

Shoreland Restoration Committee

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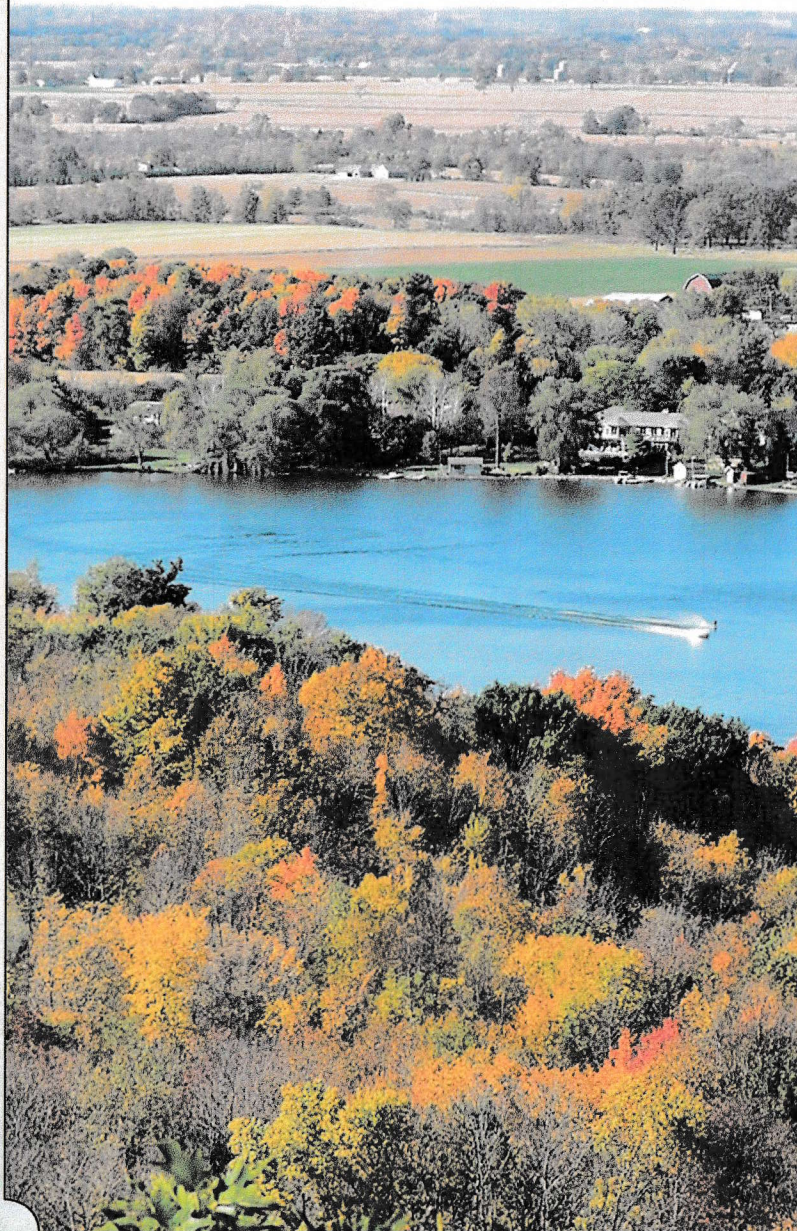
- A. Native Plants and Trees Flyer
- B. Healthy Lakes Primer and Get Started! <https://healthylakeswi.com>
- C. The Teaching of Plants: <https://onwisconsin.uwalumni.com/the-teachings-of-plants/>
- D. Restore Your Shore www.dnr.state.mn.us/restoreyourshore
- E. Many more Publications and extensive information are available through the Wisconsin Department of Natural Resources (dnr.wisconsin.gov) and the University of Wisconsin Extension (www3.uwsp.edu)

1.A.



Protecting Your **Waterfront** *Investment*

10 Simple
Shoreland Stewardship Practices



HEALTHY WATERSHEDS MAKE HEALTHY LAKES and higher property values

The quality of our lakes and streams is ultimately a reflection of how we take care of our land.

A watershed is the land area that drains to a lake or stream. Waterfront property owners, inland residents, recreational users, agricultural producers and other businesses all can play a positive role in maintaining and improving the water quality of our lakes and streams.

How will shoreland stewardship practices affect your pocketbook?

A recent study of over 1,000 waterfront properties in Minnesota found that when all other factors were equal, properties on lakes with clearer water commanded significantly higher property prices.¹ Similarly, higher property values were found on lakes without Eurasian Water-Milfoil.² What you and your neighbors do to sustain or improve water quality will improve resale potential. On the other hand, if water quality is degraded, lower property values could result.

This publication was developed for people who live on developed waterfront lots. It describes three types of opportunities to protect your property investment:

Curb Pollutants

Curb pollutants at their source – fertilizers, household toxins, eroding soils, malfunctioning septic systems.

Cut Runoff

Cut the amount of runoff that picks up pollutants and carries them to the waterway by minimizing the hard surfaces that create runoff.

Capture & Cleanse

Capture and cleanse pollutant-carrying runoff before it reaches the waterway – with shoreland buffers, rain barrels or rain gardens.

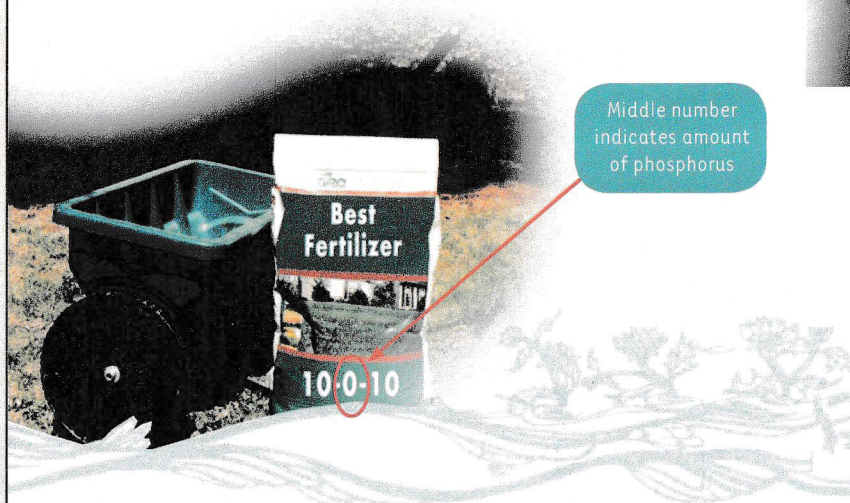
Curb Pollutants

Simple Step 1

Choose zero-phosphorus fertilizer

If you must fertilize, avoid fertilizers that contain phosphorus. Remember, it's phosphorus that accelerates algae growth in our lakes and rivers. Most lawns and gardens already contain adequate — and often excessive — amounts of phosphorus. Based on a study of 236 lawns sampled in Dane County, the average available soil phosphorus concentration was approximately four times higher than the amount needed to maintain a healthy lawn.³ Consider this — one pound of phosphorus in runoff can result in 500 pounds of algae growth!⁴

Phosphorus is an essential nutrient for plants. However, when too much phosphorus makes its way into our lakes and streams it promotes the rapid growth of weeds and algae and decreases water clarity, often turning lakes green. Decaying algae also depletes oxygen in the water, so that fish can no longer thrive. Human activities contribute a great deal to the amount of phosphorus that enters a lake or stream.



Middle number indicates amount of phosphorus

WHEN YOU'RE FERTILIZING THE LAWN, REMEMBER, YOU'RE NOT JUST FERTILIZING THE LAWN.

Reprinted with permission from Department of Natural Resources, Lake County, and the State of Wisconsin, Lake County.



If you follow the instructions on a bag of fertilizer containing phosphorus, you may be adding over 50 pounds of phosphorus to a half-acre lot each year.⁵

Beginning April 1, 2010, fertilizer that is labeled as containing phosphorus or available phosphate cannot be applied to lawns or turf in Wisconsin unless the fertilizer application qualifies under certain exemptions.⁶

Check local ordinances.

Curb Pollutants

Simple Step 2

Properly dispose of household hazardous wastes

Do not pour old oil or pesticides into the ditch or wash paint brushes at the end of your driveway. Where do these pollutants end up? In our groundwater, lakes and streams! Gasoline, oil, solvents, old paints, thinners, fertilizers, pesticides, cleaners and many other products need to be disposed of properly. Some counties offer Clean-Sweep programs where you can take these products for safe disposal. To find out about local options, contact your county Land and Water Conservation Department. You can find their contact information at www.wlwca.org or in the phonebook.

IF YOU WOULDN'T DRINK IT, DON'T DUMP IT!



EVEN BETTER, MINIMIZE YOUR USE OF TOXIC PRODUCTS.

See your county UW-Extension family living educator for alternatives to toxic household products.



Sediment fences serve as a last resort for preventing construction site erosion, but the best policy is to leave the natural shoreline intact.

Simple Step 3

Minimize erosion during construction

During construction is **the** time that soil with its algae-feeding nutrients washes into a nearby lake or stream unless the builder uses erosion controls. When you're planning a construction project, follow these steps to protect the lake:

▶ **DEVELOP AN EROSION CONTROL PLAN.** These publications will help you:

Erosion Control for Home Builders clean-water.uwex.edu/pubs/pdf/storm.erosio.pdf

civicplus.com/DocumentView.aspx?DID=119 They describe how to preserve existing vegetation, build an access drive, install a sediment fence, protect soil piles, clean up sediment and replant the area.

▶ **FENCE THE CONSTRUCTION AREA TO LIMIT CONSTRUCTION ACTIVITY TO THE NECESSARY AREA OF THE SITE.** This approach reduces erosion and soil compaction. In fact, this approach can reduce the amount of sediment and phosphorus delivered to a lake by 18-fold.*

▶ **DIVERT RUNOFF AROUND DISTURBED AREAS TO MINIMIZE EROSION.**

▶ **AFTER CONSTRUCTION, ESTABLISH VEGETATION RIGHT AWAY.** The less time bare soil is exposed, the less erosion you will create.

Simple Step 4

Inspect and maintain your septic system regularly

PUMP OR INSPECT YOUR SEPTIC SYSTEM ONCE EVERY THREE YEARS.⁹

Just like owning a car, there is maintenance, inspection and service required for septic systems in order to prevent premature failure. Inspection and pumping costs (\$50-100) are minor compared to the cost for installing a new system (\$3,000-\$8,500).¹⁰ Hire a licensed pump, plumber or plumbing inspector.

DIVERT SURFACE WATER AWAY FROM THE DRAIN FIELD.

AVOID DRIVING OR PARKING ON THE DRAIN FIELD TO PREVENT COMPACTION OF THE SOIL.

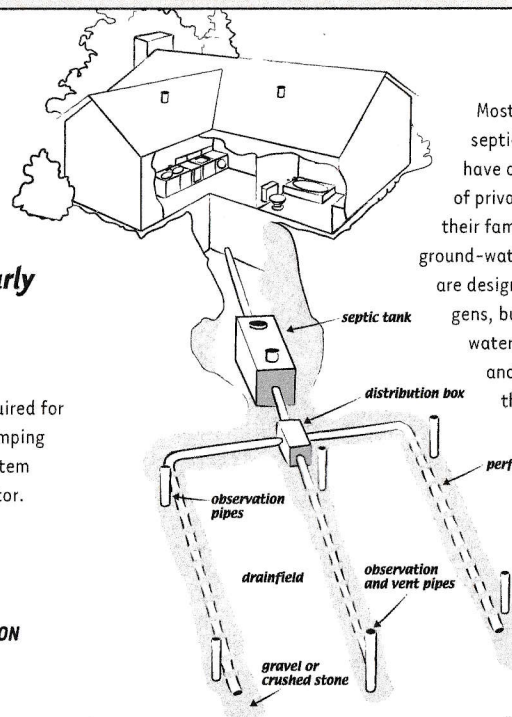
KEEP THE ROOTS OF TREES AND SHRUBS AWAY FROM THE DRAIN FIELD PIPES TO AVOID OBSTRUCTED DRAIN LINES.

WHEN A REPLACEMENT SYSTEM IS NEEDED, CONSIDER AEROBIC DIGESTERS, RECIRCULATING SAND FILTERS and other effluent filtration systems that may do a better job of treating wastes and may be designed to remove nutrients and other contaminants.

AVOID PUTTING ANY OF THE FOLLOWING MATERIALS DOWN THE DRAIN OR TOILET BECAUSE THEY MAY CLOG THE DRAIN FIELD: Cooking grease, oils, coffee grounds, cigarettes, facial tissues, paper towels, sanitary napkins, tampons or disposable diapers.¹¹

AVOID USING A GARBAGE DISPOSAL. Compost your vegetable scraps instead.

CONSERVE WATER. Use low-flow toilets, faucets and showerheads to reduce the volume of water the system must filter and absorb.



Most waterfront homeowners in Wisconsin utilize a septic system, although some densely developed lakes have converted to public sanitary sewer systems. Owners of private septic systems have a responsibility to protect their family's health, as well as to protect the surface and ground-water from contamination. Properly functioning systems are designed to remove most disease-causing human pathogens, but generally are NOT designed to remove or treat water-soluble nutrients or pollutants.¹² The more water and material that goes into your septic system, the more that comes out into your drain field. Recent research at the University of Wisconsin-Stevens Point on septic systems located in sandy soils has found both phosphorus and nitrates migrated underground over 150 feet from drain fields. If these nutrients seep underground into the lake, aquatic plant growth and algae blooms are likely results.

Malfunctioning systems are especially harmful. Effluent from failed systems can result in direct contamination of well or surface water and could cause serious human health risks. Reasons for septic system failure may include advanced age, overloading, poor site placement and/or poor maintenance.

EVIDENCE OF A MALFUNCTIONING SEPTIC SYSTEM:

- ▶ Sewage backing up in the basement or drains.
- ▶ Ponded water or wet areas over the drain field.
- ▶ Bright green grass over the drain field.
- ▶ A dense stand of aquatic plants along only your shoreland.
- ▶ Sewage odors.
- ▶ Bacteria or nitrate in nearby well water.
- ▶ Biodegradable dye flushed through your system is detectable in the lake.



Cut Runoff

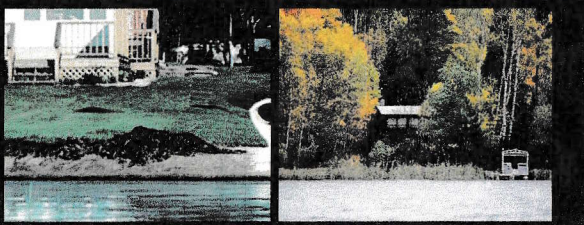
Runoff is excess water that comes from hard surfaces like roof tops, driveways, parking areas, sidewalks, decks and compacted soils. Runoff water washes fertilizer, eroded soil, car fluids and other pollutants into our lakes and streams. To reduce runoff, let water soak into the ground.

Simple Step 5

Reduce the hard surfaces like rooftops and driveways on your property

When considering additions, decide whether the extra space is really needed. Perhaps you could build up instead of out. Also consider runoff from decks, sidewalks and parking areas. Gravel areas quickly become compacted and are nearly as impervious as paved surfaces. Pervious pavers are an option for areas that do not have heavy traffic.

**WHICH LOTS
WILL CREATE
MORE
RUNOFF?**



Simple Step 6

Plant trees and shrubs or protect your wooded areas

Wooded areas develop a thick understory of small shrubs and plants and a duff layer. This duff protects soil from rain impact and absorbs water. Root systems keep the duff in place, not in the lake. Lawns absorb little rainfall. A recent Wisconsin study found that lawns created much more runoff than wooded areas. As a consequence, the runoff from lawns carried eight times more phosphorus to the lake than the runoff from similar sized wooded areas.¹³

LAWNS CREATE MORE RUNOFF BECAUSE:

- ▶ Grading a lot removes the natural divots where water naturally ponds and has time to soak in.
- ▶ Heavy equipment, vehicles, lawn mowers and foot traffic compact the soils during and after construction.
- ▶ Removal of trees and shrubs causes more rain to hit the ground and run off rather than landing on leaves and branches.

Allowing water to soak in rather than run off your property filters out pollutants and replenishes our groundwater.



Capture & Cleanse

Simple Step 7

Direct downspouts onto your lawn or landscaping, not onto hard surfaces

Simple Step 8

Install a rain barrel

Collect water from your rooftop to water your yard during dry periods. The barrel should be covered to keep out silt, leaves and insects.



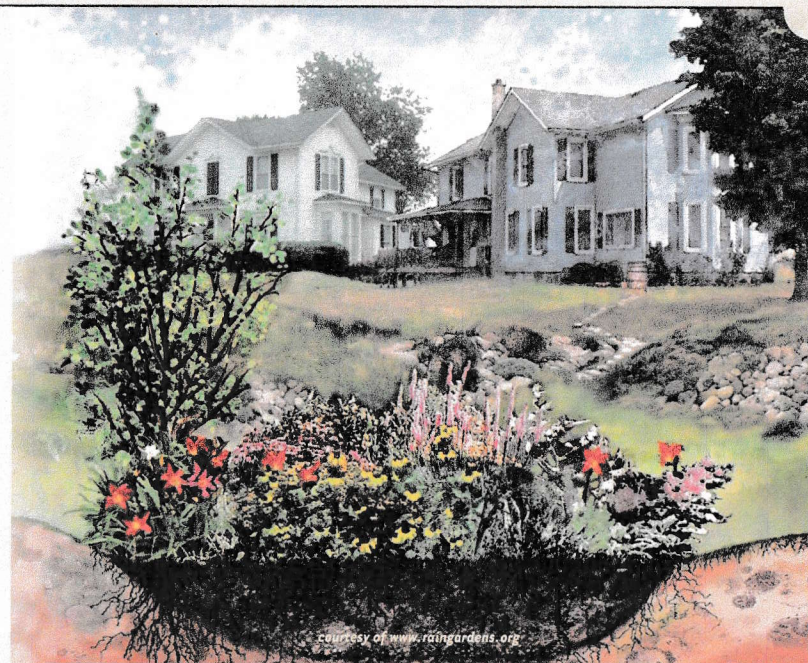
Simple Step 9

Build a rain garden

Rain Gardens: A How-To Manual for Homeowners provides easy-to-follow instructions to create a rain garden providing guidance on the following questions:

- ▶ **Where is a good spot in my yard for a rain garden?**
- ▶ **How big should it be?**
- ▶ **What plants would work well?**
- ▶ **What do I need to do after it's planted?**

This publication is available through county UW-Extension offices, and at: learningstore.uwex.edu/assets/pdfs/GWQ037.pdf



*Rain Gardens
a beautiful solution to water pollution*

HOW DOES A RAIN GARDEN WORK?

Rain gardens are just what they sound like – areas that soak up rain water during wet times and serve as a beautiful garden all the time. They are landscaped areas planted to wildflowers and other native vegetation to replace areas of lawn. The gardens fill with a few inches of water and allow the water to slowly filter into the ground.¹⁴ The plants in the rain garden act as filters for the rain water, helping to slow the runoff and allowing it to soak into the ground rather than flowing out into storm sewers, ditches, or drainage ways on the way to lakes and streams. Keeping rain on your property, where it naturally belongs, will help solve some of our water pollution problems.

In addition to the benefits they provide to our water supply, rain gardens also provide wildlife habitat for birds, butterflies and dragonflies and are an aesthetically pleasing addition to any property.

Simple Step 9

Protect or restore your shoreland buffer

If you have native vegetation along your shoreline, consider yourself and the local wildlife fortunate. A mature native buffer represents many years of nature at work and discourages undesirable, exotic plants and animals while attracting songbirds, butterflies, turtles and frogs.

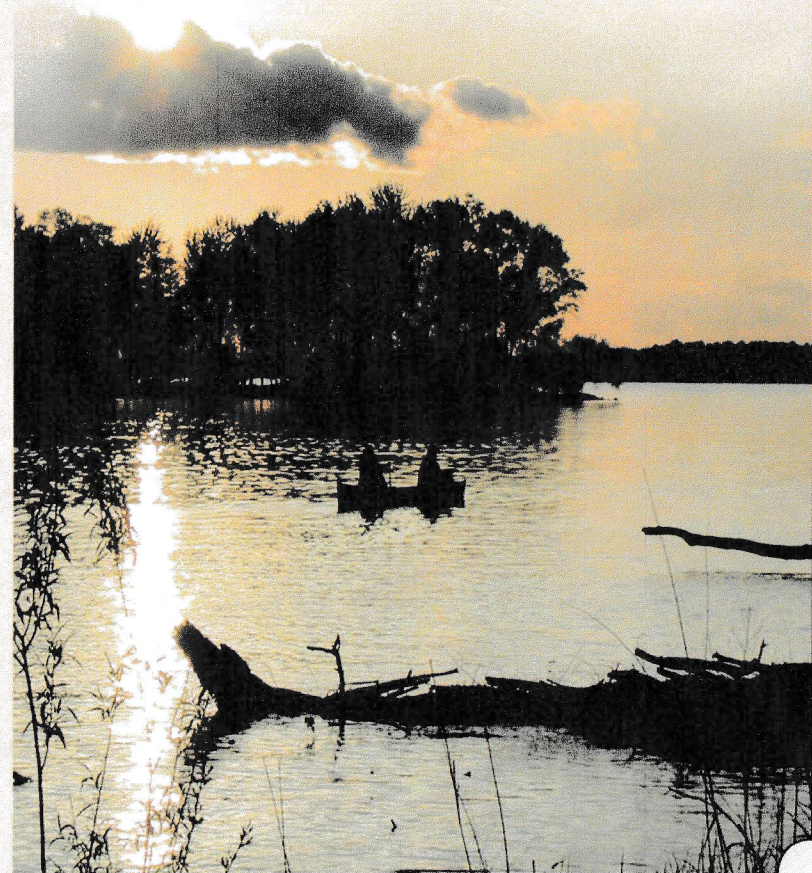
If you have lawn to the water's edge, a simple, no-cost way to get started in restoring your shoreland is to stop mowing next to the water. Seeds in the soil will germinate and valuable native plants will begin to reappear.

If you have lawn to the water's edge and would like to play a more active role in restoring your shoreland, you can replant native trees, shrubs, grasses and wildflowers to attract songbirds and butterflies. The main area where water runs off your property is the best location to start planting to improve water quality. You can create a natural, appealing waterfront landscape while eliminating expensive and time-consuming lawn care. The publication **Protecting and Restoring Shorelands** (learningstore.uwex.edu/Assets/pdfs/GWQ038.pdf) will help you think about what benefits you want from your buffer and the size needed to achieve these. For help designing and planting a natural shoreland, contact your County Land and Water Conservation Department listed at www.wlwca.org or a local nursery that specializes in native landscapes. Some counties have cost-share programs to help restore your shoreland.

Natural shorelands contain a lush mixture of native grasses, flowers, shrubs and trees that help to filter polluted runoff and provide important habitat for animals in the water and on the land. The trees, shrubs and plants not only help shelter and create privacy for both the homeowner and the lake user, but may also act as a noise buffer. Larger areas of natural shoreline provide more benefits. However, any amount of natural shoreline is better than none.

Flourishing shorelands provide some of the most effective protection for the lakes and streams of Wisconsin.

When trees and branches fall in the water, they form critical habitat for tiny aquatic organisms that feed bluegills, turtles, crayfish and other critters. Additionally, a fallen tree is like a dock for ducks and turtles, as well as serving as a perch for kingfishers, osprey and songbirds.



Endnotes

1. Krysel, Charles et al. June 2003. Lakeshore property values and water quality: Evidence from property sales in the Mississippi headwaters region. www.friendscvf.org/bsu_study.pdf
2. Horsch, Eric J. et al. 2009. The Effects of Aquatic Invasive Species on Property Values: Evidence from a Quasi-Experiment. *Land Economics*, 85(3):391-409. <http://171.66.125.237/cgi/content/abstract/85/3/391>
3. Bennett, E.M. 2003. Soil phosphorus concentrations in Dane county, Wisconsin, USA: An evaluation of the urban-rural gradient paradigm. *Environmental Management* 32, no. 4: 476-487 and Bennett, E.M. personal communication 4/13/05.
4. Henderson, Carrol L. et al. *Lakescaping for Wildlife and Water Quality*. Minnesota Department of Natural Resources, p. 27.
5. Calculated by Kate Demorest, UW-Stevens Point.
6. Turf Fertilizer: Restrictions on Use, Sale & Display for Homeowners http://datcp.wi.gov/Environment/Fertilizer/Turf_Fertilizer/
7. How we are "killing" our local lakes and wetlands with leaves and grass clippings. Ramsey-Washington Metro Watershed District, Maplewood, MN
8. Wisconsin Department of Natural Resources memo from John Panuska 11/6/94. Graphic by Wisconsin Lakes Partnership
9. Department of Commerce, COMM 83
10. Portage County Onsite Waste Specialist, personal communication 8/5/04.
11. *Life on the Edge*, 7th ed. Dresen, Michael and Robert Korth. 2003. University of Wisconsin-Extension, College of Natural Resources, UW-Stevens Point.
12. Pierce, Bryan; Kraft, George and Paul McGinley. August 2003. Guarding Our Groundwater. UW-Extension. www.uwex.edu/ces/shoreland/modules.htm
13. Graczyk, David J. et al. 2003. Hydrology, Nutrient Concentrations, and Nutrient Yields in Nearshore Areas of Four Lakes in Northern Wisconsin, 1999-2001. p 41, USGS Water Resources Investigation Report 03-4144. water.usgs.gov/pubs/wri/wri03-4144/
14. Rain Gardens: A Household Way To Improve Water Quality in Your Community by University of Wisconsin-Extension, publication GWQ034, and Wisconsin Department of Natural Resources publication WT 731-2002, learningstore.uwex.edu/assets/pdfs/GWQ034.pdf

In addition to this booklet and the resources below, we encourage you to join your local lake or river association, Wisconsin Association of Lakes, River Alliance of Wisconsin or other conservation groups. Additional resources, training and workshops may also be available through your county UW-Extension or Land and Water Conservation office, or local DNR office.

Additional Information:

GENERAL REFERENCES:

The Living Shore. A 17-minute video showing the importance of leaving a natural 'buffer zone' between the lake and lake owners' dwellings, and providing information about selecting and planting shoreline plants. UW-Extension and University of Minnesota Extension. Phone: 888-936-7463 <http://cyfernet.extension.umn.edu/distribution/naturalresources/DD8307.html>

Life on the Edge... Owning Waterfront Property. UW-Extension Lakes Program. Comprehensive guide for waterfront property owners. 112 pages. Phone: 715-346-2116 or email uwexlakes@uwsp.edu

PHOSPHORUS:

Phosphorus in Lawns, Landscapes and Lakes. 2004. Minnesota Department of Agriculture and partners. Phone: 651-296-6121 www.mda.state.mn.us/news/publications/chemfert/reports/phosphorusguide.pdf

Understanding Lake Data. 2004. UW-Extension and Wisconsin DNR (G3582) learningstore.uwex.edu/Assets/pdfs/G3582.pdf

Brown Water, Green Weeds. 2001. UW-Extension (GWQ003) and Wisconsin DNR (WT-459-92) learningstore.uwex.edu/Assets/pdfs/GWQ003.pdf

FERTILIZER:

Lawn & Garden Fertilizer. 2008. UW-Extension (GWQ002) and Wisconsin DNR (WT-528-99) learningstore.uwex.edu/Assets/pdfs/GWQ002.pdf

Rethinking Yard Care. 2008. UW-Extension (GWQ009) and Wisconsin DNR (WT-526-99) learningstore.uwex.edu/Assets/pdfs/GWQ009.pdf

EROSION CONTROL AND RUNOFF

Erosion Control for Homebuilders. 1999. UW-Extension (GWQ001) and Wisconsin DNR (WT-457-96) learningstore.uwex.edu/Assets/pdfs/GWQ001.pdf

Controlling Runoff and Erosion from Your Property: A Landowner's Guide. 2008. Burnett County Land and Water Conservation Department and partners. www.burnettcounty.com/DocumentView.aspx?DID=119

SEPTIC SYSTEMS

Care and Maintenance of Residential Septic Systems. 2006. UW-Extension (B3583) learningstore.uwex.edu/assets/pdfs/B3583.pdf

STORMWATER RUNOFF

A Storm on the Horizon: An Educational Video on the Effects of Stormwater on Our Rivers. 18 minute video by Trout Unlimited.

Phone: 715-386-7568 or email andrewlamberson@hotmail.com

RAIN GARDENS

Rain Gardens ... A Household Way To Improve Water Quality in Your Community.

2002. UW-Extension (GWQ034) and Wisconsin DNR (WT-731-2002)

learningstore.uwex.edu/Assets/pdfs/GWQ034.pdf

Rain Gardens: A How-To Manual for Homeowners. 2003. UW-Extension

(GWQ037) and Wisconsin DNR (WT-776 2003) Phone: 608-267-7694

learningstore.uwex.edu/assets/pdfs/GWQ037.pdf

Wisconsin Native Plants for Rain Gardens. dnr.wi.gov/runoff/rg/plants/PlantListing.htm

Wisconsin Native Plants for Shady Rain Gardens. dnr.wi.gov/runoff/rg/plants/shady/shady.htm

SHORELAND BUFFERS

The Waters Edge: Helping Fish and Wildlife on Your Waterfront Property.

2000. Wisconsin DNR (PUB-FH-428 00). learningstore.uwex.edu/Assets/pdfs/GWQ040.pdf

Shoreland Restoration: A Growing Solution. 2001. A 15 minute how-to guide.

UW-Extension (GWQ032) Phone: 877-947-7827. <http://cyfernet.extension.umn.edu/distribution/naturalresources/DD8307.html>

Restoration Stories. 2003. UW-Extension and Wisconsin DNR.

www.burnettcounty.com/DocumentView.aspx?DID=120

Protecting Our Living Shores — UWEX (GWQ039) DNR (WT-764-2003)

learningstore.uwex.edu/Assets/pdfs/GWQ039.pdf

Protecting and Restoring Shorelands — UWEX (GWQ038) DNR (WT-748-2003)

learningstore.uwex.edu/Assets/pdfs/GWQ038.pdf

A Fresh Look at Shoreland Restoration — UWEX (GWQ027) DNR (FH-429-2003)

learningstore.uwex.edu/Assets/pdfs/GWQ027.pdf

Lakescaping for Wildlife and Water Quality. Minnesota Department of Natural

Resources. The best detailed planning guide available for shoreland restoration in Wisconsin. 180 pages. Phone: 800-675-3757

Wisconsin Native Plant Sources. 2004. UW-Extension (GWQ041) and Wisconsin DNR (WT-802). learningstore.uwex.edu/Assets/pdfs/GWQ041.pdf

INVASIVE SPECIES

We all have an important role to play in keeping our lakes, streams, and landscapes free of invasive species. The main way aquatic invasives spread to new waters is by hitching a ride on the boats and equipment of the very people who enjoy the water the most.



NEW LEAF PAPER®

ENVIRONMENTAL BENEFITS STATEMENT of using post-consumer waste fiber vs. virgin fiber

UW-Extension & DNR saved the following resources by using Reincarnation Matte (FSC), made with an average of 100% recycled fiber and an average of 60% post-consumer waste, processed chlorine free, designated Ancient Forest Friendly™ and manufactured with electricity that is offset with Green-e® certified renewable energy certificates.

trees	water	energy	solid waste	greenhouse gases
13 fully grown	6100 gallons	4 Million BTUs	370 pounds	1267 pounds

Calculations based on research by Environmental Defense and other members of the Paper Task Force

www.newleafpaper.com





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DNR PUB WT-821 2012



UW-Extension Center for
Land Use Education



UWEX Publication GWQ044
R-09-10-20M-50

UW
Extension

1.B.

HOW WILL YOU IMPROVE YOUR LAKE OR RIVER?

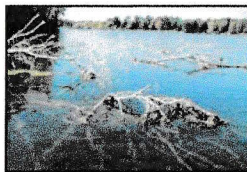


ILLUSTRATION: KAREN ENGELBRETON

1 FISH STICKS

CREATE FISH AND WILDLIFE HABITAT.

Fish Sticks are feeding, breeding, and nesting areas for all sorts of critters – from fish to song birds. They can also prevent bank erosion – protecting lakeshore properties and your lake. (Not eligible on river properties.)



2 NATIVE PLANTINGS

IMPROVE WILDLIFE HABITAT, NATURAL BEAUTY AND PRIVACY, AND SLOW RUNOFF.

Native Plantings include grasses and wildflowers with shrubs and trees. Choose a template based on your property and interests – from bird/butterfly habitat to a low-growing garden showcasing your water view.



3 DIVERSION*

PREVENT RUNOFF FROM GETTING INTO YOUR LAKE OR RIVER.

Diversion Practices move water to areas where it can soak into the ground instead. Depending on your property, multiple diversions may be necessary.



4 ROCK INFILTRATION*

CAPTURE AND CLEAN RUNOFF.

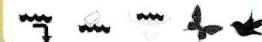
Rock Infiltration practices fit in nicely along roof drip lines and driveways and provide space for runoff to filter itself. They work best if your soil is sandy or loamy.



5 RAIN GARDEN*

CREATE WILDLIFE HABITAT AND NATURAL BEAUTY WHILE CAPTURING AND CLEANING RUNOFF.

Rain Gardens multi-task - they improve habitat and filter runoff while providing a naturally beautiful view.



IMPROVE HABITAT AND NATURAL BEAUTY ~ SLOW, DIVERT, CLEAN AND FILTER RUNOFF

*Eligible for shoreland properties within 1000 feet of a lake or 300 feet of a river.

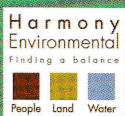
Self-Evaluation Checklist for Waterfront Runoff

Runoff from waterfront property impacts water quality and may cause unsightly erosion problems for you.

Use this checklist to assess the need for water quality improvements on your property.

- Analyze water flow patterns and sources of runoff on your parcel
- Consider potential solutions to runoff problems
- Find out where to go for additional assistance

Harmony Environmental
Wisconsin Department of Natural Resources



Graphic design: KJE Design LLC
Narrative: Harmony Environmental
Published 2015

DNR PUB WY-004

Are all areas of your parcel well covered with vegetation?

- ☐ **Yes** Good, a cover of vegetation prevents erosion to the water. Native plants with deep root systems are especially good for preventing erosion.
- ☐ **No** Areas of bare soil may lead to significant erosion and deposition of sediment and nutrients in the water. Let's see if there's a way to address the problem.

Consider the possible cause of areas of bare soil...

☐ **Foot traffic?**

Consider re-routing your pathway. Curved pathways can help to slow and divert water flow and reduce erosion. Add stepping stones to prevent erosion of soil. County permits may be required for stairs and pathways. Do not pave or cement the area — increased impervious surfaces result in more runoff and can increase erosion.

☐ **Shade?**

Plant native shade-tolerant vegetation such as big leaf aster or Pennsylvania sedge in sandy, dry soils or ferns in moist soils. This vegetation may not tolerate much foot traffic. You might also seed each year with fast-growing annual rye grass (available at hardware and garden stores).

☐ **Construction project?**

It is especially important to protect your property from erosion when areas are cleared for construction. Install silt fences down-slope of bare soil, and revegetate bare soil as quickly as possible. See page 4 for resources for additional construction site practices to prevent erosion.

☐ **Water flow?**

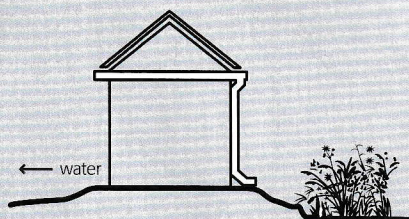
If water is washing away soil and vegetation, look uphill to the source. Identify the area that drains to your problem spot, and divert the flow of water to an infiltration practice as close to the source as possible. See examples below.

TIP: Try to divert water as close to the source as possible. It is easier to deal with smaller quantities of water before they pick up speed running downhill.

Are there deposits of soil in flat areas?

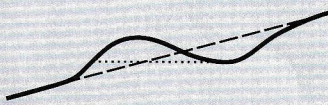
- ☐ **Yes** Deposits of sand show that runoff water carries a significant sediment load. It also probably means that smaller silt and clay particles that carry a higher nutrient load have made their way to the water.
- ☐ **No** This is probably a good thing. When the flow of water carrying sediment slows, particles of sand which are larger than other soil particles, will frequently settle out. If you have no deposits, it may mean that your runoff is clean. However, be cautious; it may simply mean that water doesn't have a chance to slow down, and runoff is carried all the way to the water.

Water diversion practices *Such as ways for water to flow to an infiltration practice and/or away from the water.*



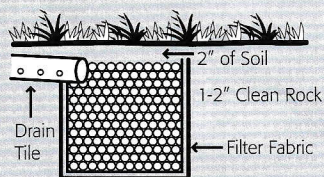
Rain Gutters

Rain gutters should discharge at the back of the house away from the water, or to a rain barrel or infiltration area.



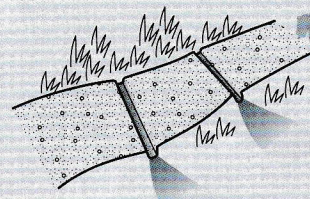
Berms

Gradual berms or bumps can retain or move water.



Drain Tile

Drain tile, perforated plastic pipe, allows some infiltration as water is moved to an infiltration practice.



Path Diversions

Divert water across a pathway or driveway at intervals using pipes or channels.

Does water flow across your parcel evenly?

During or after a big rainstorm is a good time to check. You can sometimes see the pathway of water flow by looking for leaves or pine needles that have washed downhill or grass that is laying flat.

- ☐ **Yes** Avoiding channelized flow of water will help to reduce erosion and minimize pollutants that reach the water.
- ☐ **No** If there are obvious paths of water flow, look uphill to the source of water. Could water be diverted to an infiltration practice?

Do you have natural, wild vegetation within the 35 foot buffer zone adjacent to the waterline?

- ☐ **Yes** Good for you! Your property is an example for other waterfront property owners. You are helping to keep the water clean while providing habitat for the many creatures that live near the water's edge.
- ☐ **No** Please consider a natural shoreline buffer of native vegetation. Lawn grasses have shallow root systems and short stems. The deep roots and tall stems of native vegetation slow runoff flow preventing erosion and allowing infiltration.

Want to do more? Help is available.

Arrange a site visit or consultation, or

Contact your local land and water conservation department for more information.

Listings are available online at www.datcp.state.wi.us.

Keyword search: "LCD Directory."

Get help from a professional consultant.

Many local landscapers have attended training to learn about rain gardens and other native landscaping and infiltration practices. Check local listings and ask about experience and qualifications.

TIP: Native Wisconsin plant lists may be available from your local land and water conservation department. Or try the web resources at <http://healthylakeswi.org>

CAUTION:

Call Diggers Hotline 1.800.242.8511 to locate utility lines before you dig!

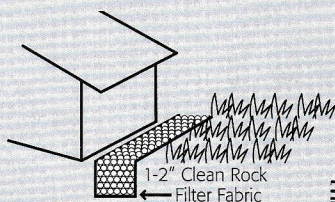
Permits may be required for waterfront landscaping and construction. Contact your local zoning office to determine which activities require a permit.

Infiltration practices *Such as places for water to soak into the soil.*



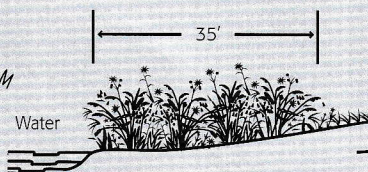
Rain Gardens

Sunken gardens planted with native flowers capture runoff water and add beauty to your yard.



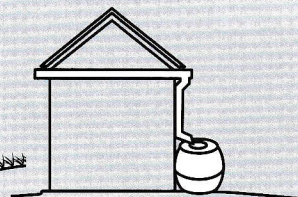
Infiltration Trenches

Capture water next to pole buildings and garages.



Natural Buffer Zones

These areas of tall vegetation slow runoff flow, allowing it to soak into the soil (especially on gradual slopes).



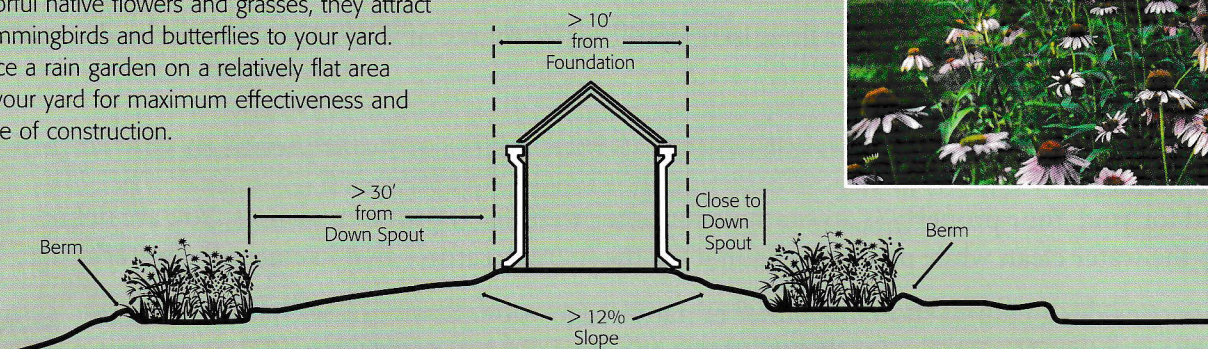
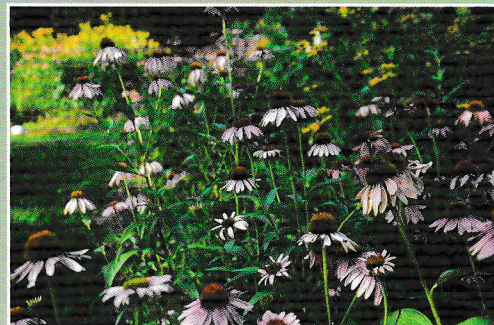
Rain Barrels

Save the rain water from your roof to water your plants.

Waterfront Water Quality Practices

Rain Gardens

Rain gardens are designed to capture runoff from rain events and absorb water over several hours to a few days. Absorbed water is filtered and purified by the soil. When rain gardens are planted with a variety of colorful native flowers and grasses, they attract hummingbirds and butterflies to your yard. Place a rain garden on a relatively flat area of your yard for maximum effectiveness and ease of construction.



Rain Barrels

Rain barrels capture water from a rain gutter downspout for watering gardens and potted plants. Many styles are available for purchase or you can build your own. Be sure that your rain barrel is covered to prevent mosquitoes from laying eggs and reproducing.



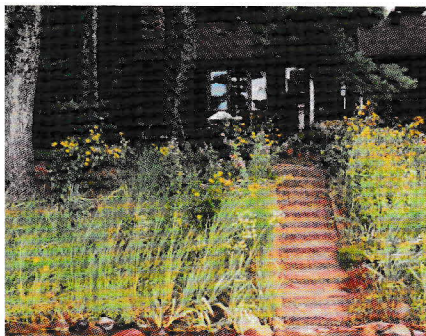
Infiltration Areas

Infiltration areas may be flat areas of woods or tall grasses or constructed pits or trenches. Where the slope is flat and the soil is sandy, it may be possible to simply divert water to an area where it can soak in. Other times infiltration areas are constructed by digging a pit or trench, lining it with porous landscape fabric, and filling the void with 1-2 inch clean rock. The size and depth depends upon the size of the area draining to the infiltration area and the type of soil beneath it. Do not encourage infiltration over a septic drain field, near a drinking water well, or within 10 feet of the foundation of your house.



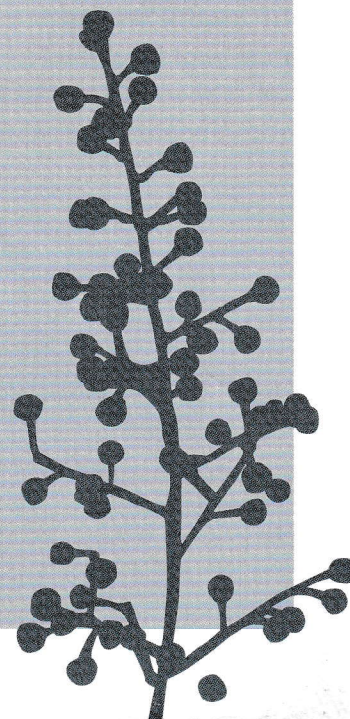
Shoreline Buffers

Shoreline buffers are areas of native trees, shrubs, and groundcovers. Natural buffers of shoreline vegetation have many benefits. They keep the water clean by filtering runoff and holding soil in place, create natural northwoods beauty, and provide a home for the diversity of creatures who live near the water. Shoreline buffers should be designed to follow NRCS Tech Note One standards so that you can still access and enjoy your view of the water.



Learn More

Visit the *Healthy Lakes* website
<http://healthylakeswi.org>



Why Use Native Plants?

Native plantings fit into the bigger picture of lake management and help improve water quality and quantity. Native plantings enhance wildlife habitat, slow runoff water, and promote natural beauty. Native plants are adapted to the local climate and soil conditions where they naturally occur. Benefits of native plantings include:

- 1) native plants do not require fertilizers and require fewer pesticides than lawns – overall lower maintenance after they are established (no mowing!), easier to grow and less expensive to maintain.
- 2) native plants require less water than lawns – native plants are accustomed to their habitat and are more resistant to local weather.
- 3) native plants help prevent erosion – native plants tend to have deep roots which helps the soil store water (ties in with #2) and also helps keep slopes and shorelines stable.
- 4) native plants offer shelter and food for wildlife - native plants provide nectar, pollen, and seeds that are food for butterflies, insects, birds, and other animals. They will help to counter-act the declining numbers of our native populations of insects and birds!
- 5) native plants promote biodiversity - biodiversity is the number and variety of living things in a specific region.
- 6) native plants are not invasive.
- 7) native plants are beautiful!

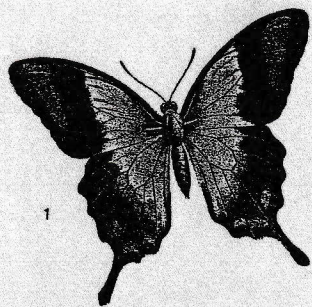
For buffers, native plants are used because they are best adapted for our climate and provide ideal habitat for our wildlife. Shoreline buffers protect from erosion and filter out sediment and nutrients before the water enters the lake. Healthy Lakes and Rivers provides guides (plant and layout guides for 350 ft² native plantings) and grants to install native buffers. 350 ft² buffers ideally should start at the water's edge, be at least 10 feet wide – parallel or perpendicular to the shore, and contiguous rather than planted in patches. Additional information can be found on the healthy lakes and rivers website.

References:

https://www.fs.fed.us/wildflowers/Native_Plant_Materials/Native_Gardening/index.shtml

<https://healthylakeswi.com/best-practices/#350>

<https://extension.psu.edu/why-use-native-plants>

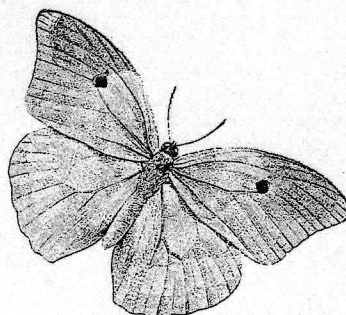


1.E.

BUTTERFLY GARDEN

- Bergamot – Lavender – (Mint Family)
Black Eyed Susan – Yellow – (Daisy Family)
Blue Vervain – Deep Blue – (Vervain Family)
Boneset – White – (Aster Family)
Branch Leaf Cone Flower – Yellow – (Daisy Family)
Butterfly Weed – Bright Orange – (Milkweed Family)
Culver's Root – White or Purplish – (Snapdragon Family)
Daisy Fleabane – White – (Daisy Family)
Golden Alexander – Yellow – (Carrot Family)
Hoary Vervain – Purple to Blue – (Vervain Family)
Nodding Wild Onion – Rose or White – (Lily Family)
Prairie Coneflower – Yellow-Gray Headed – (Daisy Family)
Purple Cornflower – Purple – (Daisy Family)
Purple Prairie Clover – Purple – (Pea Family)
Rattle Snake Master – Greenish White – (Parsley Family)
Rough Blazing Star – Purple – (Aster Family)
Smooth Aster – Lavender-blue – (Aster Family)
Spiderwort – Blue – (Spiderwort Family)
St. John's Wort – Yellow – (Hypericaceae)
Vipers Bugloss – Blue – (Borage Family) ALIEN
White Champion Bladder – White – (Carnation Family)
White Vervain – White (Vervain Family)
Wild Columbine – Red and Yellow – (Buttercup Family)

Wildflower Supplier
Connie Ramthun
W611 Birchwood Drive
Campbellsport, WI 53010 Tel: 920-533-8939



PURPLE LOOSESTRIFE

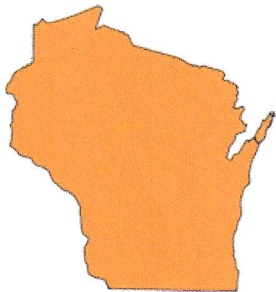
(LYTHRUM SALICARIA)

1.F.i.



Photo credit: S. Kelly Kearns

Wetland perennial, three to seven feet tall, with up to 50 stems topped with purple flower spikes. One prominent leader stems but many side branches often make the plant look bushy. Clipped plants grow back and cut stems readily re-root in the soil to produce new plants. Many areas of the state use safe biocontrol beetles that feed on the loosestrife to keep it in check and allow other plants to grow.



Restricted (orange) counties

Other names for this plant include:

- Common words: spiked loosestrife
- Scientific names: *L. salicaria* var. *tomentosum*; *L. salicaria* var. *vulgare*

Classification in Wisconsin: Restricted

Mechanical: Young, small plants can be dug or pulled. Larger plants can be explored if all root fragments are removed. Burn, landfill or bury all plant parts deep in the ground. Mowing is not recommended as plant parts re-sprout and seeds may be dispersed.

Chemical: Imazapyr or glyphosate works well against purple loosestrife. If near water a permit may be required and aquatic-use formulas of these herbicides should be used.

Biological: Galerucella beetles have been successful in many parts of the state in controlling purple loosestrife populations. Want to get involved with biocontrol? Please find out more on our [purple loosestrife biocontrol](#) page.

GARLIC MUSTARD

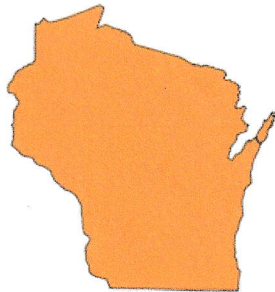
(ALLIARIA PETIOLATA)

1.F.ii.



Photo credit: Wisconsin DNR

Herbaceous biennial with stems 2-4' tall. First-year plants form a basal rosette that remains green through the winter. Second-year plants produce one to several flowering contains.



Restricted (orange) counties

Other names for this plant include:

- Common names: mustard root, garlic root, garlic-wort
- Scientific names: *Alliaria officinalis*; *Alliaria alliaria*; *Arabis petiolata*

Classification in Wisconsin: Restricted

Mechanical: Hand pulls in early spring before seed set. If plants are flowering, place them in plastic bags for trash disposal or burn. Cut plants at their base just after the flower stalks have elongated but before any flowers have opened; they may have to cut more than once during a growing season. Place pulled/cut plants in plastic bags for trash disposal. Use controlled burns in the fall or early spring.

Chemical: Foliar applications of glyphosate in early spring or late fall when native plants are dormant.

For more information on control techniques, visit the [Garlic Mustard factsheet](#) [\[exit DNR\]](#) by the University of Wisconsin-Extension.

COMMON BUCKTHORN

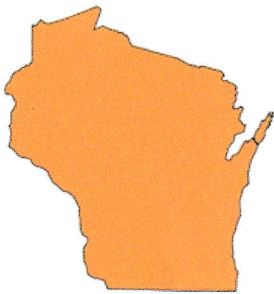
(RHAMNUS CATHARTICA)

1.F.iii.



Photo credit: Wisconsin DNR

Tall understory shrub or small tree up to 20-25' tall, often with several stems arising from the base and spreading crown. Gray to brown bark with prominent light-colored lenticels. (Caution: native plums and cherries have a similar bark). Plants are either male or female. Cut bark exposes yellow sapwood and orange heartwood. Twigs often end in stout thorns.



Restricted (orange) counties

Other names for this plant include:

- Common names: Carolina buckthorn, European buckthorn

Classification in Wisconsin: Restricted

Mechanical:

- Small plants may be hand-pulled and prescribed fire for seedlings. Larger plants can be dug or pulled using a leverage tool such as a weed wrench.
- Girdling trees require stripping the bark to expose the inner hardwood at a minimum of six inches. Adequate any time of year.

Chemical:

- Cut-stump treatment with glyphosate in late fall
- Cut-stump or basal bark spray treatment around the stem with triclopyr ester in late fall through the winter.

For more information on control techniques, visit the [Common buckthorn factsheet](#) [exit DNR]

JAPANESE HONEYSUCKLE

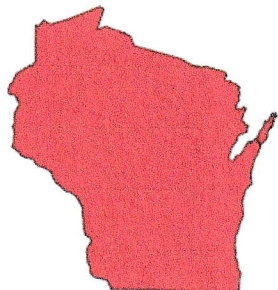
(LONICERA JAPONICA)

L.F. IV.



Photo credit: Nisa Karimi

Perennial, semi-evergreen, woody vine, up to 80' in length. Young stems are brown or red and usually pubescent. Older stems are woody and hollow, with bark that peels in long strips.



Prohibited (red) counties

Other names for this plant include:

- Common names: Hall's honeysuckle vine, Chinese honeysuckle
- Scientific names: *Lonicera aureoreticulata*; *Lonicera japonica* var *halliana*; *L. japonica halliana*

Classification in Wisconsin: Prohibited

Mechanical: Pull or repeated mowing followed up by chemical control. Fire may kill seedlings and set back older plants.

Chemical: Treat foliage with glyphosate or triclopyr amine in the fall when native plants are dormant. Where plants grow off the ground, cut vines just above the soil surface and treat them immediately with glyphosate or triclopyr amine.

For more information on control techniques, visit the [Japanese honeysuckle factsheet](#) ^[exit DNR] by the University of Wisconsin-Extension.

All photos provided by: Bernie Williams, WRISC

J.F.V.

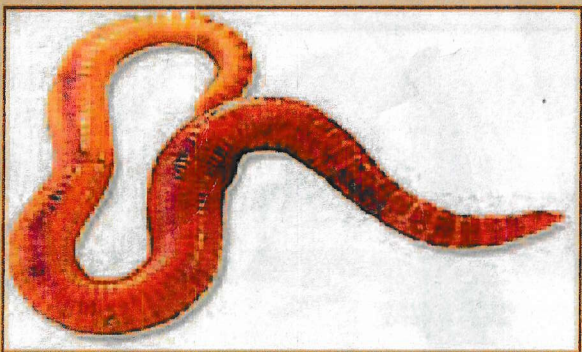
Typical Earthworms You Will See in the Area



Leaf Worm *Lumbricus rubellus*



Nightcrawler *Lumbricus rubellus*



Red Wiggler *Eisenia fetida*

 **BoatU.S. Foundation**
for Boating Safety & Clean Water
Funded by a grant from the BoatU.S. Foundation



Invasive Species Coalition

www.wrisc.org

Want to be an Invasive Species Partner or Volunteer?

Contact the WRISC Coordinator

Phone: (906) 774-8441
Email: wildriverscwma@gmail.com

ATTENTION ANGLERS

UNUSED WORMS?



Toss'em in the TRASH.



EARTHWORMS INVADE OUR WOODLANDS

www.wrisc.org

Wild Rivers Invasive Species Coalition (WRISC) - Knowing Invasive Species is the First Step!

Earthworms Are **NOT** Native to the Great Lakes



Photo by Great Lakes Worm Watch

Area covered in blue contained **no** earthworms before European settlement.

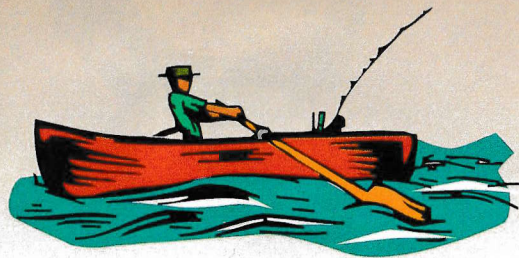


Photo of a forest with earthworms



Photo by Great Lakes Worm Watch

Photo of a forest without earthworms



Photo by Great Lakes Worm Watch

Earthworms dramatically change the hardwood forests

These changes include losses of native understory plant species and tree seedlings, changes in soil structure and decline in nutrient availability, and other changes in the forest that affect small mammal, bird and amphibian populations, increase the impacts of herbivores like white-tailed deer, and facilitate invasions of other exotic species such as European slugs and exotic plants like buckthorn and garlic mustard. A native, but dominating, plant species called Pennsylvania sedge can outcompete tree seedlings and take over the forest floor.

How Are Earthworms Spread?

Earthworms are transported, intentionally and unintentionally, through a range of human activities such as **the dumping of unused fishing bait** and **transporting soil compost & mulch**. Earthworms eggs can also be transported by **hikers shoes and boots**.

Boaters **CAN** Prevent Earthworms From Spreading!

When done fishing, dispose of any live bait into a garbage receptacle.



NATIVE PLANT & TREE RESOURCES

1. NATIVE PLANT IDENTIFIERS

- A. Wisflora (www.botany.wisc.edu/herbarium)
- B. The Tallgrass Prairie Center Guide to Seed and Seedling Identification in the Upper Midwest (Williams, Dave)

2. PROPAGATION

- A. Restoring the Tallgrass Prairie: An Illustrated Manual for Iowa and the Upper Midwest (Shirley, Shirley)
- B. The New England Wildflower Society Guide to Growing and Propagating Wildflowers of the US and Canada (Cullina, William)
- C. Native Trees, Shrubs and Vines: A Guide to Using, Growing and Propagating North American Woody Plants (Cullina, William)

3. OVERVIEW / RESOURCE BOOKS

- A. Landscaping with Native Plants of Wisconsin (Steiner, Lynn M.)
- B. Wildflowers of Wisconsin Field Guide (Tekiela, Stan)
- C. Grow Native (Steiner, Lynn M)
- D. The Garden Book of Wisconsin (Myers, Melinda)
- E. The Midwest Native Plant Primer: 225 Plants for An Earth-Friendly Garden (Branhagen, Alan)
- F. Native Plant Gardening for Birds, Bees & Butterflies: Upper Midwest (Daniels, Janet C.)

4. GENERAL INFORMATION ONLINE RESOURCES

- A. Gardening Publications: www.learningstore.extension.wisc.edu
- B. Soil Testing: <https://hort.extension.wisc.edu>