yellowish-green 5-parted petals fall off early leaving fringe-like filaments behind

Bloom: May

Leaf: Several divided leaves on long stalks, leaflets three-parted with many round-toothed lobes

Notes: Male and female flowers are on separate plants. Leaves are distinctive, even in April.



Prairie spiderwort
Tradescantia occidentalis



Spiderwort is a perennial prairie plant that grows well on dry sandy or loamy soils. It is a low-growing plant that spreads by rhizomes, creating colonies. It will commonly go into summer dormancy, re-blooming in late summer.

Family: Commelinaceae
(Spiderwort Family)

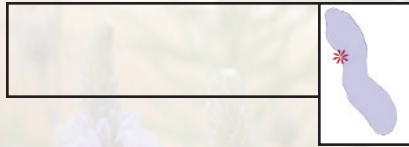
Height: 10 to 24"

Flower: 3 violet petals with a golden center (1-2" wide) form in a cluster of several flowers that bloom only a few at a time

Bloom: June-July

Leaf: Long and grass-like, clasping the stem and folded lengthwise with parallel veins

Notes: Spiderwort exudes a mucus-like sap when broken. Another common name for it is snotweed.



Hoary vervain

Verbena stricta



Hoary vervain is a short-lived perennial that grows in mesic prairies, dry prairies, sand barrens, and sandy old fields. It reproduces best on well-drained, sandy soil but it can grow on richer soil as long as seedlings have open space to get started.



Family: Verbenaceae
(Vervain Family)
Height: 1 to 2 ft.
Flower: Small purple-blue flowers each with 5 fused petals form a spike (2-5"), blooms from the bottom up
Bloom: June-September
Leaf: Opposite, oval and toothed with dense whitish hairs, no stalk

Notes: Stems of hoary vervain are square and hairy. Many bee species are attracted to the flowers.



Golden alexander

Zizia aurea



Golden alexander is an upland herb that grows throughout our region on moist (but not wet) soil in wet meadows, wetland margins, banks of streams, and moist woodlands. It germinates readily on rich soil in sun.

Family: Apiaceae
(Carrot Family)

Height: 1 to 3 ft.

Flower: Tiny yellow
flowers form flat
clusters (5-6") at
top of stem

Bloom: May-June

Leaf: Leaf is divided into
3 stalks each with
3-7 coarsely
toothed, pointed
leaflets



Notes: Golden alexander is
a host plant for the
swallowtail butterfly.



Big bluestem is one of the major grasses of the tallgrass prairie. It grows on a variety of soil types but does best on a deep loam soil where it can develop its large, deep root system. It is a good soil stabilizer.

Family: Poaceae (Grass Family)
Height: 2 to 6 ft.
Seedhead: Purplish in color, spikes resemble turkey feet
Leaf: Green or purplish (0.25" wide)
Stem: Stout, turning bright red, orange or yellow in the fall

Notes: Provides cover and food for gamebirds and songbirds. Foliage is colorful throughout the winter.



Side-oats grama *Bouteloua curtipendula*

Side-oats grama is a common prairie grass of drier regions of North America, especially on dunes, bluffs, gravelly ridges or other places where it isn't crowded out by the taller prairie grasses. The flowers have beautiful flecks of orange color.

Family: Poaceae (Grass Family)
Height: 1 to 3 ft.
Seedhead: Long spike consisting of clusters that fall to one side of the zigzagged stem
Leaf: Less than 0.25" wide with rough edges
Stem: Purplish at nodes

Notes: Important forage grass.





Blue grama is a major prairie grass of drier, shortgrass prairies of North America. It is rare as far east as eastern Minnesota. In our area, it grows on dunes, bluffs, gravelly ridges or places where it is less crowded by taller prairie grasses. It does best on well-drained, sandy soil and forms low, spreading clumps.

Family: Poaceae (Grass Family)
Height: 0.5 to 1 ft.
Seedhead: Comb-like, purplish crescents near top of stems
Leaf: Flat or rolled, very narrow. Up to 7" long, often curling
Stem: Slender and smooth

Notes: Can survive extreme drought.

Fringed brome

Bromus ciliatus



Fringed brome is a cool-season clump-forming grass. It is found in wet meadows, stream banks, and shorelines. It is a short-lived species and does not compete with taller grasses.

Family: Poaceae (Grass Family)
Height: 2 to 3 ft.
Seedhead: Drooping, oat-like in appearance
Leaf: Flat, up to 1/2" wide, green but turning tan in the fall
Stem: Up to 4 ft with hairy nodes



Notes: The seeds are eaten by birds and rodents and the leaves are eaten by geese and deer.



Pennsylvania sedge

Carex pensylvanica

Pennsylvania sedge is common in dry woodland understories and grasslands. It can tolerate a wide range of soil types but prefers well-drained soils. It is a low-growing, cool-season plant that forms colonies. It is often found in extensive, pure stands.

Family: Cyperaceae (Sedge Family)

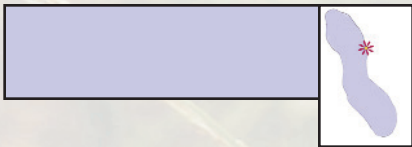
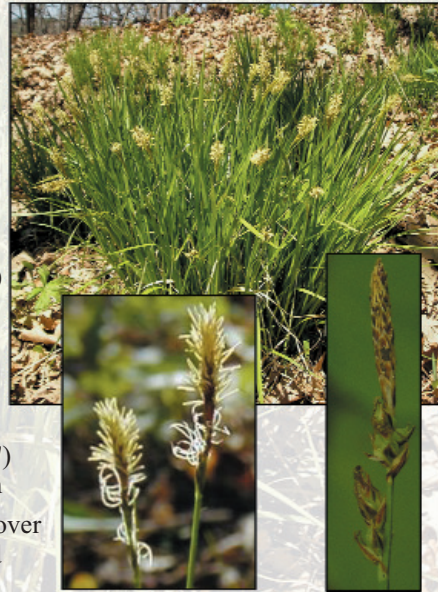
Height: 4 to 18"

Seedhead: Tufted yellow clusters in early spring, brown, thin and compact in summer, smaller male above female

Leaf: Thin and smooth (up to 18")

Stem: Triangular, thin and smooth

Notes: Pennsylvania sedge provides cover and nesting material for waterfowl and gamebirds.



Sprengel's sedge

Carex sprengelii

Sprengel's sedge is common in dry to mesic deciduous woodlands, and on streambanks. It prefers a rich, loam soil but can tolerate well-drained soils. It is somewhat clumped and forms loose patches. It is very attractive among woodland wildflowers.

Family: Cyperaceae (Sedge Family)

Height: 1 to 2 ft.

Seedhead: 2-4 female spikes (up to 1.5" long) dangle from the stem, 1-2 male spikes (up to .0.75") are above the female spikes

Leaf: Thin and smooth, arching

Stem: Triangular

Notes: Provides food and cover for wildlife.





Canada wild rye is native to open habitats such as prairies, streambanks, and lakeshores. Now, it is widely planted in grass or prairie mixtures because it establishes easily and grows fast - useful "nurse" plant while grass species take a few years to establish. It has attractive, nodding, seed heads with long bristles.



Family: Poaceae
(Grass Family)
Height: 2 to 3 ft.
Seedhead: Long curving
bristles, 2-12" long
on nodding stalks
Leaf: Flat or rolled, up to
0.75" wide with
rough edges
Stem: Round, hollow and
smooth
Notes: Attractive to birds and
provides cover for several
wildlife species.

Switch grass

Panicum virgatum



Switch grass is a fast-growing warm season grass. It prefers dry to moist, sandy shores but will tolerate dry and saturated conditions. It is a clump-forming grass and will also readily reseed itself.

Family: Poaceae (Grass Family)
Height: 3 to 5 ft.
Seedhead: Beige, open and pyramid-shaped 8-15" long
Leaf: Smooth and 8-20" long
(1/2" wide) with
conspicuous veins and
white hairs at the base
Stem: Round with a reddish tint

Notes: Important food source for songbirds and gamebirds. Provides cover for many wildlife species.

August



Little bluestem

Schyzacharium scoparium

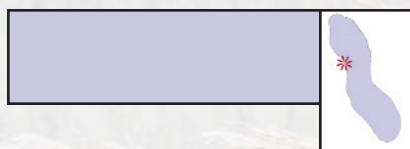
Little bluestem is a dominant grass in North American prairies, especially on drier sites, on sandy or gravelly soil, and on bluffs. If given sun and room to establish, it will develop dense clumps with deep roots.

Family: Poaceae (Grass Family)
Height: 1 to 3 ft.
Seedhead: Several curved spikes alternating along the stem, spike is fluffy in the fall
Leaf: 0.15-0.25" wide, 2-12" long, amber in color
Stem: Reddish to bluish, flattened at base

Notes: Provides food for songbirds, waterfowl, small mammals and deer.



September



Indian grass

Sorghastrum nutans

Indian grass is a common North American prairie grass, especially on rich loam soil or in moist sandy soils. Given time, it may form dense clumps. The tall, slender stems are especially beautiful in the fall.

Family: Poaceae (Grass Family)
Height: 2 to 5 ft.
Seedhead: 4-12" long, open, soft and coppery in color, becoming more contracted and darker when ripe
Leaf: Up to 0.5" wide and 2' long
Stem: Round and hollow with fuzzy nodes

Notes: Attractive to butterflies. Provides winter cover and food for game and songbirds.



August



Prairie dropseed is a perennial, warm-season grass. It is found in dry to moist prairies and savannas. It grows in attractive fountain-like clumps.

Family: Poaceae (Grass Family)
Height: 2 to 4 ft.
Seedhead: Green, 4-8" long, open and pyramid-shaped
Leaf: Narrow and smooth, 1/16" wide
Stem: Smooth and thin

Notes: Provides food and habitat for wildlife. Commonly used as an ornamental grass.



Invasive Plants

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Velvetleaf

Abutilon theophrasti



Velvetleaf is an annual weed with a shallow taproot and fibrous roots. It is native to this area. It is a common weed in gardens, thriving in nutrient-rich soils.

Family: Malvaceae (Mallow Family)

Height: 3 to 4.5 ft.

Flower: 5 yellow petals fused at the base (0.5-1" wide) with a yellow center, on short stalks in upper leaf axils

Bloom: July-August

Leaf: Alternate and heart-shaped (2-6" long and wide) hairy with toothed margins

Management technique: Velvetleaf is managed by preventing seeding from occurring. This is done by cutting with a string trimmer or hand pulling.

Common ragweed

Ambrosia artemisiifolia



Ragweed is a common annual weed of landscapes, nurseries, and meadows. It is native to this area. It prefers heavy moist soils but can grow in sandy soil or clay. Ragweed produces the pollen that is the primary cause of hay fever.



Family: Asteraceae (Aster Family)

Height: 3 to 6"

Flower: Tiny, green and inconspicuous flowers grow on several long spikes

Bloom: August-October

Leaf: Mostly opposite and twice divided (fern-like), can be hairy or smooth

Management technique: Ragweed is managed by preventing seeding from occurring. This is done by cutting with a string trimmer or by hand pulling.



Giant ragweed is an annual weed, native to this area, that can grow extremely tall in fertile soils. It is commonly found in disturbed areas. The pollen from giant ragweed is a cause of hay fever.

Family: Asteraceae (Aster Family)
Height: 4 to 15 ft.
Flower: Inconspicuous, green flowers in spikes at the top of the stem and in the upper leaf axils
Bloom: July-September
Leaf: Opposite, hairy with 3 or 5 pointed lobes

Management technique: Giant ragweed is controlled by cutting down the vegetation with a string trimmer or by hand clipping, before seeding.



Common burdock

Arctium minus

Common burdock is a common weed of landscapes and nurseries. It was introduced from Europe. It is a biennial plant producing a large, leafy rosette the first year and a tall, branched stem the second year.

Family: Asteraceae (Aster Family)
Height: 4 to 5 ft.
Flower: Reddish-purple and thistle-like (0.5-1.5" wide) on green, globular hooked burs
Bloom: July-October
Leaf: Basal leaves are large, heart-shaped (up to 18"), lower leaves are alternate and egg-shaped

Management technique: Burdock is typically managed by spot spraying plants with glyphosate.



May



Yellow rocket is an annual or biennial weed native to Eurasia. It grows well in damp, nutrient rich loamy or sandy soils. Each plant produces thousands of seeds.

Family: Brassicaceae (Mustard Family)

Height: Up to 3 ft.

Flower: Small, bright yellow in spike-like clusters, long, skinny, green pods when mature

Bloom: May-June

Leaf: Basal leaves with wavy margins and rounded lobes, stem leaves alternate with smaller lobes

Management technique: This plant is managed by preventing seeding from occurring. This is done by cutting with a string trimmer or hand pulling.

Hoary allysum

Berteroa incana



Hoary allysum is a common weed of the northern states, native to Europe. It is usually an annual but occasionally it is a biennial plant. It is most abundant in dry, disturbed areas.

Family: Brassicaceae (Mustard Family)

Height: 1.5 to 2 ft.

Flower: Individual flowers consist of 4 white, deeply-notched petals, they form a cluster at the top of multiple stems

Bloom: June-August

Leaf: Alternate, small with a gray fuzz

Management technique: Hoary allysum is an annual or short-lived perennial and is managed by preventing seed formation. This is done by cutting the plant with a string trimmer.

This cool-season Eurasian grass was introduced into the United States in the 1800s and has spread across much of North America. It is a highly competitive weed of roadsides, forests, prairies, and lightly disturbed sites. Smooth brome thrives in a wide range of soils.

Family: Poaceae (Grass Family)

Height: 1.5 to 3 ft.

Seedhead: Open panicle up to 8" long, tending to droop in an arch

Leaf: The numerous leaf blades are flat and hairless, 4-13" long and up to 1/2" wide



Management techniques: Smooth Brome is most effectively controlled through a combination of chemical application, glyphosate or a grass-specific herbicide, and late spring prescribed burns.

Creeping bellflower

Campanula rapunculoides

Creeping bellflower is a perennial weed from Eurasia. It was introduced to the U.S. as a garden plant. It spreads by underground stems and seeds.

Family: Campanulaceae
(Bellflower Family)

Height: 1 to 3 ft.

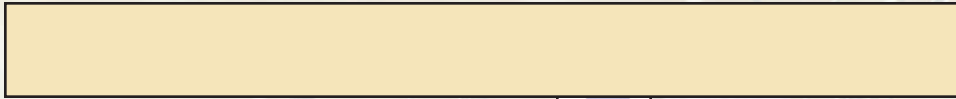
Flower: Blue, bell-shaped (1-2" long) hanging downward along one side of the tall stem

Bloom: June-August

Leaf: Lower leaves heart-shaped, stem leaves lance-shaped with small teeth

Management techniques: Creeping bellflower is controlled by hand pulling the entire plant with as much root material as possible and spot treating with glyphosate.





Spotted knapweed is a biennial or short-lived perennial, native to Europe and Asia. It spreads rapidly in dry, disturbed environments. It releases chemicals into the soil that can inhibit the growth of other plants.

Family: Asteraceae (Aster Family)

Height: 2 to 3 ft.

Flower: Many small pink to purple petals on long stalks from leaf axils

Bloom: July-September

Leaf: Alternate, gray-green, divided, smaller towards top of stem

Management techniques: Spotted knapweed is managed by cutting at time of flowering and/or chemical treatment with glyphosate or clopyralid. Small plants can be hand pulled.

Lambsquarters

Chenopodium album



Lambsquarters is an annual weed commonly found in gardens and landscapes. It was introduced to the United States from Europe. It is capable of producing thousands of tiny seeds.



Family: Chenopodiaceae
(Goosefoot Family)

Height: Up to 3 ft.

Flower: Inconspicuous clusters of small greenish-white flowers, in spikes, in the upper leaf axils

Bloom: June-September

Leaf: Alternate, triangular with irregular rounded teeth, with a mealy gray coating

Management technique: Lambsquarters is managed by preventing seeding. This is done by pulling or by removing seedheads with a string trimmer.



Oxeye daisy

Chrysanthemum leucanthemum

Oxeye daisy is a perennial weed native to Europe that can out-compete natives in disturbed areas. It is spread by both seeds and short rhizomes. It should not be confused with Oxeye (or early sunflower) which is a yellow native sunflower.

Family: Asteraceae (Aster family)

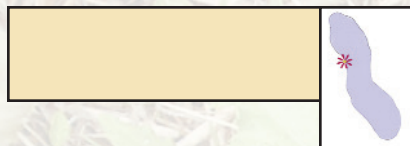
Height: 12-24"

Flower: White rays with yellow central disc, 2" across, blooms all summer

Bloom: June-September

Leaf: Alternate, deeply cut and lobed. Lower leaves are stalked, upper leaves are stalkless or clasping.

Management techniques: Typically oxeye daisy is controlled by spot treating with glyphosate. For small infestations repeated hand pulling is also effective.



Canada thistle

Cirsium arvense

Canada thistle is a perennial plant, spreading via underground rhizomes. It is native to Europe. One plant can spread to form a large colony. It can invade both dry and wet areas.

Family: Asteraceae (Aster Family)

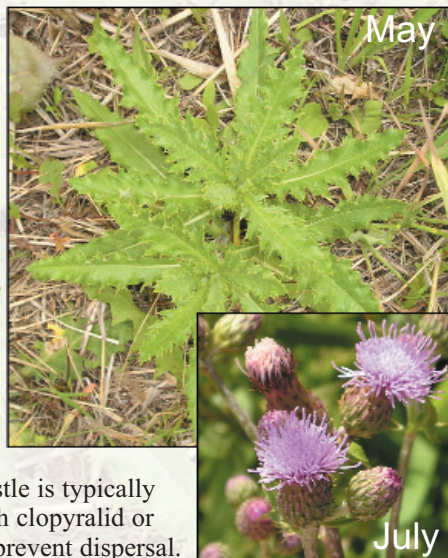
Height: 2 to 5 ft.

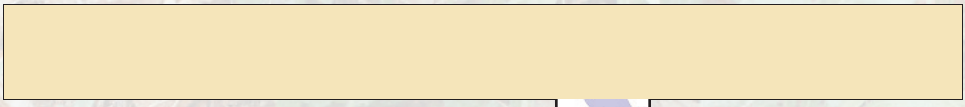
Flower: Clusters of slender pink-purple, petal-like flowers (up to 1" wide) on the upper branches of the stem

Bloom: June-August

Leaf: Alternate, deeply lobed with prickly edges

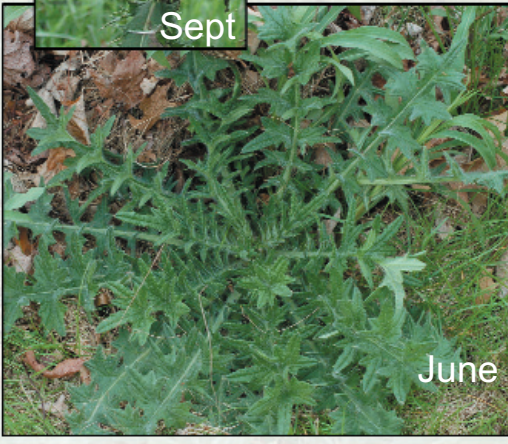
Management techniques: Canada thistle is typically controlled via chemical treatment with clopyralid or by cutting and bagging seedheads to prevent dispersal.





Virginia Gaynor

Sept



June



Bull thistle is a biennial plant introduced from Europe and Asia in the early 1800's. It prefers rich, moist soil. It can be found in a variety of habitats but will readily invade disturbed areas.

Family: Asteraceae
(Aster Family)
Height: 3 to 6 ft.
Flowers: Dense head of purple flowers (1 1/2" wide) above spiny bracts
Bloom: July-September
Leaf: Alternate, coarsely lobed and toothed, with sharp spines

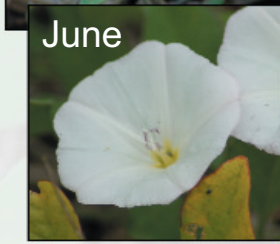
Management techniques: Hand pull individual plants or apply glyphosate to rosettes when possible. Weed whip flowers to prevent formation of mature seed when necessary.

Field bindweed

Convolvulus arvensis



May



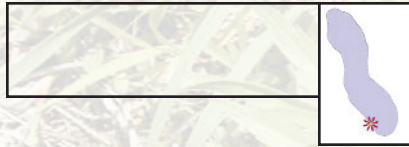
June

Field bindweed is a plant with an aggressive rhizomatous root system. It also spreads readily by seed. It grows rapidly around other plants and can choke or pull down other plants.

Family: Convolvulaceae
(Morningglory Family)
Height: 2"-5 ft. vine

Flower: White, sometimes pink, arrow or bell-shaped, less than 0.5-2" wide.
Bloom: June-September
Leaf: 1-2" arrowhead shaped leaves

Management technique: Due to the extensive root system, bindweed is extremely difficult to control. Repeated hand pulling will reduce infestations.



Horseweed

Conyza canadensis

Horseweed is an annual weed that invades disturbed areas such as shorelines or drawdown zones. It is native to this area. It is usually found in groups of many plants. It can be confused with blazing star prior to flowering.

Family: Asteraceae (Aster Family)

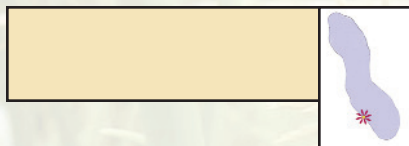
Height: Up to 6.5 ft.

Flower: Tiny inconspicuous white flowers in a branched spike, becoming fuzzy when mature

Bloom: July-October

Leaf: Numerous, alternate and hairy (4" long), some with shallow, blunt teeth

Management technique: Horseweed is an annual plant and therefore it is managed by preventing seeding. This is done by cutting down the plant with a string trimmer or by hand pulling the plant.



Yellow nutsedge

Cyperus esculentus

Yellow nutsedge is a perennial weed found in damp or wet soil. It was introduced to the area from Europe. It spreads predominately by tubers but also via underground stems. Dormant tubers are viable for 10 or more years.

Family: Cyperaceae (Sedge Family)

Height: Up to 2.5 ft.

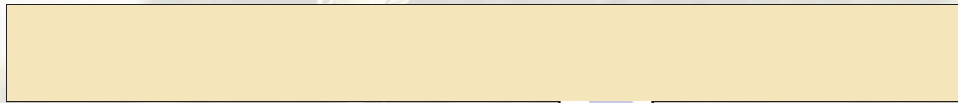
Seedhead: Yellowish-brown clusters of spikes on long stalks at the top of the stem

Leaf: Yellowish-green, shiny with ridges along the midvein, in groups of three from the base of the plant

Stem: Three-sided and usually single-stemmed.

Management techniques: Hand pulling and spot spraying with glyphosate.





June

Orchardgrass is a perennial grass, native to Europe, that invades landscapes and disturbed sites. It grows in clumps and can be found in areas of full sunlight as well as partial shade.

Family: Poaceae (Grass Family)
Height: 2 to 3 ft.
Seedhead: Interrupted, whitish-green clusters in a branched spike
Leaf: Coarse blue-green blades (1/4" wide) with a middle fold, rough edges, and a papery projection where the leaf meets the stem
Stem: Blue-green, round and smooth

Management techniques: Chemical treatment with glyphosate, and cutting of the seedheads.

Barnyard grass

Echinochloa crus-galli



Barnyard grass is a warm-season annual grass introduced to the United States from Eurasia. It is a clump-forming grass usually found in disturbed habitats. The first frost of the season will kill the plant.



August

Family: Poaceae (Grass Family)
Height: 3 to 5 ft.
Seedhead: Green or purplish, coarsely branched (2-8 1/2" long)
Leaf: Flat 4-12" long and 1/4- 1/2" wide and smooth or somewhat rough
Stem: Thick, can be prostrate

Management technique: Cut seed heads before they mature.

Creeping Charlie (also called ground ivy or gill-over-the-ground) is a low-growing, viney perennial weed that does well in moist, shady areas of lawns, gardens and disturbed areas. Like other mints, this Eurasian native has a square stem.

Family: Lamiaceae (Mint family)

Height: 5"-8"

Flower: Small tubular purple to light blue blossoms on short stalks

Bloom: April-June

Leaf: Rounded, opposite, long stalked and bluntly toothed, bright green and shiny with palmate veins.

Management technique: Creeping Charlie is very difficult to control. It is managed by chemical treatment with glyphosate or a broad-leaf herbicide. Spring and fall applications seem most effective.



Butter and eggs

Linaria vulgaris

Butter and eggs is a perennial weed that is becoming a problem across North America. It spreads mainly by extensive creeping rhizomes and can regenerate from root fragments as small as one cm.

Family: Scrophulariaceae (Snapdragon family)

Height: 1 to 2 ft.

Flower: Bright yellow/orange flowers in an elongated cluster of 15-20 flowers, similar in appearance to snapdragon blooms

Bloom: July-September

Leaf: Alternate, smooth, and narrow 0.5-1.5" long

Management technique: Butter and eggs is difficult to control due to the extensive root system. Hand pulling will reduce populations, but is labor intensive.



Tatarian honeysuckle

Lonicera tatarica



Exotic honeysuckle is a non-native shrub introduced to the United States as an ornamental. It is found in forested areas and out-competes native forest shrubs. It also shades out ground cover species and depletes soil moisture.



Family: Caprifoliaceae
(Honeysuckle Family)
Height: 5 to 12 ft.
Flower: Creamy white, pink or red in color, tubular (<1" long), found in pairs in the leaf axils.
Bloom: May-June
Leaf: Opposite and oval on short stalks, no teeth

Management techniques:
Seedlings can be pulled.
Large plants are cut and the stumps treated.

Birdsfoot trefoil

Lotus corniculatus



July

Birdsfoot trefoil is a mat-forming perennial native to Europe. It is often seeded for soil stabilization but easily escapes into other areas. It can grow in a wide variety of soil types and invades turfgrass and meadows, choking out other plants.

Family: Fabaceae (Pea or Bean Family)
Height: 1 to 2 ft.



July

Flower: Irregular, bright yellow flowers with fine red lines in clusters of 2-6 on 2-4" stalks
Bloom: June-September
Leaf: Alternate, with 3 oval leaflets and two additional leaflets towards the base

Management techniques: Birdsfoot is spot-sprayed with the herbicide clopyralid. It is also cut back when flowering to prevent it from seeding.

Purple loosestrife was introduced from Europe as a garden plant and has become a major threat to wetlands, wet meadows, stream banks, and pond and lake edges. It spreads quickly and forms dense stands that crowd out other plants.

Family: Lythraceae
(Loosestrife Family)

Height: 3 to 7 ft.

Flower: Small magenta flowers form several long spikes at the top of the plant

Bloom: July-September

Leaf: Opposite or in whorls of 3 (up to 4" long), no stalks, sometimes clasping the square or multiple edged stem

Management technique: Small plants are dug out. Large plants are controlled with glyphosate.



Alfalfa

Medicago sativa



Alfalfa is a perennial weed introduced to the United States from Europe as a food crop for farm animals and as a way to improve soil fertility. It is found in drier soils. It commonly falls down under its own weight when mature.

Family: Fabaceae
(Pea or Bean Family)

Height: 1 to 3 ft.

Flower: Dense clusters (1-2" long) of blue to purple flowers on stalks from upper leaf axils

Bloom: May-September

Leaf: Alternate, with three leaflets (clover-like) each with a tiny hair-like point

Management techniques: Alfalfa is controlled by cutting before flowering to prevent seeding. Small plants are dug.





Sweet clover is a biennial plant introduced from Europe. It invades prairies and disturbed areas shading out native vegetation. The plants are very fragrant.

Family: Fabaceae (Pea or Bean Family)

Height: 3 to 5 ft.

Flower: Small yellow or white flowers crowded into a 4" spike throughout the plant

Bloom: June-August

Leaf: Alternate, three small leaflets with fine teeth, the middle leaflet has a short stalk

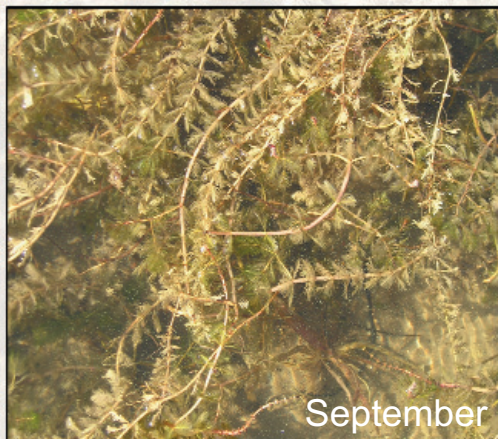
Management techniques: Sweet clover is controlled by cutting the vegetation down before flowering to prevent the plant from seeding. Small plants can be pulled by hand or dug.

Eurasian water-milfoil

Myriophyllum spicatum



Eurasian water-milfoil is an extremely invasive, submerged aquatic weed. It can form dense mats of vegetation. It prevents light from penetrating the surface of the water and displaces native vegetation. It can spread via rhizomes, small stem fragments, or axillary buds.



Family: Haloragaceae
(Water-milfoil Family)

Height: Floating, can grow in depths up to 15ft.

Flower: Small yellow flowers in a spike, emerging 2-4" above the surface of the water

Bloom: August

Leaf: In whorls around the stem, each leaf has 12 to 21 pairs of leaflets

Management techniques: This weed can be mechanically harvested or treated with herbicides

Wild parsnip

Pastinaca sativa

Wild parsnip is a perennial plant introduced from Eurasia. It is grown as a root vegetable and has escaped from cultivation. The sap from this plant can cause a rash and blistering if in contact with skin.

Family: Apiaceae

(Carrot Family)

Height: 1 to 5 ft.

Flower: Small yellow flowers in a sparse, flat-topped cluster (2-6" wide)

Bloom: June-August

Leaf: Alternate, made up of 5-15 sharply toothed leaflets

Management techniques: Wild parsnip is not currently found at Lake Phalen, but is becoming more prevalent around the state. Gloves should be worn when removing this plant.



Reed canary grass

Phalaris arundinacea

Reed canary grass is a perennial, cool-season grass. It spreads via rhizomes forming large stands and out-competing desirable vegetation. It is a major threat to wetlands and wet natural areas.

Family: Poaceae (Grass Family)

Height: 2 to 6 ft

Seedhead: Dense spike of green to purple florets (up to 10") at the top of the stem, changing to a straw color when mature

Leaf: Blades are flat with rough edges (0.25-0.3") wide and up to 10" long, papery projection where the leaf meets the stem

Stem: Bluish-green, round and smooth

Management techniques: Reed canary grass is controlled with chemical application of glyphosate. It can be mowed in late May to prevent seed production.



Common plantain

Plantago major



Common plantain is a perennial weed common to turfgrass and landscapes. It was introduced to the area from Europe. It is a very tolerant plant growing in compacted soils and both wet and dry conditions. It spreads by producing many tiny seeds.



Family: Plantaginaceae

(Plantain Family)

Height: Up to 1 ft.

Flower: Dense spikes of inconspicuous, yellowish-white flowers arising from the basal rosette

Bloom: June-September

Leaf: Rosette with smooth, oval leaves, veins run parallel to the toothless margins

Management technique: Flowering spikes are cut down with a string trimmer before they set seed.

Common buckthorn

Rhamnus cathartica



June



Common buckthorn is a shrub native to Eurasia. It can thrive in a variety of soil and light conditions. It tends to form dense stands shading and crowding out native vegetation and preventing other plants from germinating.

Family: Rhamnaceae (Buckthorn Family)

Height: Up to 22 ft.

Flower: Clusters of yellow-green flowers with 4 petals on the stem near the leaf base, become black berries when mature.

Leaf: Oval with small teeth and a pointed tip and upcurved veins

Twig: Light brown with white spots, often with a spine at the tip

Management techniques:

Seedlings can be pulled. Large plants are cut and the stem treated with a concentrated glyphosate.



June

Curly dock is a perennial weed introduced to the United States from Europe. It grows well in nutrient rich, damp soils. It spreads primarily by seed.

Family: Polygonaceae
(Smartweed Family)
Height: Up to 3.5 ft.

Flower: Green, inconspicuous, in elongated spikes on the upper portions of the stem, become reddish-brown when mature

Bloom: June-August

Leaf: Alternate and long (12") with distinctly wavy margins, becoming reddish when mature

Management techniques: Curly dock is chemically treated with glyphosate. Flowering plants are cut down with a string trimmer before seeding occurs.



Crown vetch *Securigera varia*

Crown vetch is a perennial plant introduced from Europe and southeast Asia. It can spread aggressively by underground stems (rhizomes) invading prairies and disturbed areas.

Family: Fabaceae (Pea or Bean Family)
Height: 1 to 2 ft.

Flower: Dense round clusters of pink to white flowers on long stalks extending from the leaf axils

Bloom: May-August

Leaf: Divided (feather-like), 15-25 oblong leaflets

Management techniques: In open areas, treat with glyphosate. In established plantings, hand pull as much of plant as possible, then treat remainder with clopyralid.



Virginia Gaynor



Yellow foxtail is a clump-forming summer annual grass. It is typically found in full sun, and in moist to slightly dry conditions. This Eurasian import spreads by seed, and can be very aggressive in disturbed areas.



Family: Poaceae (Grass Family)
Height: 6" to 3 ft.
Seedhead: Cylindrical, 2"-5" spike-like panicle that looks like a short furry tail. Spikelets are green and bristles yellow June-September, with the entire head turning yellow-tan upon maturity
Leaf: Blades are flat & smooth, 0.5" wide & up to 12" long, with noticable hairs on the upper leaf surface and sheath
Stem: Flattened and smooth, often reddish at the base
Management techniques: Foxtail is controlled by pulling or cutting seed heads before seeding.

White campion
Silene latifolia



White campion is a weed, native to Europe, found on rich, well-drained soils in full sun. It can be an annual, biennial, or short-lived perennial. Night flying insects pollinate this plant.

Family: Caryophyllaceae (Pink Family)
Height: Up to 3 ft.



Flower: 5 deeply notched white or light pink petals with a large, green bladder behind the flower
Bloom: May-September
Leaf: Opposite, dull green and hairy (3-4" long and (0.25- 1" wide), rosette when young
Management techniques: White campion is controlled by cutting with a string trimmer or pulling.

Bittersweet nightshade is a perennial vine introduced from Eurasia as a cultivated ornamental. It can be found in a variety of habitats usually on moist soils. The vegetation and berries have an unpleasant odor and are poisonous.

Family: Solanaceae
(Nightshade Family)

Height: Up to 9 ft.

Flower: Clusters of flowers with dark purple petals and a protruding yellow center

Fruit: Round, red berries

Leaf: Alternate along stem, most with a large middle lobe and two smaller side lobes (2-4" long)

Management techniques: Handpulling is an efficient method of control.



June



July

Sow thistle

Sonchus arvensis

Sow thistle is a perennial weed native to Eurasia. It spreads via rhizomes and windblown seeds, invading disturbed areas and quickly spreading. It prefers rich, fine-textured soils. It exudes a milky sap when broken.

Family: Asteraceae (Aster Family)

Height: 2 to 5 ft.

Flower: Bright yellow, dandelion-like (up to 2" wide), fuzzy when mature

Bloom: June-August

Leaf: Alternate, deeply lobed with prickly edges

Management techniques: Hand pulling or cutting and bagging seedheads where invasion is extensive.



July



July



May

Dandelion is a well known, perennial weed that readily invades disturbed areas. It was introduced to the United States from Europe. It will grow well in many soil types. It spreads by windblown seeds and new plants grow from broken segments of the taproot. It exudes a milky sap when broken.



May

Family: Asteraceae
(Aster Family)
Height: 2-18"
Flower: Thin, bright yellow petals
in a cluster at the top of the
stem
Bloom: May-September
Leaf: Oblong and sharply lobed
(2-16" long), with lobes
pointing toward the base

Management techniques: Cut down
flowers with a string trimmer, or
spot spray if in dense clumps.

Poison-ivy

Toxicodendron radicans

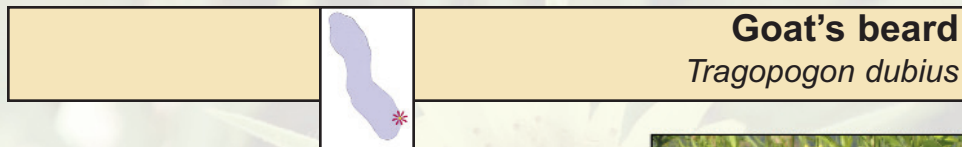


May

Poison-ivy is a native perennial low shrub or woody vine. It grows well under a variety of conditions, doing best in slightly shaded areas. It can invade disturbed sites, woodlands, and wet areas by seeds and by creeping rhizomes. White berries persist on plant through the winter.

Family: Anacardiaceae (Cashew Family)
Height: Shrubs can reach 7 ft.
Flower: Loose clusters of small white
flowers in leaf axils, develop
into white berries when mature
Bloom: May-June
Leaf: Alternate on long stalks, 3
leaflets (2-4" long), shiny with
irregular toothed or wavy margins

Management techniques: Cut and treat
stems or apply a broadleaf herbicide.



Goat's beard *Tragopogon dubius*

Goat's beard is a biennial weed introduced to the United States from Europe. It is commonly found on disturbed sites with dry soil. The vegetation exudes a milky sap when broken.

Family: Asteraceae (Aster Family)

Height: 1 to 3 ft.

Flower: Large (1-2.5" wide) with many yellow petals (dandelion-like), round fuzzy plumes when mature

Bloom: June-July

Leaf: Grass-like and clasping the stem

Management technique: Goat's beard is controlled by cutting flowering heads with a string trimmer before seeding occurs.



June



June



Red clover *Trifolium pratense*

Red clover is a perennial weed introduced from Europe as a hay and pasture crop. It can thrive in wet or dry conditions, preferring full sun. It is still grown as a rotation crop because it can fix nitrogen, improving soil fertility.

Family: Fabaceae
(Pea or Bean Family)

Height: 6 to 24"

Flower: Small, pink flowers in round dense clusters at the top of the stem

Bloom: Late May-September

Leaf: Alternate, 3 oval leaflets with white markings

Management techniques: Hand pulling or cutting of flowers with a string trimmer.



White clover

Trifolium repens



June



White clover is a perennial weed introduced to North America from Eurasia. It is a mat-forming plant invading turfgrass and landscapes. It can grow in a variety of soil types.

Family: Fabaceae (Pea or Bean Family)

Height: 4 to 10"

June



Flower: Round clusters of small, white or pinkish flowers on stalks

Bloom: May-September

Leaf: Alternate, 3 oval leaflets with white markings

Management techniques:
Controlled with herbicides; spot spray with clopyralid during growing season, or with glyphosate late in the season.

Hybrid cattail

Typha x glauca



Hybrid cattail is an invasive plant produced by the crossing of *T. angustifolia* and *T. latifolia*. It is commonly found in semipermanent marshes and wetlands and will often out-compete its parents and other wetland plants. It spreads vegetatively by rhizomes and clone fragmentation.



Family: Typhaceae
(Cattail Family)

Height: 6 to 10 ft.

Seedhead: Male (pale brown) and female portions (dark brown) separated by up to 2"

Leaf: Green, flat 0.5" wide

Stem: Round and smooth

Management technique: Stems are wiped with a glyphosate herbicide labeled for use around water.

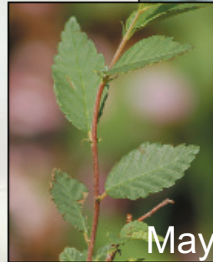
Control takes place in late summer.

Siberian elm is a deciduous tree introduced to the United States from eastern Asia. Seed germination rate is high and it can dominate disturbed areas quickly. This species can tolerate poor soils and low moisture.

Family: Ulmaceae (Elm Family)
Height: 30 to 60 ft.
Flower: Greenish in dense, drooping clusters before leaf development
Leaf: Alternate, toothed and egg-shaped (1-2" long)
Twig: Grayish and zig-zagged

Management techniques: Hand-pull seedlings in early years of restoration establishment. When restoration matures, seedlings should be controlled by prescribed burns.

May



May

Stinging nettle

Urtica dioica

Stinging nettle is a perennial weed. It spreads via rhizomes creating large colonies. It grows well in moist, nutrient rich soil. The undersides of the leaves have stinging hairs that can irritate the skin, causing swelling and itching where contact occurs.

Family: Urticaceae (Nettle Family)
Height: Up to 6 ft.
Flower: Small, greenish-yellow, inconspicuous flowers in long drooping clusters in the leaf axils
Bloom: May-October
Leaf: Opposite, egg-shaped with toothed margins (2-6" long)

Management techniques: Hand pull carefully or cut the flowers before they set seed.

July





Common mullein is a biennial weed introduced from Europe. It is commonly found on dry, gravelly or rocky soil. Dead stems will often persist for several years.

Family: Scrophulariaceae
(Figwort Family)

Height: 2 to 6 ft.

Flower: Thick, dense spike (1-2 ft. long) of yellow flowers with five petals

Bloom: June-September

Leaf: Basal leaves are large and velvety, grayish-green, stem leaves are alternate and clasp the stem

Management techniques: Rosettes are spot sprayed with glyphosate. Mature plants are hand pulled or cut before seeding can occur.



Fall and Winter Foliage

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Swamp milkweed
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Butterfly milkweed
Asclepias tuberosa p. 91



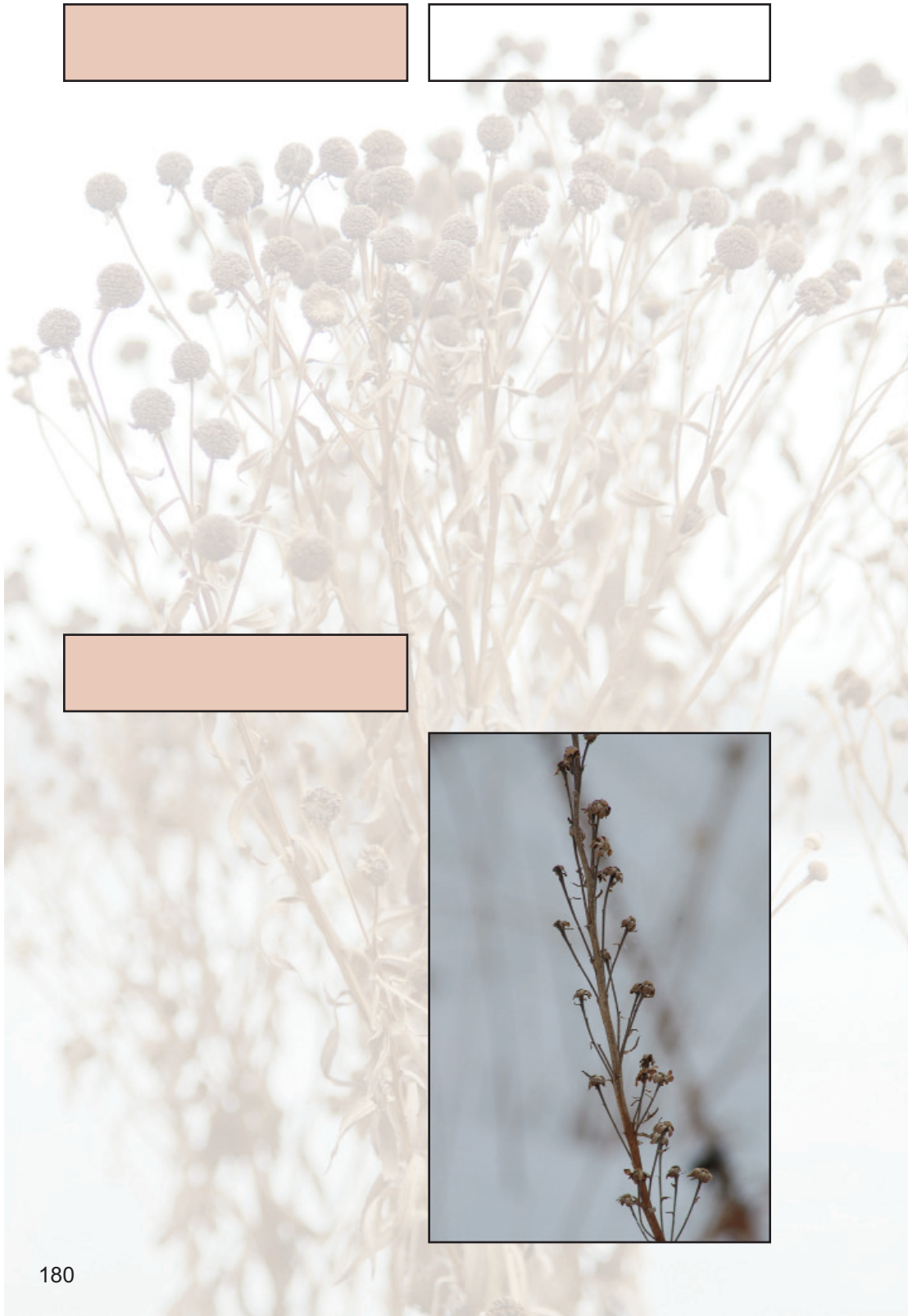


Lake sedge

Stiff tickseed







Cardinal flower

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Blue lobelia

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Monkey flower

Mimulus ringens p. 61



Wild bergamot

Monarda fistulosa p. 121





Black-eyed susan

Rudbeckia hirta

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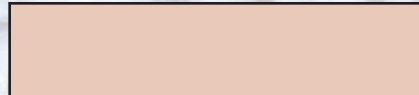
Brown-eyed susan

Rudbeckia triloba

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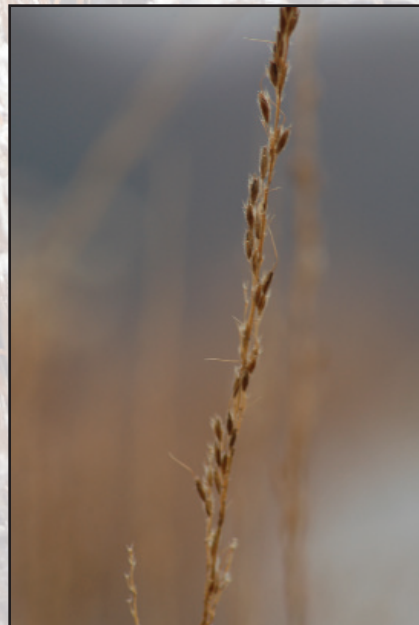
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Glossary

Annual plant - A plant with a life cycle of one year or less.

Biodegradable - Any material that can be broken down (or decomposed) by natural processes involving, for instance, bacteria, fungi, or plants.

Bio-engineering - The discipline of employing living plant material to stabilize areas susceptible to erosion. Certain approaches also have other benefits, e.g., habitat creation, aesthetics.

Biolog - Coconut or coir fibers fabricated into a roll that resembles a log. Fibers are held together with coir netting. Biologs are 100% biodegradable.

Biennial plant - A plant that completes its life cycle in a two-year period.

Buffer - A strip of vegetation that is located between developed land and a lake, stream, or wetland.

Clopyralid - A herbicide (3,6-dichloropicolinic acid) used to treat invasive broad-leaf weed species.

Cover crop - A plant species used to quickly establish a temporary cover of vegetation. Annual rye and oats are common cover crops used in ecological restoration.

Cut bank - An area of shore with a vertical drop above the water's edge and exposed soil - usually caused by erosion.

Drawdown - Lowering of the water level in a body of water.

Ecological restoration - The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed (The Society of Ecological Restoration).

Erosion - A process (e.g., water, wind, ice) that causes the displacement of soil. Excessive lakeshore erosion results in unstable, cut banks and soil loss into the water.

Erosion control blanket - Blankets or large pieces of fabric typically made of straw or coconut. Their main function is to temporarily stabilize slopes prior to vegetation establishment. They work to hold soil in place and increase the rate of seed germination.

Excavator - A machine used to dig and move soil. The bucket arm, which can turn 360 degrees, is mounted on a cab.

Fecal matter - Solid or semisolid waste material excreted from the digestive tract.

Foliage - The leaves of a plant.

Forb - A plant with a soft, rather than a woody stem, that is not a grass or grass-like.

Glyphosate - A systemic, nonselective herbicide [N-(phosphonomethyl) glycine] used to treat grass and broadleaf weed species.

Habitat - The place where a plant or animal lives and is able to acquire food, water, and shelter.

Herbaceous (herb) - Plants with non-woody stems with leaves and stems that die back in winter in the temperate zone.

Herbivory - The consumption of plant tissue.

Invasive plant - A plant that acts like a weed, spreading aggressively and crowding out desirable native plant species.

Inflorescence - The collection of flowers and their associated parts on a plant.

Mulch - Material spread onto soil to reduce weeds and to retain soil moisture. Shredded hardwood mulch has been used in the Lake Phalen restoration.

Nectar - Produced by flowers, it is a liquid rich in sugars that attracts pollinating animals.

Non-native plant - A plant living out of its natural or historical range of distribution.

Native plant - A plant that has historically grown and reproduced in an area without any human intervention.

Perennial plant - A plant that has a life cycle of over two years.

Phenology - The study of patterns of biological activity through the seasons, such as plant flowering.

Plant colonization - The process in which plants establish a presence in a given land area.

Plant Plug - A small plant, usually 2" in diameter, grown in a container. Native plant plugs are transplanted to establish target plant communities in restoration areas.

Prescribed burn - The intentional use of carefully controlled fire to manage natural areas.

Prevegetated mat - A rectangular piece of erosion control blanket (approximately 1.5 square feet) that has been planted with a native plant species and grown in the greenhouse. These mats are installed along shorelines where quick plant establishment is desired.

Remnant plant community - A relatively intact native plant community, common during pre-settlement, which has withstood development and other human activities.

Revegetate - To reestablish plant species in an area that has been previously disturbed.

Rhizome - A horizontal underground stem.

Riprap - Rock brought in and placed along the shoreline to reduce erosion.

Runoff - The portion of precipitation that moves across land as surface flow and enters streams, lakes, and wetlands.

Shoreland - The area of land from the water's edge progressing upland.

Skid steer - A compact, four wheel drive piece of construction machinery - most commonly outfitted with a bucket attachment that is used for digging and soil grading.

Slope - Often used to describe the measurement of the steepness or change in elevation (a horizontal: b vertical). Thus, a 1:1 slope is much steeper than a 10:1 slope.

Species - A taxonomic group whose members can interbreed, making them a distinct class.

Spot treatment - Application of an herbicide to a small patch of weeds or to individual weeds in a managed natural area or restoration.

Stamen - The pollen generating reproductive organ of a flower.

Swale - A linear depression or channel designed to move and to some degree infiltrate water from a storm event.

Taproot - The large principal root that grows vertically downward, giving off smaller lateral roots.

Toe of the slope - The bottom or base of a shore slope.

Tuber - The thickened part of the rhizome supporting nodes and buds; modified for food storage.

Upland - Land that is higher than the lake's elevation during normal conditions - this land area rarely floods.

Watershed - Land area from which water drains into a stream, river, lake, or wetland.

Weed - A plant that is not wanted. In natural areas, weeds have the potential to cause damage in some way to native or endemic vegetation.

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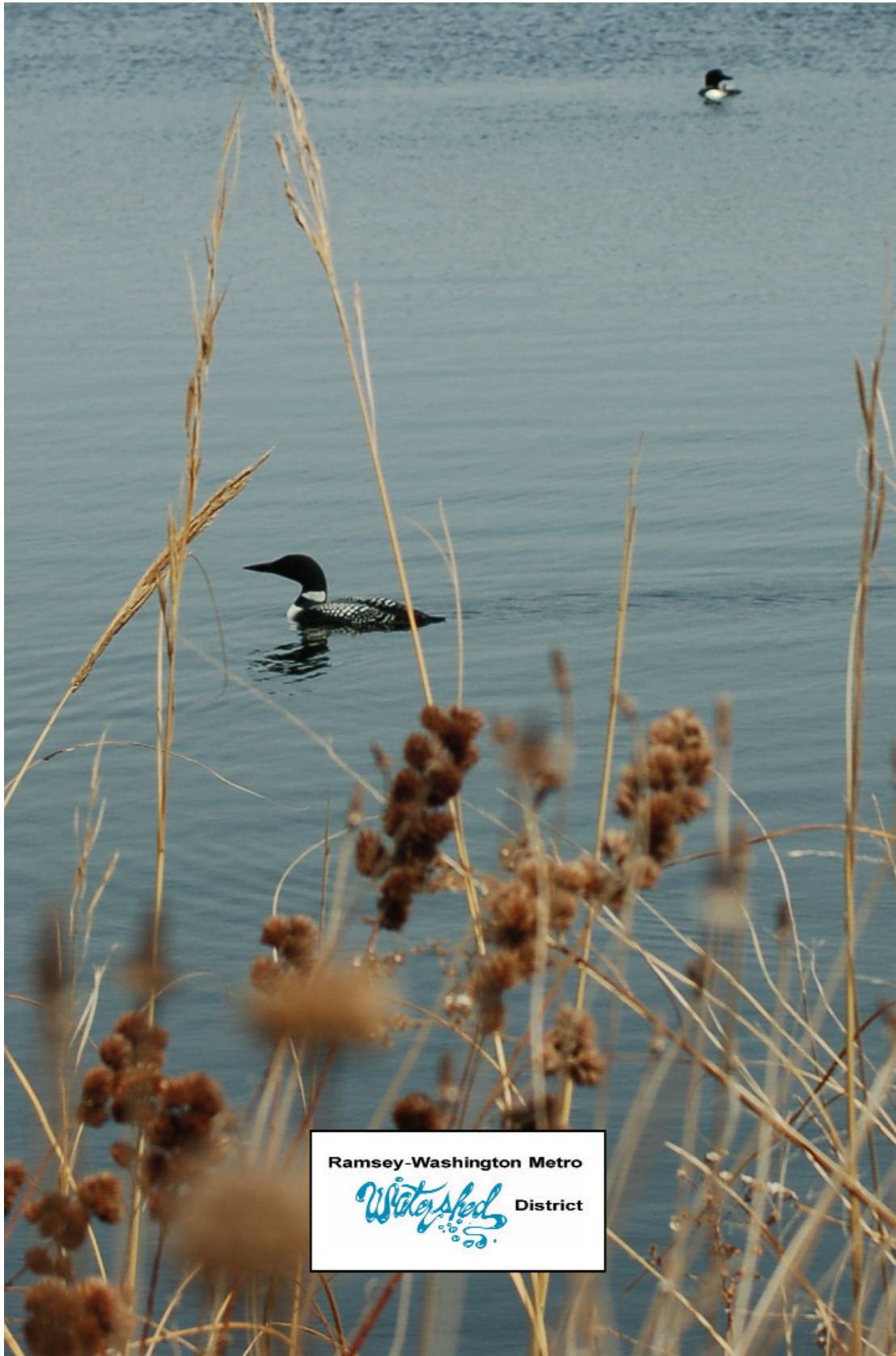
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