

From Shore to Shore

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

Newsletter 49
July 2003

Calendar of Events

Aquatic Plant ID Workshop

July 19 ~ 8:30 am - 4:30 pm
Bonanza Education Center
Ortonville
Contact Amy Rager at 320-669-4471

Control of Algae

July 29 ~ 7:00pm
Warner Lake Nature Center,
Clearwater
Featuring Julie Klocker, Sauk River
Watershed District

Please RSVP to Missy at
800-433-5236 or 763-241-2720

One-Day Shoreland Revegetation Workshop

August 22 ~ 9:00am - 3:00pm
Crosslake
Contact Eleanor Burkett at
218-587-8280



Cindy Hagley of Sea Grant, helping Jim Diede of Pokegama Lake learn about water sampling techniques in the lake ecology session.

Shoreland Volunteer Training

By: Julie Miedtke, Extension Educator

A weekend in late April found a small group of people gathered along the tranquil shores of Bluewater Lake, north of Grand Rapids. The setting at Camp Bluewater was ideal, the ice was off the lake, the weather was glorious and a pair of loons had arrived home to this pristine water in the heart of the Chippewa National Forest. Truly an inspirational setting for the 25 citizens, representing 17 different lakes, ready to learn about water resources and to become a Shoreland Volunteer.

The Shoreland Volunteer training is offered five times in locations throughout the state of Minnesota, to provide information, practical experience and resources for people interested in promoting Shoreland stewardship.

Instructors are from Sea Grant, the University of Minnesota's Water Resources Center, Minnesota DNR, the Itasca Soil and Water Conservation District, Itasca Coalition of Lake Associations (ICOLA) and the University of Minnesota Extension Service.

Volunteers learned from resource professionals about:

- Lake and river ecology
- Managing shoreland in ways that monitor lakes & rivers health
- Water quality monitoring
- Detecting exotic species
- Restoring degraded shorelines
- How to share their knowledge with others

Following the training, Shoreland Volunteers agreed to give 20 hours of community service. To help with this summer's activities, Stephanie Kessler (yes! She is Aaron Alto's sister) has agreed to help coordinate the volunteers, and will be sponsored by the Itasca Coalition of Lake Associations and the Soil and Water Conservation District.

For more information about the Shoreland Volunteer program in the Grand Rapids area or if you are interested in other water resource workshops, please contact Julie Miedtke at 218-327-4177 or miedt001@umn.edu.

Remember that little yellow post card that came with your June issue of *From Shore to Shore*?

This is a friendly reminder to fill it out and return it as soon as possible! If you can't find it please email Mary Blickenderfer at blick002@umn.edu. If you don't have email you may call Ron Struss at (651) 215 - 1950 with the following information:

Your name, address, email address and preference in getting your *From Shore to Shore* newsletter:

1. Via internet;
2. US Postal; or
3. No longer wish to receive the newsletter

We are working at getting our mail list updated and will soon have *From Shore to Shore* on the web, so time is of the essence!

Thank you!

The "500 lbs. Algae Adage" – where did it come from?

By: Ron Struss,
University of Minnesota Extension Educator

Have you heard this adage?: *One pound of phosphorus can produce from 300 to 500 pounds of algae.* You probably have. It is much quoted in articles and during presentations when the "greening" of lakes is discussed. It means a pound of the nutrient phosphorus entering a lake (or river) from wastewater or stormwater runoff can promote the growth of up to 500 pounds of "pea soup" algae.

Not only have I heard this adage, I have repeated it to others - which led me to ask, *where did it come from, and is it TRUE?*

Steve Heiskary, limnologist with the Minnesota Pollution Control Agency, put me on the trail of the "algae adage" origins by directing me to *Limnology*, a standard textbook by Robert G. Wetzel. While it is not known who first coined the adage, the rationale for it is laid out in a section titled *Effects of Phosphorus Concentration on Lake Productivity* (Second Edition, page 285). A main reference for the section is J.R. Vallentyne's book *The Algal Bowl – Lakes and Man* (Ottawa Department of the Environment, 1974).

Core to the rationale is the "law of the minimum", that is, the nutrient that is in the shortest supply in relation to a plant's needs will control the growth of that plant. The "law of the minimum" can be illustrated using a baking example:

A pound cake takes a pound of flour, a pound of butter, a pound of sugar and four eggs. If you have ten pounds of flour, butter, and sugar, but only four eggs, you can only bake one pound cake. The eggs are the limiting factor to baking more.

The limiting factor for algae growth in most Minnesota lakes is the nutrient phosphorus. It is not limiting because algae need so much of it, but rather because it is usually in very short supply. The average ratio of the phosphorus needs of algae to what is available in water is 80,000 to 1.

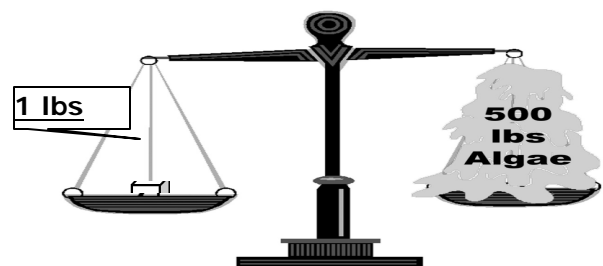
According to J.R. Vallentyne, a 500 pound "batch" of wet algae requires:

- 1 pound phosphorus
- 7 pounds nitrogen
- 40 pounds carbon

Since there is usually more than adequate levels of nitrogen and carbon in lake and river water, for every pound of phosphorus added, another 500 pound batch of wet algae can be produced. Since 500 pounds is the theoretical maximum that can be produced, the range of 300 to 500 pounds is typically used when the adage is quoted. I did not find how the 300 pound lower limit was set – it is likely the best estimate of the specialist who first coined the adage. The 300 pound to 500 pound range is wet weight algae; in dry weight the range is 60 to 100 pounds.

All types of algae can experience periods of rapid growth known as "blooms". In Minnesota lakes, however, blooms of blue green algae, also known as cyanobacteria, draw the most notice. They form surface scum, are smelly, and occasionally produce toxins harmful to drinking livestock and pets.

Blooms of blue green algae are a classic case of too much of a good thing. We owe lots to blue green algae for both past and present good. Similar to bacteria in structure, these simple organisms are credited for first using chlorophyll to make food from sunlight and for boosting oxygen in the Earth's early atmosphere. In lakes today they form the base of the food web that feeds increasing larger and larger animals - including you if you were lucky enough to hook a lunker this season!



Anglers to Swap Out Lead Tackle this Summer

By: Roland Sigurdson, Water Resource Center

The Minnesota Office of Environmental Assistance (OEA) and the Department of Natural Resources (DNR) are partnering with retailers, conservation, and outdoor groups to offer lead tackle exchanges across the state this summer. Over 17 lead tackle exchange events are scheduled beginning this month. Anglers can bring lead sinkers and jigs to the event to trade for non-lead ones.

"We want to offer anglers throughout Minnesota the chance to try out and compare non-lead tackle made from metals such as bitzsmith, tin, and stainless steel," said Kevin McDonald, coordinator of the OEA's non-lead tackle program.

Lead is a toxic metal that has adverse effects on the nervous and reproductive systems of mammals and birds. Found in most fishing jigs and sinkers, this metal is poisoning wildlife such as loons and eagles.

Carrol Henderson, supervisor of the DNR's Nongame Wildlife Program, is enthusiastic about the lead exchange program. "This is an excellent opportunity for people who care about wildlife to cooperate with the fishing tackle industry and reduce the amount of lead being deposited in Minnesota's lakes."

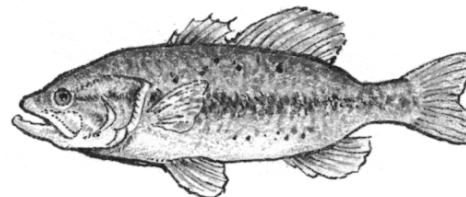
Schedule of Exchanges: For updates, visit <http://www.moea.state.mn.us/reduce/sinkers.cfm>

- * Fri., July 11, 2 p.m. to 7 p.m.
Gander Mountain - Rochester
- * Fri., July 11, 2 p.m. to 7 p.m.
Gander Mountain - Duluth
- * Fri., July 11, 2 p.m. to 7 p.m.
Gander Mountain - Fridley
- * Wed.-Thurs., July 16-17, 3 p.m. to 6 p.m.,
Joe's Sporting Goods, 935 N. Dale Street,
St. Paul
- * Fri., July 18, 2 p.m. to 7 p.m.
Gander Mountain - Burnsville
- * Fri., July 18, 2 p.m. to 7 p.m.
Gander Mountain - Bemidji
- * Sat., July 19, 10 a.m. to noon Lake Mary
Assoc, Kensington Runestone County Park
Douglas Co.
- * Fri., July 25, 2 p.m. to 7 p.m.
Gander Mountain - Minnetonka
- * Fri., July 25, 2 p.m. to 7 p.m.
Gander Mountain - St. Cloud
- * Fri.-Sat., August 1-2, 11 a.m. to 4 p.m.
Upper Mississippi National Wildlife Refuge
Celebrating a Century of Conservation at
Eagle Days -Wabasha
- * Fri., August 1, 2 p.m. to 7 p.m.
Gander Mountain - Maple Grove
- * Fri., August 8, 2 p.m. to 7 p.m.
Gander Mountain - Woodbury
- * Sat., August 9, 10 a.m. to 5 p.m.
Dakota County Fair Grounds, Farmington
- * Fri., August 15, 2 p.m. to 7 p.m.
Gander Mountain - Bloomington
- * Sat., August 16, noon to 2 p.m.
Marion Lake Association, Lions Club
Shelter - Dent

In this session, the Legislature considered banning the sale and use of lead tackle. But after a series of stakeholder discussions, the groups involved agreed that a better approach was to educate anglers about the alternatives to lead tackle and to offer opportunities to try out non-lead sinkers and jigs.

Along with the OEA and DNR, other partners in this summer's lead tackle exchanges include Audubon Minnesota, Cabela's, Duluth Audubon, Gander Mountain, Duluth Chapter of the Izaak Walton League, Joe's Sporting Goods, Minnesota Lakes Association and several individual lake associations, National Eagle Center, and Voyageurs National Park Association.

Minnesota Office of Environmental Assistance is a state agency dedicated to protecting Minnesota's environment and assuring a sustainable economy through waste prevention and resource conservation.



largemouth bass

Native Seed Collection

By: Mary Blickenderfer, Extension Educator

One good source of plant material for shoreland restoration projects is hand-collected seed from local native stands. Hand-collected seeds may be broadcast directly at a restoration site, or plants grown from the seed may be used. Plants produced from locally collected seed will be adapted to local site conditions. In addition, native seed collecting is a great way to increase one's native plant repertoire and become familiar with the ecology of a plant – under what soil-sun-moisture conditions it grows, what other plants are naturally associated with it, whether it occurs in small patches (“accent plant”) or in large beds (“matrix plant”), when it blooms, its height, etc.

Before you collect...

- 1) Know the plant species you're collecting. Don't collect aggressive species that may cause problems later. Also, make sure the species is not listed as “threatened” or “endangered” or on the state/federal list of “noxious weeds.”
- 2) Obtain permission to collect seed if not on your own private property.
- 3) Consider marking the plants while they are at a stage that they can be most easily identified. For flowers, this will be when they are in bloom. For grasses and sedges, this will be when they set seed. This will facilitate accurate identification and ease of locating them during collection later in the season.
- 4) Select only large populations of plants for collecting.
- 5) Monitor these plants as they mature, testing the seed for ripeness. To test seed, press a kernel between your thumbnail and finger. Seed kernels will go through several stages before they are ready to collect: first *milky juice*, “*soft dough*” (like soft bread dough), “*hard dough*” (like stiff cookie dough), and finally *firm* (hard to the touch). Seed is ready to harvest when *firm*.

Collecting seed...

When collecting seed make sure you bring paper bags for the “dry” seed (e.g., grass, aster, bergamot) and/or plastic bags for the “wet” seed (e.g., Jack-in-the-pulpit, Solomon's seal and other seed surrounded by pulp or seed that needs to remain moist to maintain viability), marking pen, scissors or pruners, and a pack to carry these items.

Collect seed according to the “1/3 Rule” (i.e. collect no more than 1/3 of the seeds from 1/3 of the seed heads of 1/3 of the plants in any given population). Cut, prune, or hand-strip seed heads, placing the seed in a bag. Be sure to label each bag with the following information: *date*, *state* (if collecting in more than one), *county*, *specific location* (lake, nearest city, etc.), *plant name or identifying #* (be sure the label includes the complete scientific name, even if you have to look it up and add it after returning home), *collector*, and *other notes* (about quality of seed, insect damage, unusual growing season or site information, etc. – as necessary).

After you collect seed...

A general rule for flower species with **seeds that reach maturity in early summer – June or July** (e.g., trillium, bellwort, bloodroot, violets, marsh marigold, Canada anemone) is to plant the seeds *immediately* in soil and keep watered through the growing season. This will maintain their viability and fulfill the first stage of the requirements for breaking dormancy. Note that trillium, bellwort, bloodroot, and violet seed have a fatty appendage called an “eliasome.” Ants carry these seeds into their anthills where they eat only the high-nutrient eliasome and inadvertently plant the seeds.

For most grasses and **seeds that reach maturity in late summer and fall**, hang bags of “dry” seed in a warm, dry place to thoroughly dry, stirring seeds occasionally. Keep bags of “pulpy” seed at room temperature until you are ready to clean. If they start fermenting, refrigerate until ready to clean. Seed cleaning, storing, and growing techniques will be covered in upcoming issues of this newsletter. Beware - seed collecting can be addicting!

Reference: Baskin, C. and J. Baskin. 1998. *Seeds – Ecology, Biogeography, and Evolution of Dormancy and Germination*. Academic Press:London. 666 pp.

