From Shore to Shore

"For Minnesota citizens promoting the health of our rivers and lakes"

Newsletter 51
September 2003

Calendar of Events

Funding & Grant Opportunities For Lake Associations.

October 14, 7 - 9 pm
Warner Lake Nature Center
Clearwater

An evening featuring:

- Paula West of the Minnesota Lakes Association on possible funding sources for lake associations, including lake improvement districts.
- Don Hickman, Initiative Foundation, sharing tips from a funder's perspective on preparing successful grant proposals.
- A representative from the Board of Soil and Water Resources speaking about Challenge Grants.

(The September date was cancelled due to scheduling conflicts.)

Please RSVP your attendance to Missy at 800-433-5236 or 763-241-2720 by October 10.

Successful 2003 Aquatic Plant Identification Workshops

Submitted by: Eleanor Burkett, Regional Extension Educator

In the summer of 2003, the University of Minnesota Extension Service Shoreland Education Program held three Aquatic Plant Identification workshops across the state. Locations included Rush City, Clinton, and Crosslake. The sessions filled to capacity with aquatic plant enthusiasts and first-timers. The workshops included a segment on aquatic plants and how to use the plant identification manual, which was included with the workshop. At this session, participants were able try their luck on plant identification using dry herbarium plant specimens before the second session which was the real thing - to the lakes to collect aquatic plants and return ashore to key the plants for identification and learn how to properly label, mount and press plant specimens.

Keying out plants

Collecting aquatic plants among the water lilies

While future aquatic plant identification workshops will be offered, additional workshops are being planned for wetland and upland plant identification. Watch for information on all upcoming Shoreland Education Programs for 2004 in *From Shore to Shore*.

Preparing herbarium specimens

Need Trees and Shrubs for Your 2004 Projects?

If you are planning a shoreland landscape project for next spring, you may want to consider the MN DNR for plant materials. MN DNR sells tree seedlings on their website and has other information including: Reasons to Plant Trees, Trees for all Seasons, Right Tree for the Right Situation, Choosing the Right Trees, Tree Seedling Price List and Tree Ordering forms. Their website is www.dnr.state.mn.us/forestry/nurseries. You may also receive the information by contacting Annette Anderson at (218) 372-3183.

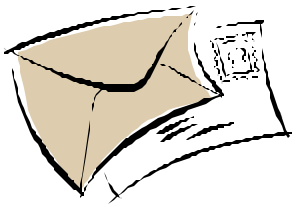
Another resource for plants is your local Soil and Water Conservation District (SWCD). They sell trees and shrubs, and some sell native plant materials. The tree and shrub plants come bare root in bundles of 25 and usually cost less than $1.00 a piece. In some counties, bundles of a variety of five trees and shrubs may be available. Contact your local SWCD office to find the nearest location that participates in spring plant sales and plant material availability lists.

Shoreland Habitat Program
MN Department of Natural Resources
Grant Announcement 2003 – 04

The Department of Natural Resources, Division of Fisheries' Shoreland Habitat Program is announcing a request for proposals for Shoreland Habitat Grants to protect and restore native shorelands. Projects must be in the fiscal years of 2004 and 2005. A 25 percent match is required, with a minimum of $1,000.00 cash match. Application deadline is September 30, 2003. For more information, contact Kevin Bigalke, Shoreland Habitat Coordinator at (651) 296-2548 or the Aquatic Plant Restoration Specialist at your regional DNR office.

Your submissions are welcome!

Readers of *From Shore to Shore* are invited to submit articles, pictures and stories about shoreland or water quality. Share your experiences and ideas with others across the state! Tell us about a project you are working on, send a photo of a project you are proud of (digital or print) or submit a suggestion for an article topic. For submissions, please send materials to Barb Liukkonen, Water Resources Center, 173 McNeal Hall, 1985 Buford Avenue, St. Paul, MN 55108 or email Barb at liukk001@umn.edu.



Census of Minnesota Lake Water Clarity - Using Satellite Imaging

Submitted by: Barb Liukkonen, Water Resources Education Coordinator, University of Minnesota Water Resources Center

Water clarity is a common indicator of water quality, recreational suitability and aesthetics. Citizen volunteers and agency staff regularly use Secchi disks to measure water clarity. However, with over 10,000 lakes in Minnesota, many of which aren't easily accessible, many lakes are not monitored.

New technology and new interpretive tools allow researchers to use satellite images to assess water clarity for over 10,500 Minnesota lakes. The Landsat satellite orbits north to south and acquires images that are about 100 miles on each side. Sensors record reflected light and infrared energy as digital images. Analysts use these images to separate water features from land, and measure the intensity of reflected blue and red wavelengths from each lake. These measurements are calibrated with Secchi disk readings. Once a mathematical relationship is determined from 20-40 lakes, the clarity of all the lakes on a single Landsat image can be computed.

Lake clarity is affected primarily by three different constituents in the water: 1) algae suspended in the water column; 2) suspended sediment; or 3) dissolved natural organic matter, derived from the partial decay of terrestrial plants. The cause of the "iced-tea" color in these lakes is often referred to as "tannic acid" or tannins. A more correct term is "humic materials," but the result is the same – tea-colored water. They are common in northern Minnesota where there is forested watershed with many bogs and wetlands, and are usually low in nutrients with little suspended sediment or algae.

A map showing Minnesota lake water clarity has been developed, and will be available within a couple months, as either a 3' x 4' poster or an 8 ½" x 11" fact sheet. Using a color scale, the map clearly illustrates differences in water clarity across the state, between ecoregions. When the map is available, we'll let you know how you can get a copy.

Meanwhile, you can visit a web site (under construction) that will have a PDF of the map and lots of information about water clarity and satellite imagery. And to learn more about the clarity of your favorite lake. The web site is: www.water.umn.edu

The satellite imaging work was carried out by the University of Minnesota Remote Sensing and Geospatial Lab with support from NASA. The poster was developed as a collaboration between researchers and staff at the University of Minnesota Remote Sensing Lab and Water Resources Center, DNR, PCA, Met Council and the Science Museum of Minnesota.

LEARNING ABOUT YOUR LAKE: ALGAE AND AQUATIC PLANTS

Submitted by: Cindy Hagley, Great Lakes Environmental Quality Educator, University of Minnesota Sea Grant

One of the biggest questions resource managers are getting this summer is, "Why are there so many aquatic plants on my lake this year?" Callers want to know what has changed about their lake and wonder whether they need to invest in an aquatic plant management program.

HOLD ON A MINUTE! Don't buy that mechanical harvester or invest in herbicides yet. Let's take a look at some of the factors that determine aquatic plant and algae populations in a lake and how they change from year to year. Understanding these factors requires understanding a little bit about your lake's productivity. Primary productivity is the rate at which algae and aquatic plants convert light energy into plant matter. When we talk about a lake's primary productivity, we are talking about how prolific a population of plants is and the algae it supports. A lake choked with plants or algae is highly productive, while a pristine, clear lake, like many of our northern Minnesota lakes, is considered unproductive.

Lake productivity, and the values and beauty we ascribe to the lake, are largely determined by the supply of nutrients the lake receives. The lakes and bays where aquatic plants or algae can become dense and troublesome are usually nutrient-rich. They are also often relatively shallow.

(Continued on page 4)

(Continued from page 3)

LEARNING ABOUT YOUR LAKE: ALGAE AND AQUATIC PLANTS

Although aquatic plants can grow in much lower light conditions than plants on land (up to 95 percent less light), lack of light still limits their maximum depth. If you live on a lake that receives a lot of nutrients from its watershed either because of how the land surrounding the lake is managed or because of natural sources, and your lake or bay is relatively shallow it is at risk of becoming dominated by either algal blooms or aquatic plants.

This Secchi disk is barely visible just a few feet below the surface because of the dense algae growth in the water.

So what should you do if your lake is choked with "weeds" this year? The first thing to consider is what factors might be influencing the natural variability of the plants, such as climate and lake levels. Determine if the climate over the last year been different than normal. For example, low snowfall winters can allow light to penetrate the lake throughout the winter, letting many species of aquatic plants continue to photosynthesize. This process gives them a head start the following summer. Are lake levels significantly lower or higher than average? For example, low lake levels can allow aquatic plants to colonize deeper areas of the lake than normal.

The second thing to consider is whether anything significant has changed in terms of land uses around the lake. For example, is there significant construction taking place in the watershed that could be introducing large quantities of nutrients to the lake?

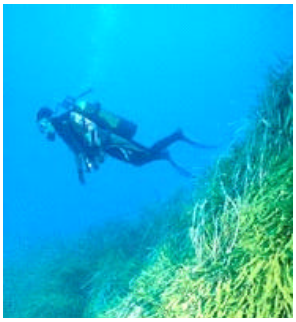
Determining whether the changes in plant density are natural fluctuations, or whether they are caused by changes in lake management, will help determine what to do. Often the best answer is to simply wait it out. If you do consider aquatic plant removal by one means or another, it is important to understand the possible consequences of your choice.

Shallow, productive lakes or bays are often delicately balanced ecosystems. Research has shown the balance between aquatic plant dominance and algae dominance can shift very quickly and once a lake shifts to an algae dominated state, it is very difficult to return it to aquatic plants. If given a choice, most people would prefer their cabin to be located on a lake with healthy aquatic plant populations rather than a lake where dense blooms of algae have turned the lake pea soup green and has shaded out the plants.

What can make a lake shift from dominance by plants to dominance by algae? Research shows a clear relationship between increased nutrients and increased algae in the water and, at first, increased plant growth. Soon the plants disappear through leaving the system dominated by algae. This complicated relationship will have to be the subject of a future article, BUT you should know this: Research shows other factors can cause lakes to shift to algal dominance, such as: mechanical harvester or boat damage to plants, herbicides, pesticides or grazing on plants by exotic fish, such as carp*. In other words, the very choices you might make to control plants might drive the lake to a much less desirable state – algal soup!

What does all this mean to you, as you struggle to find a path for your boat through the plants in your lake? Before you treat the symptoms (which are quite likely temporary), CONSIDER AND CONTROL the underlying causes (excess nutrients entering your lake).

*Moss, B., J. Madgwick, and G. Phillips. 1996. A guide to the restoration of nutrient-enriched shallow lakes. WW Hawes, UK. 180 pp.



Lakes dominated by aquatic plants tend to have clear water and low algal populations.

Sea Grant Minnesota
Water Resources Center
University of Minnesota Extension Service