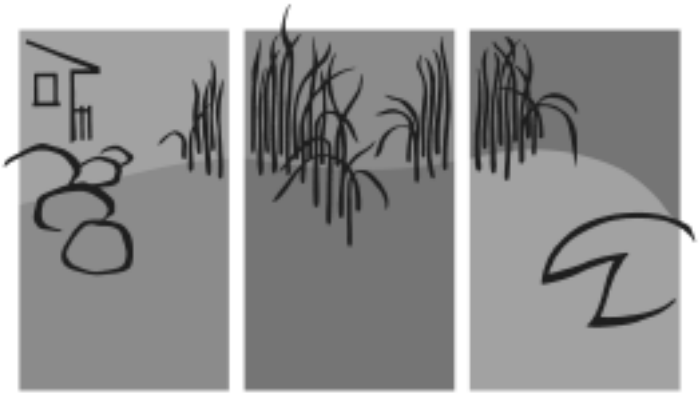


From Shore to Shore

For Minnesota citizens promoting the health of our rivers & lakes

June 2004

#58

Calendar of Events

To register or for more details about a particular workshop, check the Web site at: www.extension.umn.edu/water/shore

→ Maintenance for Shoreland Revegetation Workshops

July 9, 2004 – Ideal Township Hall

July 23, 2004 – Grand Rapids

→ Aquatic Plant Identification Workshops

July 15-16, 2004 – Eden Prairie Environmental Learning Center and Bush Lake, $35

July 19-20, 2004 – Alexandria, Douglas County Extension Office, $35

→ Wetland Plant Identification Workshops

July 30-31, 2004 – Eagan, Lebanon Hills Visitor Center, $35

August 5-6, 2004 – Nisswa Community Center, $35

Introducing ....

Phil Monson, Tana Haugen-Brown, and Sophie Demchik have recently joined the Extension Shoreland Program team. Phil will be working on a six-month appointment to help coordinate Shoreland Volunteers and Woodland Advisors – see his article below.

Sophie Demchik is the new Technical Advisor for Crow Wing County and will be a great addition to our team. Sophie comes to us with a wealth of experience in ecology, horticulture, and biology. She will work with Shoreland Volunteers, shoreland owners and Master Gardeners. You can contact her at demch002@umn.edu; 218-824-1068; fax: 218-828-2424.

Tana Haugen-Brown will be working in Sherburne County as a half-time AFE Technical Advisor. She will provide technical assistance and information in the areas of home/community horticulture and natural resources/ environment. Tana will coordinate Master Gardeners, Shoreland Volunteers, and Woodland Advisor volunteer programs. You can reach her at 763-241-2723 or thbrown@umn.edu.

Calling All Volunteers!

Phil Monson, Cloquet Forestry Center, monso044@umn.edu, 218-726-6471.

Volunteers are the hallmark of the Shoreland Program. Your activities are an important part of Extension's efforts to provide education and information exchange. You are the link that expands that knowledge to a greater community of citizens throughout the state. Past surveys have indicated your strong support of the Shoreland Program, your involvement in volunteer activities, and an interest in staying connected through education events and products like this newsletter. My work over the next few months will focus on gaining a better understanding of how the University might better assist with your needs as a volunteer. My first step as Volunteer Coordinator will be to implement a survey of volunteers guided, in part, by your past responses. Your participation with this survey will be critical. Thank you and have a safe and wonderful summer.■

Biological Control
An Important Part of Integrated Weed Management

Submitted by: Carol Mortensen, Leech Lake Botanist/Invasive Species Project Coordinator, 218-335-7428

A simple definition of biological control is "the use of one living organism to control another living thing." Biological control, or "bio-control" for short, is frequently an important component of many land management agencies' invasive species management plans. Leech Lake Division of Resource Management (DRM) has been using bio-control to manage invasive plants such as purple loosestrife and leafy spurge since 1996. In fact, the DRM received funding through the Bureau of Indian Affairs Noxious Weed Program to build a greenhouse that is used as a regional facility to rear a beetle that feeds on purple loosestrife.

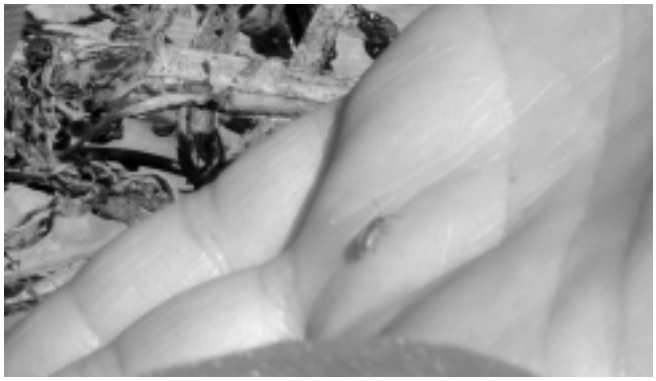
About now you may be thinking, "So what? What do I care about purple loosestrife?" Well, purple loosestrife is just one of about 100 non-native plants that are now found on the Leech Lake Reservation, but it is one of the worst. While it is lovely, and not a problem in its native range of Europe, northern Africa, and Asia, none of its natural enemies are in North America. When it was introduced here, probably early in the nineteenth century in soil used as ship ballast, it found nothing to stop its spread. Spread it did, from New England all across the Upper Midwest, infesting wetlands and shoreland, crowding out native plants and degrading wildlife habitat. On the Leech Lake Reservation it has a foothold on Leech Lake, Cass Lake, Big Lake, Bowstring Lake, and many other smaller lakes, as well as in ditches and wetlands. Unchecked, purple loosestrife can spread and wipe out native plants, reduce open water in wetlands, and possibly reduce wild rice stands.

Releasing trapped beetles into a loosestrife infested area.
Photo credit: Steve Mortenson

Now, back to bio-control. For years, herbicides were the weapon of choice in the battle to control purple loosestrife, but loosestrife was winning. So scientists had an idea. They looked overseas where loosestrife was a natural part of the landscape, and discovered a number of insects fed on the plants and kept them from getting out of control. They figured perhaps some of these insects would work in North America as well. So they started testing them to see, for example, if they used other plants besides purple loosestrife for food or at any stage in their development from egg to adult. This testing went on for years, because the last thing anyone wanted was to bring an insect into the U.S. to control purple loosestrife and discover that –- oops! -- it also had a taste for soybeans or tomatoes.

Eventually, several species of insects were found that damaged loosestrife but didn't present a problem to other plant species. One of these, *Galerucella calmariensis*, the black-lined loosestrife beetle, is the one we raise at the DRM. This beetle is about a quarter-inch long, brown, and has darker lines along the outside edges of its body. It doesn't bite humans. All it wants to do is eat purple loosestrife, mate, and lay eggs. The adult beetles feed on the leaves of loosestrife plants. They lay clusters of tiny whitish eggs on the stems and leaves, which hatch in about two weeks into tiny yellow caterpillars (larvae) that begin to feed on the leaves and flower buds. The beetles reproduce at a rate of about 100 to one, so when the eggs hatch, the larvae can do a lot of damage to the loosestrife plants. By the time they reach full size (about 5/16 inch) they can reduce the plants to shriveled brown skeletons. The plants can't make and store as much food in their roots as usual, and over the course of a few years, many die. Larval feeding on flower buds reduces the number of seeds produced, so fewer new plants sprout.

Biological control is not the answer to every weed problem. Only a few species of insects have "made the cut" and been approved by the U.S. Department of Agriculture-Animal and Plant Health Inspection Service for use. No bio-control agents have been found for most invasive plants. However for some, such as purple loosestrife, bio-control works very well and is a state-of-the-art component in an integrated weed management plan, which combines biological control, chemical control, and manual techniques. The insects we use have been rigorously tested, are widely-used across North America, and are no more likely to change their eating habits than are



milkweed-eating monarch butterfly larvae. Biological control is also better for the environment, because it reduces the use of herbicides.

If you would like more information about biological control or invasive species, please feel free to contact me at the DRM. During summer, stop by and visit the greenhouse insect-rearing facility. We'd be happy to give you a tour!■

Shoreland Education Materials Available

Looking for some new material to adapt for your newsletter, use at an annual meeting, or share to improve shoreland management? There are many, easy-to-access educational resources available through the shoreland education program.

Electronic

www.shoreland–management.org - includes basic fact sheets, technical background information, and archives of *From Shore to Shore* to use for newsletter articles or handouts. Resources on this web site are not copyrighted, but please cite the source and don't revise the text.

www.extension.umn.edu/water/shore/ - provides dates, locations, agendas, and online registration for our shoreland workshops. You can also learn more about the shoreland education program.

Info-U - 1-800-525-8636 or www.extension.umn.edu/info-u has hundreds of recorded messages and online scripts that you can print out, including many about water resource issues.

Video

Keeping Our Shores introduces best management practices that property owners can use to protect water quality. VH-06947-WRC. $15.

The Living Shore reviews the benefits of shoreland vegetation and introduces shoreline restoration. VH-07129-WRC. $15.

Standing Firm Against Erosion explains why erosion occurs and demonstrates shoreline stabilization techniques. VH-07130-WRC. $15.

Rivers: Ribbons on Life illustrates the importance of sound land management practices and informed decision-making. VH-07542-WRC. $10.

Water Conservation stressed the economic savings, improved wastewater management, and reduction in chemical use that results from household water conservation. VH-6948-WRC. $15.

Septic Systems Revealed describes the basics of septic systems, and features tips for homeowner operation and maintenance. VH-06768-WRC. $15.

Print

Shoreland Landscaping Series includes four publications compiled as a guide to natural landscaping and shoreline revegetation. PC-07357-WRC. $5.

Protecting Our Waters is a packet of 18 publications explaining easy and inexpensive BMPs that shoreland property owners can adopt to protect water quality. MI-06946-WRC. $10.

Turfgrass Management for Protecting Surface Water Quality provides in-depth information on turf management practices, including the use of fertilizer and pesticides. BU-05726-WRC. $4.

Managing Aquatic Plants in Minnesota Lakes identifies invasive exotic plants and describes control options, including preventative approaches. FO-06955-WRC. $2.

Septic System Owners Guide is a fully illustrated guide that includes information on safety, use and operation, maintenance and trouble shooting. PC-06583-WRC. $4.

Video and print products are available from the University of Minnesota Extension Service. To order, call 1-800-876-8636. Credit cards are accepted. You can also order online at www.extension.umn.edu.■

Transparency, Turbidity, or Total Suspended Sediments - What should you measure?

Submitted by: Barb Liukkonen, Water Resources Center, liukk001@umn.edu, 612-625-9256

Those three terms are often used interchangeably, which is incorrect. They don't mean the same thing, although they are closely related. Here's a quick guide to understanding what these parameters are telling you about water clarity.

Transparency is a measure of how well light passes through the water column. Transparency is usually measured with a Secchi disk (for lakes) or transparency tube (for streams), although it can be measured in the field with a light meter. Secchi disk readings are probably the most commonly collected water quality data across the U.S. Transparency measurements are typically made *in situ* (on site) and can be affected by suspended sediment, algae, and water color (i.e., humic acids that stain the water red or brown).

Turbidity is a measure of the how much light is scattered by particles in the water. It is reported in NTUs (Nephelometric Turbidity Units) and is measured with a nephelometer, which may cost several hundred dollars. Turbidity measurements can be made *in situ* with a meter or back in the lab. Algae blooms or suspended sediment can increase turbidity because light is scattered by particles in the water, whether those particles are sediment or algae.

Total Suspended Solids (TSS) is a direct measurement of the particles suspended in the water - by weight. That means you must collect a sample and take it back to the lab where the water is filtered and dried in an oven, before being weighed. Sediment weighs more than algae, so TSS is a more accurate measurement of how much sediment is in the water, whereas turbidity is affected equally by sediment or algae.

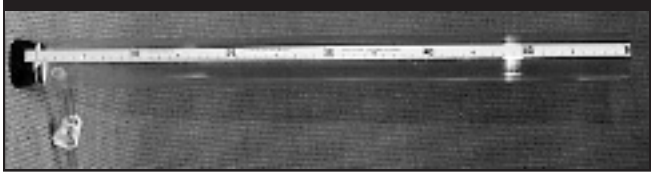
If you collect samples for turbidity or TSS, be sure to shake the container thoroughly before taking a measurement, so whatever has settled out is re-suspended. Neither TSS or turbidity measurements are affected by colored water.

TSS and turbidity are inversely correlated with transparency. That means that as turbidity or TSS increases, transparency decreases (more stuff in the water translates to reduced light penetration).

A secchi disk is used to measure water clarity.

Thanks to committed volunteers we're building an extensive database for transparency across Minnesota. Those data can be used to establish long-term trends or to identify significant changes in water clarity. Most volunteers will continue to gather important transparency data with their trusty Secchi disk, but if you want to know more about the cause of reduced transparency, you might want to sample for turbidity or TSS. ■

Transparency Tube



Shore to Shore is made possible by Minnesota Sea Grant, in cooperation with the University of Minnesota Water Resources Center.