Native Plants for Sustainable Landscapes:

Establishment and Management of Lakeshores and Gardens

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Table of Contents

Sustainable Landscapes and Management

Native plants can be used around homes and in gardens to create sustainable landscapes. Most native plants are perennial and have extensive root systems that hold soil and slow runoff. Persistent stems, leaves, and flower parts which remain through the winter also reduce runoff, especially in the spring, as snow melts and rainfall begins before new growth is present. Particulate matter accumulates around these native plants and the plants themselves absorb chemicals such as nitrogen and phosphorous that would otherwise enter the runoff.

Native plants have many positive characteristics. Native plants used as buffer strips along water margins slow runoff and absorb nutrients. They are also self-sustaining, and they support wildlife including beneficial insects, pollinators, and native birds.

Successfully growing native plants requires an understanding of the evolutionary adaptations plants make to specific light and soil moisture conditions. Prairie plants have adapted to dry, sunny uplands, while woodland plants tolerate shade. Wet meadows contain plants species tolerant of sun and wet soils, while plant species in the emergent zone grow with their stems above water and their roots in water. Submerged or floating leaf plants have stems and leaves under water with some parts above water.

Once established, these landscapes can be managed by using principles of Integrated Pest Management, which emphasize lower pesticide usage. These sustainable landscapes require less chemical treatment, reducing the amount of chemicals put into the environment which have nontargeted effects on the ecosystem, its plants, and its animals.

This bulletin contains information on sustainable landscaping in watersheds, sustainable management of such landscapes, lists of vendors who sell native plants and erosion control materials, and an extensive list of recommended native plants. Landscapes and their management are described for drier upland gardens as well as shoreline buffer strips.

Traditional Landscapes
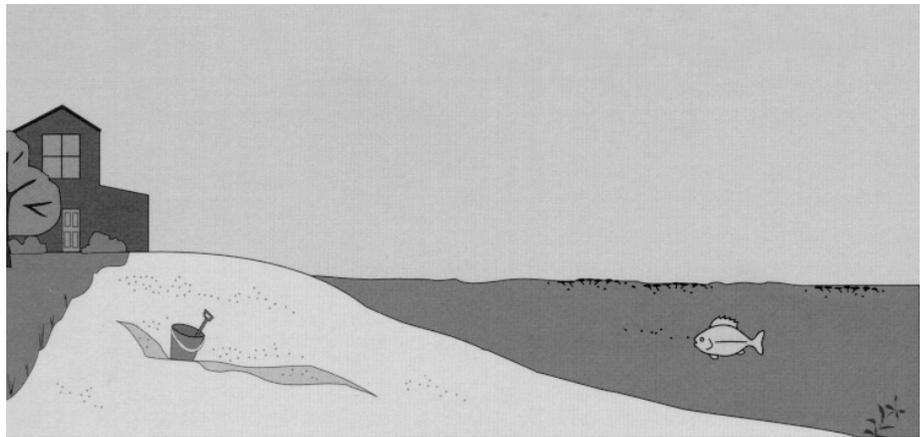
Sustainable Landscape
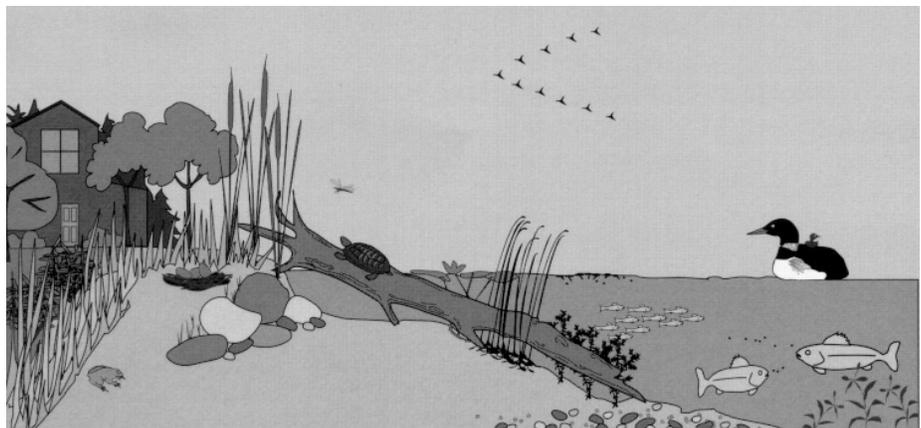
Convert upland gardens and shorelands to wildlife havens by planting native species and practicing sustainable management. (MNDNR). Copyright 1998, State of Minnesota, Department of Natural Resources, Section of Fisheries.

Benefits of Sustainable Landscapes

Sustainable Landscapes Protect Water Quality

• *Erosion is reduced.* Since upland plants hold soil and shoreline plants reduce wave and ice action, erosion is reduced and soil is less likely to erode into the water.

• *Runoff volume is reduced.* Upland landscapes and shoreline buffer strips slow down water so it soaks into the soil, rather than racing down to the lake.

• *Herbicides, pesticides, and fertilizers are reduced or eliminated from runoff.* Plants adapted to their environment often require fewer pesticide and fertilizer treatments.

• *Plant nutrients are removed from lake water.* Plants absorb nutrients which would otherwise increase the growth of water-clouding algae.

Sustainable Landscapes Increase Biodiversity

• *Increased numbers of plant and animal species help make a landscape sustainable*. A variety of plant species provide food and shelter for birds and beneficial insects which reduce insect pest outbreaks.

• *Fish habitat is enhanced with aquatic vegetation*. Emergent vegetation provides habitat for spawning fish and fry. Water quality improvements increase fish production.

• *Native plants and animals are conserved.* Many plants have become rare as their habitats have been converted to farms and towns. Native plants in home landscapes support a food web including birds, insects, and other animals.

Sustainable Landscapes Provide Social Benefits

• *Property values are increased.* Beautiful vistas from the home and water are created by the use of native plants. The variety of colors and plant forms, the energy and activity of birds and insects, and the seasonal changes of both plants and animals provide diversity and visual enjoyment. The house may be partly hidden by vegetation for greater privacy and a natural looking lakeshore. Trees and shrubs reduce noise of jet skis and boats. A landscaped lot adds value to the house.

• *Little maintenance is required on established landscape.* Initially, some weeding may be necessary. Once the plants have become established, there will be less time spent on mowing, planting of annual bedding plants, chemical spraying, and trips to the compost site with leaves and grass clippings. Less time, energy, and money is spent on maintenance and time is gained for backyard butterfly or bird watching, or other activities.

When designing a sustainable lakeside landscape, information is needed about the lot and adjacent lakeshore, including water runoff patterns, so that erosion can be prevented and water quality improved. Microhabitats must be identified so that suitable plants can be chosen and adequate numbers of plants can be grown or ordered. The ordinary high water level of the lake must also be determined since Minnesota Department of Natural Resources regulations apply to areas below this level. All this information can be organized and summarized into a plan based on your needs and preferred property uses. If desired, there are landscape design firms which can be hired to help develop plans.

The Minnesota Department of Natural Resources has an excellent book on landscaping, *Lakescaping for Wildlife and Water Quality,* by Carrol L. Henderson, Carolyn J. Dindorf, and Fred J. Rozumalski. Ordering information can be obtained from the Gift Shop (651-228-9165) or Minnesota's Bookstore (651-297-3000).

Planning to complement activities

Landscape to complement your activities. For example, if a large lawn is not needed, parts of an existing lawn can be replaced with ground covers, perennials or shrubs. Note areas where views may be enhanced or screened with vegetation. Do not disturb areas with natural vegetation. Plan to install bird feeders and bird houses and benches to sit on to enjoy the view.

Accessories in the landscape are signs of a cared for and well-managed property. These elements of care show neighbors that the property is not neglected, and they are especially valuable in unconventional landscapes.
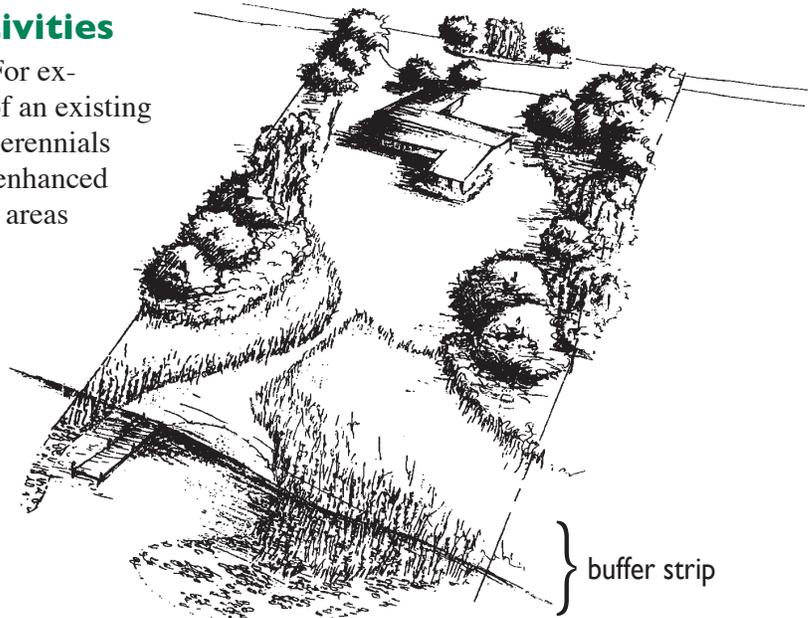
} buffer strip

Landscape plan with buffer strip. Used with permission of Fred Rozumalski, design and Roseanne Esparza, drawing.

Correcting and avoiding erosion problems

Storm water management needs attention since water carries soil into the lake and cuts gullies. If serious erosion problems are developing, seek the advice of your watershed district, or county extension specialists.

Some erosion can be reduced by proper landscaping. Tour your property during heavy rain to observe runoff patterns. Work with your natural topography, and keep water quality in mind.

Steep slopes need careful planting to control erosion. Gardens should not be located on steep slopes unless the area is terraced perpendicular to the slope. Paths on the shore from house to water line should run diagonally rather than straight down a hill. Eroded paths should be replaced with steps. Hard surfaces that allow water to run off should be replaced with porous surfaces such as gravel or mulch.

Selecting plants

Native plants are hardy, do not require fertilizer once established, and provide food and habitat for native animals. Most native species are perennial, and they also maintain themselves by reseeding on the same site. In contrast, popular bedding plants such as petunias and geraniums often provide little value for wildlife and must be replanted each year.

Though many exotic perennials can be adapted to local climates, they may not be as valuable in supporting beneficial insects such as predators, pollinators, and butterflies. Horticultural varieties of native plants, which could also be used, have been altered in ways that reduce their value as food to animals. For instance, double flowers provide little nectar to butterflies, bees, and beneficial insects.

It is also important to know that the use of some exotic plant species is illegal. Buckthorn and purple loosestrife, for example, are exotic plants that escaped from cultivation and have become serious pests in natural areas.

Identifying microhabitats or zones

Habitats within the landscape need to be identified based on light and moisture regimes so that proper plant species can be added to each such microhabitat. Dry, sunny locations support prairie vegetation, while areas under trees are preferred by shade-tolerant species. Places with wet soils support wet meadow vegetation. An emergent zone is an area of shallow water. And a submerged, floating leaf zone, supports plants that grow through the water column to the surface.

Table 1. A brief list of plants found in upland, wet meadow, emergent, and submerged zones.

Zone 1: upland (prairie or woodland)

Trees
bur oak	*Quercus macrocarpa*
common chokecherry	*Prunus virginiana*
red maple	*Acer rubrum*
red oak	*Quercus rubra*
white oak	*Quercus alba*
wild plum	*Prunus americana*

Shrubs
American elderberry	*Sambucus canadensis*
American highbush cranberry	*Viburnum trilobum*

Prairie grasses for sun
big bluestem	*Andropogon gerardii*
Indian grass	*Sorghastrum nutans*
little bluestem	*Schizachyrium scoparium*
sideoats grama	*Bouteloua curtipendula*

Herbaceous plants for sun
anise hyssop	*Agastache foeniculum*
bergamot	*Monarda fistulosa*
butterfly milkweed	*Asclepias tuberosa*
Culver's root	*Veronicastrum virginicum*
gray-head coneflower	*Ratibida pinnata*
prairie blazing star	*Liatris pycnostachya*
prairie smoke	*Geum triflorum*
purple coneflower	*Echinacea augustifolia*
purple prairie clover	*Dalea purpurea*
thimbleweed	*Anemone cylindrica*

Herbaceous plants for woodland shade
Canada wild ginger	*Asarum canadadense*
common blue violet	*Viola papilionacea*
Jacob's ladder	*Polemonium reptans*
mayapple	*Podophyllum peltatum*
true Solomon's seal	*Polygonatum biflorum*
wild geranium	*Geranium maculatum*

Zone 2: wet prairie soils (wet meadow)

Trees
black spruce	*Picea mariana*
cottonwood	*Populus deltoides*
Saskatoon	*Amelanchier alnifolia*
red maple	*Acer rubrum*
swamp white oak	*Quercus bicolor*

Shrubs
buttonbush	*Cephalanthus occidentalis*
meadowsweet	*Spirea alba*
pussy willow	*Salix discolor*
red osier dogwood	*Cornus sericea*

Grass
prairie cord grass	*Spartina pectinata*

Herbaceous plants (and others)
blue flag iris	*Iris versicolor*
blue vervain	*Verbena hastata*
bottlebrush sedge	*Carex comosa*
cardinal flower	*Lobelia cardinalis*
Culver's root	*Veronicastrum virginicum*
great blue lobelia	*Lobelia siphilitica*
Joe-pye weed	*Eupatorium maculatum*
marsh marigold	*Caltha palustris*
spike rush	*Eleocharis species*
swamp milkweed	*Asclepias incarnata*

Zone 3: emergent lake margins

Herbaceous plants (and others)
arrowhead	*Sagittaria latifolia*
bur-reed	*Sparganium americanum*
Canada bluejoint grass	*Calamgrostis canadensis*
cattail	*Typha latifolia*
green bulrush	*Scirpus atrovirens*
lake sedge	*Carex lacustris*
pickerelweed	*Pontederia cordata*
river bulrush	*Scirpus fluviatilis*
soft rush	*Juncus effusus*
water plaintain	*Alisma plantago-aquatica*
wool grass	*Scirpus cyperinus*

Zone 4: submerged or floating leaf (for wet soils always under water)
American lotus	*Nelumbo lutea*
spatterdock	*Nuphar advena*
white waterlily	*Nymphaea odorata*
wild celery	*Valisneria americana*

Four specific zones are defined:

- Zone 1: prairie if sunny, or woodland if shady
- Zone 2: wet meadow, wet soil
- Zone 3: emergent, shallow water
- Zone 4: submerged, aquatic, with soil that is never exposed

Plants must be selected which are suitable for a location, and suitability is based on actual observations of soil moisture and sun or shade conditions. Some recommended species are listed in Table 1 and Table 2. A more comprehensive and extensive native plant list begins on page 13.

Trees and shrubs can provide shade, frame your view, and hold soils on steep slopes. Grasses, sedges and flowering perennials can be used where an unobscured view is important.

Identifying the lake boundary

You need to locate the ordinary high water level of any body of water where you seek to landscape a shoreline. This is considered to be the highest water level that the lake has maintained for enough time to leave evidence on the landscape.

The high water level is considered to be the legal boundary of the lake bed. It is often the highest point reached by emergent plant species such as sedges, rushes, and cattails. The Minnesota Department of Natural Resources has jurisdiction over all areas below that ordinary high water level. A permit from the DNR is required to remove or add any plants in this area. Plantings above the ordinary high water level are subject to local ordinances, if any exist.

Using a buffer strip of vegetation

Buffer strips are natural unmowed areas between the water's edge and a lawn or hard surface such as a driveway or patio. Runoff will pass through the buffer strip to reach the water, but its speed will be reduced and much of the sediment it carries will be captured by the buffer strip.

A buffer strip should be at least 30 feet deep, reaching up the slope from the water's edge and extending as far as possible along the shoreline. For example, if you have 100 feet of shoreline, you should reserve 25 feet or less of shoreline for lake access, and convert the remainder to buffer. Wider buffer strips will be even more beneficial. Even simply leaving a strip unmowed will allow the growth of taller and denser plants which will slow down runoff and intercept sediment.

The use of native plants will make buffer strips more attractive and increase the area's biodiversity. The most effective buffer strips consist of vegetation with dense root systems and many erect stems which persist through fall and spring rains. Multiple layers of trees and shrubs are most effective against soil erosion on steep slopes.

dock

wavebreak

erosion fencing

newly planted and mulched areas

Buffer strips along lake margins have also been demonstrated to reduce access by geese to lawns. The University of Minnesota's Department of Fish and Wildlife website has more information on this subject (www.fw.umn.edu/extension/indept.html).
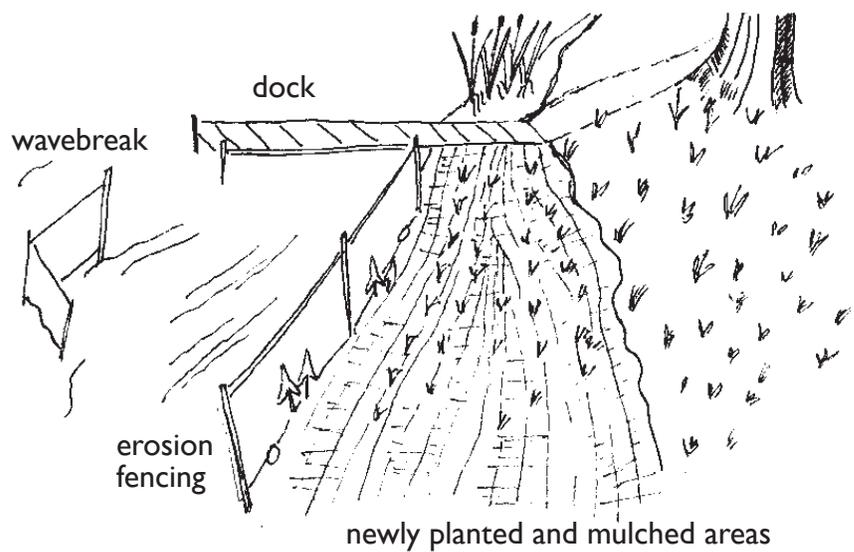
Table 2. Some common native plants.

Solidago species goldenrod prairie	Aster Novae-anglia New England aster prairie	Ratabida pinnata gray-headed coneflower prairie	Veronicastrum virginicum Culver's root prairie	Liatris species blazing star prairie
Monarda fistulosa wild bergamot prairie	Andropogon gerardii big bluestem prairie	Verononia fasciculata ironweed prairie	Iris versicolor blue flag iris wet meadow	Lobelia cardinalis cardinal flower wet meadow
Carex comosa bottlebrush sedge wet meadow	Pontederia cordata pickerel weed emergent	Sparganium americanum bur-reed emergent	Alisma plantago-aquatica water plantain emergent	Sagitaria latifolia arrowhead emergent
Typha latifolia cattail emergent	Nymphaea odorata white waterlily submergent	Valisneria americana wild celery submergent/floating leaf	Nelumbo lutea American lotus (protected specie) submergent/floating leaf	
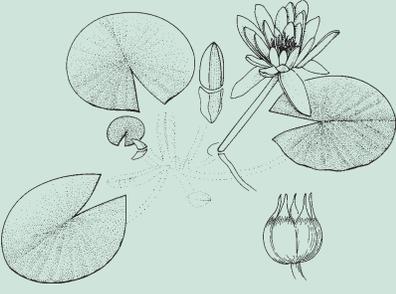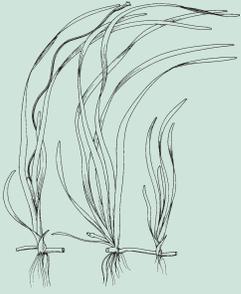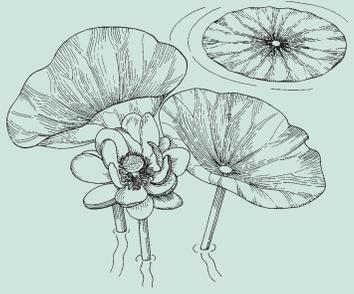
Implementing a Landscape Plan

Obtaining plants and seeds

As native plant landscaping increases in popularity, more nurseries are propagating and selling native plants locally and by mail. It is best to buy plants that are propagated from plants native to Minnesota since they are better adapted to our region. Although it may be tempting, do not remove plants from the wild unless you have a permit.

Plants can be raised from seed. Seeds may be purchased from suppliers, or collected on private property with the landowner's permission, as long as this can be done without harming wild populations. Seeds from endangered, threatened, or special-concern species must not be collected, and these species are not included on the plant lists in this publication.

Most seeds of native plants require a cold treatment before they will germinate. You will likely need to mix the seeds with damp sand and refrigerate them for two months. Alternatively, seeds can be planted in pots in the fall, covered with mulch, and left outdoors for the entire winter in a protected, shaded spot, or in an unheated garage. Uncover the pots in the spring and keep them watered.

Planting prairie, woodland and wet meadow

Remove existing vegetation before planting to increase success. Roots of existing plants can otherwise compete with tender young roots of newly planted vegetation.

Sod and weeds can be removed by hand, by rototilling, or by covering them with plywood and/or black plastic sheets for two months or more. In areas that are rototilled, care must be taken to prevent erosion and reduce runoff. Alternatively, herbicides can be used, but care must be taken to prevent herbicides from entering the water. If herbicides have been used, wait two weeks before planting.

Native Plants

In the Twin Cities area, native vegetation included oak savanna on the uplands with wet prairie grading into wetlands in the valleys. The native plants supported animals and people. Many plants were used in historic times as foods, medicines, dye plants, building materials and craft materials. We can preserve our native plants by using them in landscapes and in large scale revegetation projects.

Areas which are overgrown with reed canary grass or purple loosestrife are particularly difficult to plant due to the intense competition from these weeds. These plants may be removed mechanically or with the use of herbicides.

It is best to plant on a drizzly or overcast day. You can improve the success of your planting by:

- not allowing the plants to dry out before planting
- providing ample room in each planting hole
- not planting too deeply; keeping the plant at the same level it had in the pot
- protecting the plants from strong winds
- mulching before planting, which is much faster than mulching after planting
- watering immediately, then daily for two weeks
- continuing to water new plants until they are well established

For spacing, one plant per square foot is recommended, but denser plantings will cover the ground faster, especially on slopes. Most plants grow slowly at first as they develop roots, so small transplants yield more rapid results than direct seeding. Three years may be needed for some plants to mature.

Direct seeding of prairie and wet meadow plants may be used to cover large areas. Spring and fall are the best times for seeding in Minnesota. You can broadcast seed by hand or use a spreader on prepared soil. Ensure good seed-to-soil contact by lightly raking the seed in, then rolling with a lawn roller. Cover the seeded area with a light mulch of weed-free straw.

Planting the emergent and submerged zone

All aquatic areas of lakes and areas below the ordinary high water level are regulated by the Minnesota Department of Natural Resources. A permit is required to plant or remove vegetation, to use herbicides, and to install wavebreak structures.

Even with a permit, you need to be aware that revegetation in the emergent and submerged zones is not as well researched as are prairie plantings. Extra care must be taken to prevent sediment from entering water by placing straw bales or filter fences between the planting area and water.

Undesired vegetation in the emergent zone can be removed by hand or by heavy mulching with plywood or black plastic left in place for two months before planting. Wetland soils should not be tilled. Herbicide use is not recommended and requires DNR approval.

Areas with heavy wave action, whether natural or due to boat traffic, may require wavebreaks such as brush bundles, coconut fiber logs, or plywood held in place with a PVC frame for a period of time so that plants will not be washed away before they take root. Plants can be planted directly into coconut fiber logs or biodegradable erosion mats, and a list of possible suppliers is provided on page 18 of this publication.

Permits

To plant or remove aquatic vegetation, contact the Minnesota Department of Natural Resources office nearest you, or the Ecological Services Section, Minnesota DNR, 500 Lafayette Road, St. Paul, MN 55155, or call 651-296-2835 (in the Minneapolis-Saint Paul metropolitan area) or 1-888-646-6367. You can also visit their homepage (www.dnr.state.mn.us/waters/shoreland) for more information, or contact the University of Minnesota Extension Service at 612-625-8173 to obtain the bulletin, Managing Aquatic Plants in Minnesota Lakes (FO-6955-C).

Remember that different bottom sediments influence wave action. Area with sandy bottoms often have higher wave action, which could be reduced if aquatic plants colonize the area.

In the emergent and submerged zones, using plants, rhizomes (underground stems with buds) or tubers, rather than seeds, is recommended. Seeds of most emergent plants will not germinate under water, so unless the water level can be controlled, you must wait for a dry period to plant them.

Plants for emergent and submerged zones should also be planted as soon as possible after you receive them, and should be kept cool and moist until they are planted. Emergent plants must have some of their leaves above the water in order to start growth, although they may spread into deeper waters later. Do not clip or prune them. Tubers of arrowhead, bulrushes, and waterlillies need to be planted by pushing the tubers firmly into the mud or sand.

Plants, tubers, and rootstocks may be held in place by staking them down, tying them to bricks using cotton string, or placing them in cheesecloth bags weighted with rocks. Some suppliers sell tubers, rhizomes, or plants with weights attached. These can be dropped directly into the water in areas protected from wave action. As roots develop, plants will be held in place naturally.

Maintaining the Sustainable Landscape

Long-term sustainable management

Watering may be necessary during the first season of a new planting, even in areas close to a lake. In general, native plants will gradually out-compete any weeds present, but it is best to remove as many weeds as possible by hand before they develop deep roots.

Once established, prairie restorations may be mowed or burned in fall or spring to prevent invasion of trees and exotic grasses, but burning requires a permit and you must check both local ordinances and with the Minnesota Department of Natural Resources. Do not burn for the first three years after planting. Once the restoration is well established, burning every three years will maintain it. In urban areas where burning is prohibited, mowing in early spring can partly mimic fire conditions.

Components of sustainable management

There are four primary components to sustainable management: placing plants in their correct micro-habitats, using low input lawn care, composting, and applying integrated pest management practices.

Use plants suitable to the microhabitat – Every site contains different microhabitats due to light and moisture differences. The use of perennial plants, especially natives, which are adapted to each micro-habitat, reduces the need for fertilizers, herbicides, and pesticides. Replanting is typically not necessary since these plants persist for many years.

Low input lawn care – Limit lawn fertilization to low-phosphorus fertilizer applications in August and September. Water the fertilizer lightly into the soil or vegetation. Do not allow fertilizer to enter the water as it will increase the growth of algae and aquatic plants.

Longer grass survives better in the shade and during hot dry weather. Weeds are slower to invade longer grass, so mow to a height of $3\frac{1}{2}$ inches. If grass is tall, only take about one-third off the height at a time until the $3\frac{1}{2}$-inch maintenance level is reached. Leave grass clippings on the lawn, but keep them out of the water.

Remove weeds by hand rather than applying herbicide. In the shade, instead of grass use shade-tolerant species of ground cover.

Composting – Compost yard wastes and add the compost to gardens to improve soil structure, hold moisture, and provide a low level of nutrients. Purchased mulch retains water, but does not provide the same soil structure benefits as compost. Leave twigs, leaves and other litter on the ground under trees, but not on lawns. Stems and branches will slow the rate of runoff during spring snowmelt.

Integrated Pest Management (IPM) – When pest problems develop, control is best accomplished by Integrated Pest Management. IPM is a decision-based management system based on timing pesticide applications when insect pests are in earlier stages and most vulnerable. Biorational pesticides such as soaps, horticultural oils, *Bacillus thuringiensis* (Bt) bacteria, and *Beauveria* fungus are favored over conventional pesticides. These biorationals conserve beneficial insects such as predators and parasitoids.

Conventional pesticides should be used on a limited basis only when necessary, to avoid killing beneficial insects. Beneficial insects are predators, parasitoids, bees, and butterflies. Predators and parasitoids reduce pest insects. Bees and butterflies pollinate plants and add beauty to the landscape. Table 3 on the next page shows some examples of beneficial insects that utilize native plants.

Table 3. Some examples of common beneficial insects: predators, parasitoids and pollinators.

Odonata: adult dragonfly, predator	Odonata: aquatic nymph dragonfly, predator
Coleoptera: ground beetle, predator (eating a caterpillar)	Neuroptera: larval lacewing, predator
Hymenoptera: adult parasitic wasp, parasitoid	Hymenoptera: adult parasitic wasp, parasitoid (laying egg in an aphid)
Lepidoptera: swallowtail butterfly, pollinator	Lepidoptera: sphinx moth, pollinator (on a Michigan lily)
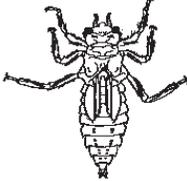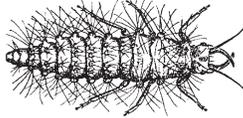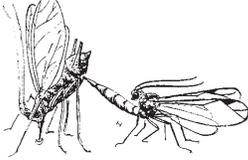
Appreciating the Sustainable Landscape

Over the long term, less maintenance will be required as a sustainable landscape of native plants continues to develop. You can chronicle the growth and evolution of your landscape, and the progress of plant and animal populations, by taking photos and recording observations of the site after planting, and then regularly for several years. Some plant species will thrive and others will prove unsuited to the site and vanish. Birds and insects will arrive and leave as the seasons change.

Always be aware of changes that may cause erosion and be ready to prevent them. Sustainable landscaping with native plants will enhance your enjoyment of your property and increase its value for years to come.

Native Plant List

Most of the plants listed are perennials. Forbs are herbaceous perennials. Shrubs are woody, usually less than 20 feet tall with multiple trunks. Trees are taller and usually do not form thickets. Wildlife value includes any special features of the plant which supply food or improve the habitat for birds, mammals, and beneficial insects such as parasitoids, predators and butterflies.

Zones
zone 1 upland areas, prairie, dry, sun or woodland, shade
zone 2 wet meadow, wet soil
zone 3 emergent, lake margin, shallow water
zone 4 submerged or floating leaf, aquatic

Light requirements (Sun)
○ = full sun, ◗ = part shade, ● = shade

Growth form
fern, forb (herbaceous perennial), grass, rush, sedge, shrub, tree

Easy to grow?
y = yes

Height
maximum height in feet

prairie and woodland   wet meadow   emergent   submerged or floating leaf

Common name	Species name	Zone	Sun	Growth	Easy?	Height	Wildlife Values	Other
maidenhair fern	Adiantum pedatum	1	●	fern		2		
ostrich fern	Matteuccia pensylvanica	1	●	fern		5		
sensitive fern	Onoclea sensibilis	1	◗	fern	y	3		
interrupted fern	Osmunda claytoniana	1	◗	fern		4		interesting leaves
yarrow	Achillea millefolium	1	○	forb		2	butterfly	may be weedy, medicinal, small white flowers
anise hyssop	Agastache foeniculum	1	○ to ◗	forb	y	3	bee, butterfly	blue flowers, long-blooming, licorice-scented leaves
prairie onion	Allium stellatum	1	○	forb		2		white or pink flowers, slender leaves
lead plant	Amorpha canescens	1	○	forb	y	3	bee, butterfly	purple flowers during the buffalo mating season
thimbleweed	Anemone cylindrica	1	○ to ◗	forb	y	2		white flowers in mid-spring
pasqueflower	Anemone patens (Pulsatilla nutalliana)	1	○	forb		0.5	bee	signal for spring celebrations among the Dakota, mature plants difficult to transplant
wild columbine	Aquilegia canadensis	1	○ to ◗	forb		2	bee, butterfly, hummingbird	red and yellow flowers with long spurs, self-sows
Canada wild ginger	Asarum canadense	1	◗ to ●	forb	y	0.5		ground cover, roots taste like ginger, strange brownish-red flowers
butterfly milkweed	Asclepias tuberosa	1	○ to ◗	forb		3	butterfly	bright orange flowers, roots once used medicinally
heath aster	Aster ericoides	1	○	forb		2	bee, butterfly	small white flowers in late fall, heather-like leaves
calico aster	Aster lateriflorus	1	◗ to ●	forb		4		blossoms once used to treat insanity
New England aster	Aster novae-angliae	1	○ to ◗	forb		4		spreads rapidly, purple flowers in late summer, cut flower
sky-blue aster	Aster oolentangiensis	1	○ to ◗	forb		2.5	bee, butterfly	blue flowers in early fall

Common name	Species name	Zone	Sun	Growth	Easy?	Height	Wildlife Values	Other
silky aster	Aster sericeus	1	○	forb		1.5	bee, butterfly	purple flowers, silky gray-green leaves, once used to treat arthritis
blue false indigo	Baptisia australis	1	○ to ◑	forb		3	bee	blue flowers
golden asters	Chrysopsis villosa (Heterotheca villosa)	1	○	forb		2		yellow aster-like flowers
coreopsis	Coreopsis palmata	1	○	forb		3		yellow flowers, short-lived but self-sows
white prairie clover	Dalea candida (Petalostemum candidum)	1	○	forb		3	butterfly	
purple prairie clover	Dalea purpurea (Petalostemum purpureum)	1	○	forb		3	terrific bee and butterfly plant	little purple flowers with orange pollen, leaves fragrant when crushed
showy tick-trefoil	Desmodium canadense	1	○ to ◑	forb	y	5		pink flowers
dutchman's breeches	Dicentra cucullaria	1	◑	forb		0.5		leaves die back in summer
shooting star	Dodecatheon media	1	○ to ◑	forb		1		early to bloom, slow to germinate, leaves die back in summer
purple coneflower	Echinacea purpurea	1	○ to ◑	forb	y	4	butterfly	root once used for toothache, now thought to stimulate immune system
boneset	Eupatorium perfoliatum	1	○ to ◑	forb	y	3	bee, butterfly	cut flower
queen-of-the-prairie	Filipendula rubra	1	○	forb		6		fluffy bright pink flowers, spreads rapidly, once used as a love potion
bottle gentian	Gentiana andrewsii	1	○	forb		2	bumblebee	blue flowers, seeds are slow to germinate
wild geranium	Geranium maculatum	1	◑	forb	y	2		pink flowers, spreads but is not invasive
prairie smoke	Geum triflorum	1	○	forb	y	1		early red flowers followed by fluffy seedhead "smoke," groundcover
showy sunflower	Helianthus laetiflorus	1	○	forb	y	4	bee, butterfly, bird	self-sows, cut flower
ox-eye	Heliopsis helianthoides	1	○	forb	y	3	butterfly	yellow flowers, cut flower, long blooming season
round-headed bush clover	Lespedeza capitata	1	○	forb		4	bee, seeds eaten by bird	
blazing star	Liatris species	1	○ to ◑	forb		4	bee, butterfly, bird	pink spikes, cut flower, once fed to horses to make them run faster
Michigan lily	Lilium michiganense	1	○ to ◑	forb		4		orange flowers, bulbs are edible
wild lupine	Lupinus perennis	1	○	forb		2	bee	showy blue flowers in spikes, early-bloomers, self-sows
Virginia bluebells	Mertensia virginica	1	○ to ◑	forb	y	2		blue flowers, plants die back after blooming
wild bergamot; beebalm	Monarda fistulosa	1	○ to ◑	forb	y	2	bumblebee, butterfly	lavender flowers, leaves used to make tea, leaves tend to mildew
large-flowered beardtongue	Penstemon grandiflorus	1	○ to ◑	forb		2	bumblebee, hummingbird	early showy pink flowers, will not tolerate competition
mayapple	Podophyllum peltatum	1	◑	forb		1		spreading ground cover, white flowers, edible fruits
Jacob's ladder	Polemonium reptans	1	○ to ◑	forb	y	1		blue flowers
true Solomon's seal	Polygonatum biflorum	1	◑	forb		4		green flowers, blue berries, roots used medicinally
mountain mint	Pycnanthemum virginianum	1	○ to ◑	forb		1.5		fragrant when crushed, white flowers
gray-headed coneflower	Ratibida pinnata	1	○	forb	y	3	bee, butterfly	yellow flowers
black-eyed Susan	Rudbeckia hirta	1	○	forb	y	2	bee, butterfly	yellow flowers with black center
bloodroot	Sanguinaria canadensis	1	● to ◑	forb		1		white flowers are short-lived, groundcover, red dye from rhizomes

Common name	Species name	Zone	Sun	Growth	Easy?	Height	Wildlife Values	Other
compass plant	Silphium laciniatum	1	○	forb		6	bee, butterfly, bird	yellow flowers, deeply cut leaves
cup-plant	Silphium perfoliatum	1	○ to ◗	forb		6	bee, butterfly	shaggy yellow flowers, prairie moths bore into stems, roots used medicinally
false Solomon's seal	Smilacina racemosa	1	◗	forb	y	3		white flowers followed by red berries
gray goldenrod	Solidago nemoralis	1	○ to ◗	forb		2	bee, butterfly	yellow flowers in late summer, graceful form
showy goldenrod	Solidago speciosa	1	○ to ◗	forb		4	bee, butterfly	yellow flowers in spikes
spiderwort	Tradescantia ohiensis	1	○ to ◗	forb		1		pink or purple flowers liquefy by noon, once used as a cure for spider bites
bellwort	Uvularia grandiflora	1	◗ to ●	forb	y	1		nodding yellow flowers in early spring, pioneers used early shoots for greens
blue vervain	Verbena hastata	1	○ to ◗	forb		4	bee, butterfly	blue flowers in spikes
hoary vervain	Verbena stricta	1	○ to ◗	forb	y	4	cover	purple flowers in spikes, tolerant of disturbance
Culver's root	Veronicastrum virginicum	1	○ to ◗	forb		6	bee, butterfly	white flowers in spikes, cut flower
common blue violet	Viola papilionacea	1	○ to ◗	forb	y	0.5	wild turkey eat the roots	groundcover, may be invasive
bird's-foot violet	Viola pedata	1	○	forb		0.5	butterfly	purple flowers in early spring, not a good competitor, leaves are food for caterpillars
golden alexanders	Zizia aurea	1	○	forb	y	2.5		yellow flowers in spring, glossy leaves
big bluestem	Andropogon gerardii	1	○	grass	y	8	cover, seeds	king of native grasses, red-brown in winter, leaves once applied to infected wounds
sideoats grama	Bouteloua curtipendula	1	○	grass		2	cover, seeds	
switchgrass	Panicum virgatum	1	○	grass		5	cover, seeds	golden or reddish in fall
little bluestem	Schizachyrium scoparium/ Andropogon scoparius	1	○	grass		3	cover, seeds	reddish purple winter color
Indian grass	Sorgastrum nutans	1	○	grass	y	6	cover, seeds	
New Jersey tea	Ceanothus americanus	1	○ to ◗	shrub		3	bee, butterfly	white flowers in June and July, leaves once used as tea
American hazelnut	Corylus americana	1	○	shrub		9	nuts	
wild plum	Prunus americana	1	○ to ◗	shrub	y	20	bee, berries	fragrant white flowers, use fruit for jam
common chokecherry	Prunus virginiana	1	○ to ●	shrub	y	20	berries	fragrant white flowers, use berries for jam
smooth sumac	Rhus glabra	1	○	shrub	y	9		fall color, plant on steep slopes to prevent erosion
wild rose	Rosa arkansana	1	○	shrub	y	3	winter food for birds	pink flowers, red hips containing vitamin C, spreads by suckers
American elderberry	Sambucus canadensis	1	○ to ◗	shrub	y	9	berries	fragrant white flowers, use purple berries for jam or in muffins
American highbush cranberry	Viburnum trilobum	1	○ to ◗	shrub		12	berries	white flowers, leaves turn red in fall, red berries persist through winter
climbing prairie rose	Rosa setigera	1	○	shrub or vine		6	bee, butterfly winter food for birds	pink flowers, red hips
white oak	Quercus alba	1	○	tree		60	acorns, nesting sites	best fall color of the oaks, plant acorns as soon as they fall
bur oak	Quercus macrocarpa	1	○	tree		60	acorns, nesting sites	fine shape
red oak	Quercus rubra	1	○	tree		75	acorns, nesting sites	susceptible to oak wilt
black locust	Robinia pseudoacacia	1	○	tree		60	bee	fragrant white flowers

Common name	Species name	Zone	Sun	Growth	Easy?	Height	Wildlife Values	Other
mountain ash	Sorbus americanus	1	○ to ◗	tree		30	berries	white flowers, orange berries, the rowan tree of Celtic mythology
basswood	Tilia americana	1	○ to ◗	tree	y	120		tiny green fragrant flowers, inner bark used to make rope
Jack-in-the-pulpit	Arisaema triphyllum	1,2	○ to ◗	forb		1.5		distinctive green flowers and red berries, tubers are edible but must be cooked
wild white indigo	Baptisia alba (lactea)	1,2	○ to ◗	forb	y	2	bee	white flowers on spikes, once used for blue dye
turtlehead	Chelone glabra	1,2	○ to ◗	forb		2	bee, butterfly	white or pink flowers
Joe pye weed	Eupatorium maculatum	1,2	○ to ◗	forb		5	bee, butterfly	fragrant fuzzy pink flowers, Joe Pye was a Native American herbalist
prairie cord grass	Spartina pectinata	1,2	○	grass		4	cover, muskrat eat roots	burned as fuel during the "Long Winter" (Laura Ingalls Wilder)
bottlebrush sedge	Carex comosa	2,3	○	sedge		4	cover	
red maple	Acer rubrum	1,2	○	tree		45	nesting sites	red or yellow leaves in fall
blue flag	Iris versicolor	2,3	○	forb		3	bee, butterfly, cover	blue or lavender flowers
swamp white oak	Quercus bicolor	1,2	○ to ◗	tree		60	acorns	tolerates wet soils, acorns once eaten by Native Americans
jewelweed	Impatiens capensis	2	◗	annual forb	y	4	bee	orange flowers, seed pods pop open, juice relieves itching
crested fern	Dryopteris cristata	2	●	fern		2	butterfly, wild turkey eat the roots	
royal fern	Osmunda regalis	2	○ to ◗	fern		5		young fiddleheads are edible
marsh fern	Thelypteris palustris	2	◗	fern		2		
swamp milkweed	Asclepias incarnata	2	○ to ◗	forb		4	bee, butterfly	rose to pink flowers, cut flower, edible flowers, roots used medicinally
scouring rush	Equisetum hyemale	2	○ to ◗	forb		3		best in sandy soils, a primitive plant from the age of dinosaurs
purple avens	Geum rivale	2	○	forb		1.5		
sneezeweed	Helenium autumnale	2	○	forb		4		cut flower
cardinal flower	Lobelia cardinalis	2	○ to ◗	forb		4	butterfly, hummingbird	bright red flowers, roots used as love charm
great blue lobelia	Lobelia syphilitica	2	○ to ◗	forb		3	bee, butterfly	blue flowers in spikes, used medicinally
fringed loosestrife	Lysimachia ciliata	2	○	forb	y	3	bee, butterfly	small green flowers with cut leaves, roots may contain an anti-cancer drug
tall meadowrue	Thalictrum dasycarpum	2	○ to ◗	forb	y	4		
prairie ironweed	Vernonia fasciculata	2	○	forb	y	5	bee, butterfly	pink flowers in late summer, cut flower
swamp saxifrage	Saxifraga pensylvanica	2	○	sedge		3		green flowers in spike
smooth alder	Alnus rugosa	2	○ to ◗	shrub	y	25		
Saskatoon	Amelanchier alnifolia	2	○ to ◗	shrub	y	20	birds love the fruit	white flowers
meadowsweet	Spirea alba	2	○	shrub		6	bee, butterfly	showy white flowers, cut flower
black ash	Fraxinus nigra	2	○ to ◗	tree	y	75	seeds	pleasant aroma
black spruce	Picea mariana	2	○	tree	y	45	dense cover for nesting bird	prefers acid soil
cottonwood	Populus deltoides	2	○	tree	y	50		yellow in fall
black willow	Salix nigra	2	○ to ◗	tree	y	60	bee, butterfly	
northern white cedar	Thuja occidentalis	2	○	tree	y	30	dense cover for nesting birds, winter cover	
sweet flag	Acorus calamus	2	○	forb		6		rhizomes have sweet fragrance when cut or bruised

Common name	Species name	Zone	Sun	Growth	Easy?	Height	Wildlife Values	Other
marsh marigold	Caltha palustris	2	○	forb		1.5		shiny yellow flowers in May, foliage dies back in summer
spike rush	Eleocharis species	2,3	○	rush		1.5	cover	
soft rush	Juncus effusus	2,3	○	rush		3.5	cover, muskrat eat roots	
rice cutgrass	Leersia oryzoides	2,3	○	grass		3		
pickerelweed	Pontederia cordata	2,3	○	forb	y	3		deep blue flowers in spikes
arrowhead	Sagittaria latifoia	2,3	○	forb	y	3	cover, food	
hard-stem bulrush	Scirpus acutus	2,3	○	rush		8	cover, food	
Canada bluejoint grass	Calamagrostis canadensis	2,3	○	grass		4	cover, food	stands up well in water
giant manna grass	Glyceria grandis	2,3	○	grass		5	cover	
lake sedge	Carex lacustris	2,3	○	sedge		3	cover, food	
tussock sedge	Carex stricta	2,3	○	sedge		2	cover	forms hummocks
green bulrush	Scirpus atrovirens	2,3	○	rush	y	4	cover	
wool grass	Scirpus cyperinus	2,3	○	rush		5	cover, food	fuzzy nutlets
river bulrush	Scirpus fluviatilis	2,3	○	rush		6	cover, food for muskrat	
black chokeberry	Aronia melanocarpa	2,3	○	shrub		9	berries	white flowers in June followed by black fruits, glossy leaves
buttonbush	Cephahanthus occidentalis	2,3	○ to ◗	shrub		9	butterfly	
red osier dogwood	Cornus sericea (stolonifera)	2,3	○ to ◗	shrub	y	18	berries	red stems add winter color, twigs used to make baskets
marsh cinquefoil	Potentilla palustris	2,3	○ to ◗	shrubby		1.5		red or purple flowers
pussy willow	Salix discolor	2,3	○ to ◗	shrub		20	bee	fuzzy catkins are a sign of spring, cuttings can be rooted
water plantain	Alisma plantago-aquatica	3	○	forb	y	2.5		
bur-reed	Sparganium americanum	3	○ to ◗	forb		5	duck, muskrat	poor germination from seed
cattail	Typha latifolia	3		forb				
American lotus	Nelumbo lutea	4	○	forb		floating	food	yellow flowers, need a rich muddy bottom, rhizomes and seeds were Native American foods
water celery	Valisneria americana	4		forb				cup-shaped yellow flowers, plant the rhizomes in mud, rhizomes are edible
spatterdock	Nuphar advena	4	○	forb		floating	food for muskrat, deer, beaver, moose and porcupine	
white waterlily	Nymphaea odorata	4	○	forb		floating	food	pure white fragrant flowers, plant rhizomes in fall in fertile mud

Sources of Native Seeds and Plants

[prairie plants]
Booming Native Plants, 2323 County Road 6, Barnum MN 55707-8748

[trees]
Itasca Greenhouse Inc., P.O. Box 273, Cohasset MN 55721; 800-538-8733

[aquatics and emergents]
J and J Tranzplant Aquatic Nursery, P.O. Box 227, Wild Rose WI 54984-0227; 715-256-0059

[prairie and woodland perennials and grasses]
Landscape Alternatives Inc., 1705 St. Albans Street, Roseville MN 55113; 651-488-3142

[wildflowers, sedges, grasses, and rushes]
Morning Sky Greenery, Route 1, Box 137, Hancock MN 56244; 320-392-5282

[trees]
Out Back Nursery Inc., 15280 110th Street South, Hastings MN 55033; 651-438-3816

[prairie and woodland perennials and trees]
Prairie Moon Nursery, Route 3, Box 163, Winona MN 55987; 507-452-1362, fax 507-454-5238
http://www.prairiemoonnursery.com

[prairie perennials and grasses]
Prairie Restorations Inc., P.O. Box 327, Princeton MN 55371; 612-389-5733
http://www.prairieresto.com

[prairie, woodland and wetland perennials]
Prairie Ridge Nursery, 9738 Overland Road, Mount Horeb WI 53574-2832; 608-437-5245

[prairie grasses and perennials]
Wildlife Habitat, Route 3, Box 178, Owatonna MN 55060; 507-451-6771

[aquatic and emergents]
Wildlife Nurseries Inc., P.O. Box 2724, Oshkosh WI 54903; 920-231-3780

Suppliers of Erosion Control Materials

AGT Specialty Nets and Profiles, 96 Swampscott Road, Salem MA 01970; 800-331-8441

A H Harris & Sons, Inc., 321 Ellis Street, New Britain CT 06051; 860-223-3772
http://www.ahharris.com/home.htm

American Excelsior Co., P.O. Box 5067, Arlington TX 76011; 817-640-1555
http://www.amerexcel.com/

Bestmann Green Systems, Inc., 53 Mason Street, Salem MA 01970; 508-741-1166

Bon Terra America, 355 W. Chestnut Street, Genesse ID 83832-9570; 800-882-9489
http://www.fixsoil.com

New England Geotextiles Co. Inc., No. 9 Palfry Street, Worcester MA 01604; 508-756-3734

Information Resources

More information on many topics covered in this publication can be found in several videos, many books and articles, and from a variety of public and nonprofit agencies.

Videos

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Keeping Our Shores: Shoreland Best Management Practices. Minnesota Arrowhead Water Quality Team. 1996. VH-6947-GO, University of Minnesota Extension Service, St. Paul, Minnesota.
The Living Shore, Best Management Practices for Shoreland Vegetation. Minnesota Arrowhead Water Quality Team. 1998. VH-7129-GO, University of Minnesota Extension Service, St. Paul, Minnesota.
Standing Firm Against Erosion, Best Management Practices for Shoreland Stabilization. Minnesota Arrowhead Water Quality Team. 1998. VH-7130-GO, University of Minnesota Extension Service, St. Paul, Minnesota.

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Organizations and web sites

Butterflies of North America

Northern Prairie Wildlife Research Center, 8711 37th Street Southeast, Jamestown ND 58401; 701-253-5500

http://www.npwrc.usgs.gov/resource/distr/lepid/bflyusa/bflyusa.htm

Cornell University

Biological Control: A guide to natural enemies in North America

http://www.nysaes.cornell.edu/ent/biocontrol/

Minnesota Department of Natural Resources

DNR Information Center, 500 Lafayette Road, St. Paul MN 55155-4040; 651-296-6157 or 888-646-6367

e-mail: info@dnr.state.mn.us

Sustainable Shoreland Ecosystems

http://www.dnr.state.mn.us/waters/shoreland

Minnesota Native Plant Society

220 Biological Sciences Center, University of Minnesota, 1445 Gortner Avenue, St. Paul MN 55108

http://www.stolaf.edu/depts/biology/mnps/

Minnesota State Horticultural Society

1755 Prior Avenue North, Falcon Heights MN 55113-5549; 612-643-3601

http://www.northerngardener.org/

National Wildlife Federation

8925 Leesburg Pike, Vienna VA 22184; 703-790-4000 or 800-822-9919

http://www.nwf.org

Native Plant Conservation Initiative

http://www.aqd.nps.gov/npci/index.htm

Trout Unlimited

1500 Wilson Boulevard, Suite 310, Arlington VA 22209-2404; 703-522-0200 or 800-834-2419

http://www.tu.org

United States Environmental Protection Agency

Adopt Your Watershed (http://www.epa.gov/adopt/)

Green Landscaping with Native Plants (http://www.epa.gov/greenacres/)

Wild Ones Handbook (http://www.epa.gov/greenacres/wildones/)

University of Minnesota

Center for Urban Ecology and Sustainability (CUES)

http://www.entomology.umn.edu/cues/

University of Minnesota Extension Service

Distribution Center, 1420 Eckles Avenue, St. Paul MN 55108; 612-625-8173 or in Minnesota contact a county extension office

http://www.extension.umn.edu

University of Minnesota Department of Fisheries and Wildlife, Goose Control

1980 Folwell Avenue, St. Paul, Minnesota 55108-6124; 612-624-3600

http://www.fw.umn.edu/research/goose/html/

University of Minnesota Water Resources Program

http://www.extension.umn.edu/Environment/

University of Wisconsin Extension Water Resources Programs

Environmental Resources Center, UW-Madison College of Agriculture and Life Sciences, Agriculture Hall, Room 216, 1450 Linden Drive, Madison WI 53706-1562; 608-262-1916 or 608-262-0020

http://clean-water.uwex.edu/

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