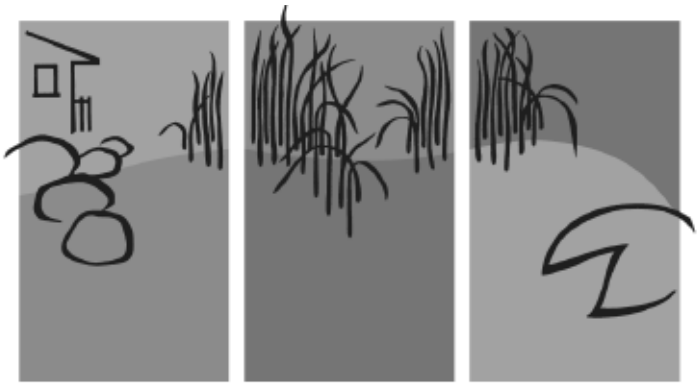


From Shore to Shore

For Minnesota citizens promoting the health of our rivers & lakes

November-December 2005

#70

Calendar of Events

→ Brainerd Area Environmental Learning Network – Alternative and Cluster Septic System Alternatives

November 17, 2005 – Baxter, MN – Pollution Control Agency

Contact: Eleanor Burkett, burke044@umn.edu

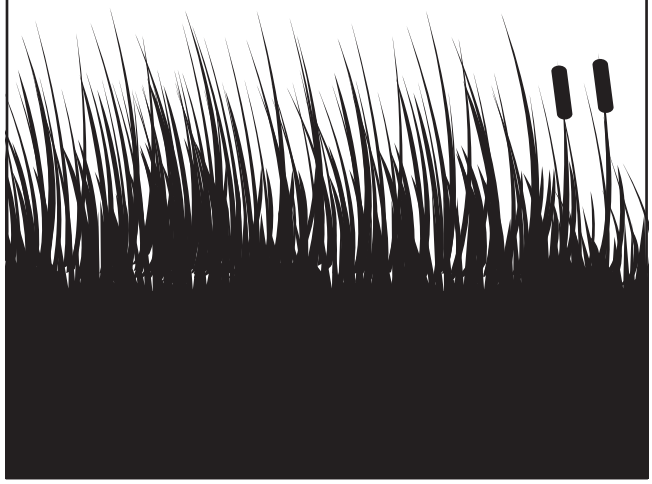
→ Brainerd Area Environmental Learning Network – Camp Ripley Environmental Programs

December 15, 2005 – Baxter, MN – Pollution Control Agency

Contact: Eleanor Burkett, burke044@umn.edu

→ Lakes and Rivers Conference

September 7-9, 2006 – Mark your calendars now and watch these pages for more information.



Master Gardener State Conference

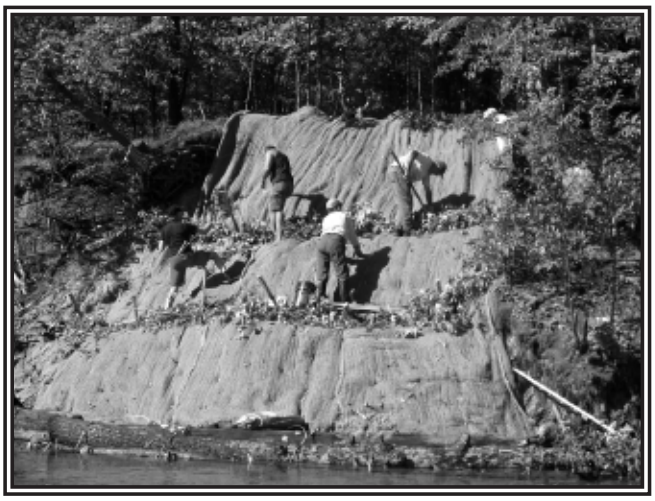
The 2005 State Master Gardener Conference was held in Brainerd on September 16-17. Three tours highlighting local efforts were offered as part of the conference. Extension Educator Jackie Froeming from Crow Wing County participated in the "Waterside Wonders of Crow Wing County," a tour that spotlighted four properties where shorelines have been restored. ■

Rush Lake Erosion Research – *Part one of two*

Mary Blickenderfer, University of Minnesota Extension Service, 888-241-0885, blick002@umn.edu

For decades, lakeshore owners and boaters on Rush Lake (part of the Whitefish Chain north of Brainerd) have viewed the steep, sandy, eroding banks of County and DNR Islands. Past efforts to stabilize these banks have been partially successful, but the erosion continued.

This summer, people on Rush Lake were greeted with a curious sight. The islands' steep slopes resembled a patchwork quilt of colors and logs nestled along the shorelines. The islands had become research sites, testing the effectiveness of several erosion control methods. Combining the successes of past erosion control efforts with new technology and techniques, several state and local agencies, organizations, and businesses coordinated and established this research project.



Slope Stabilization

The goal for stabilizing the upland slope area is to establish deep-rooted, drought-tolerant, native plants. To facilitate installation (every footstep generates a small landslide of sand) and create a favorable growing environment for the plants, bio-terraces were installed by anchoring several brush bundles along the slope. Native grass seed, flower seedlings, and bare root shrub and tree seedlings were planted. Four types of protective layers were also applied to the soil surface to minimize slope erosion and to hold moisture for the plants during establishment: one layer of coconut fiber blanket, two layers of coconut fiber blanket, Futera – a blanket of wood fiber material, and hydro-mulch – a fiber slurry mixed with the native seed and sprayed on the slope. The table below summarizes the cost and first-year plant establishment success for each of the four trials of protective layers.

During this initial year, Rush Lake Association members watered the site during periods of drought, aiding establishment of the plants. Sixty percent of the bare-root seedlings established well. While the success of the native flower planting was evident, it is too early to comment on the success of the native grass seeding as very little growth is visible above ground the first year. Much of the plant cover on each plot at the end of this season consisted of annual weeds, native perennials that were not planted, and a few survivors of past planting efforts. A complete report of the project and subsequent updates can be found at www.extension.umn.edu/shoreland beginning January 2006. ■

Major Contributors

Rush Lake Association, Whitefish Area Property Owners Association, Crow Wing Soil and Water Conservation District, and University of Minnesota Extension Service, with significant financial support and contributions from the Minnesota Department of Natural Resources Shoreland Habitat Program, Pequot Sand and Gravel, Professional Lake Management, and Lakeside Lawn and Landscape Company.

Trial (each 600 sq. ft.)	Blanket & Bioterrace	Native Grass Seed (1#)	Native Flower Seedlings (45)	Percent Cover	Flower Survival
1 coco blanket	$174	$14	$158	33%	90%
2 coco blankets	$399	$14	$158	13%	64%
Futera blanket	$ 96	$14	$158	45%	57%
Hydromulch	$425	$14	$158	38%	64%

Protect Your Septic System From Freezing

Valerie Prax, University of Minnesota Extension Service, 320-225-5054, malmq002@umn.edu

With fall upon us, it is time to think about how to protect your septic system from freezing this winter.

The most common reason septic systems freeze are a lack of snow cover and cold temperatures, combined with construction or "use" issues. These can include a waterlogged system, cold air entering the system, compacted soil, or lack of plant cover. Others include irregular use of the system, leaking plumbing fixtures or a pipe that's not installed with the proper change of elevation. If the soil over a pipe is compacted, the elevation of the pipe may shift, causing a loss of gravity flow. This results in water left standing in pipes, which can freeze easily.

If your system freezes, you should contact a professional sewage pumper or installer who can help determine the cause of the problem and offer solutions. The University of Minnesota Onsite Sewage Program Web site at http://septic.umn.edu/homeowner/index.html has detailed information on septic system freezing problems. It can also help you locate a professional in your area.

There are many things you can do to reduce the chances of your system freezing this winter. Here are some precautions if you think you may have a problem.

• Add a layer of mulch (8-12 inches) over the pipes, tank, and soil treatment area to provide insulation. A mulch of loose hay or straw works well, as do leaves. The key is to keep it loose to form air pockets, which act as the insulators. This is particularly important if your system is new, and vegetative cover has not been well established.

• Use normal amounts of water; the warmer the better. Spread out your laundry schedule to one warm/hot load per day, a pattern that should be followed year-round. *DO NOT leave water running all the time, this will hydraulically overload the system. DO NOT add antifreeze to the system.

• If you plan to be gone for more than a day or two, plan accordingly. Have someone visit and use water regularly. If you are going to be gone for an extended period (weeks or months), your best option may to be pump your tank before leaving.

• Fix any leaky plumbing in your home. The small trickles of water going into the system can freeze as thin ice layers within pipes, and eventually close them. If you have a high-efficiency furnace, collect the water in a large container, emptying onto the ground periodically. This does not need to go into your septic system - it is clean water.

• Keep all types of vehicles -- including ATVs and snowmobiles -- and high-traffic people activities off the system. This is a good rule to follow all year. Mound systems are not 4-wheeler jumps!

• Make sure all risers, inspection pipes, and manholes have covers. Adding insulation is a good idea.

• Keep an eye on your system. If any seeping or ponding occurs, contact an onsite professional to help determine the cause and remedy.

For more information about proper operation of septic systems, see our Web site at: http://septic.umn.edu/. ■

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I should tell you these are in fact inhabitants of Minnesota lakes. Perhaps it's a good thing that winter is nearly here; that way you may be able shake off the hee-bee-gee-bees before going for a swim next summer. Just remember when you step into that cool water, you are not alone…. ■

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The Creepy-Crawlies of Lakes and Rivers: The Importance of What Lies Beneath the Water's Surface

Emily Wolf, former Regional Extension Educator, currently a high school science teacher in Osakis, MN

Picture from Montz, G. 2004. Healthy Rivers: A Water Course CD. Minnesota Department of Natural Resources.

What is it? A shriveled shrimp? An alien life-form? A vital part of the aquatic food web? The answer of course is the last one, a vital part of the aquatic food web. Macroinvertebrates, such as the sideswimmer pictured here, are small animals without backbones, just visible to the naked eye. These creatures are key in sustaining the quality of surface waters in Minnesota.

Why are they important? Macroinvertebrates are good indicators of pollution levels due to their relatively long life spans and functional roles in aquatic food webs. They provide better insight into aquatic ecosystem health than traditional water chemistry measures because they integrate the effects of disturbances or pollution over time. Studies have shown benthos to be useful in water quality assessment due to their diversity, wide distribution, and varying tolerances to pollution.

Water quality affects macroinvertebrates both directly and indirectly. Most species of mayflies typically do not tolerate acidic conditions, while other insects, such as caddis flies, are less sensitive. Amphipods, such as the sideswimmers mentioned earlier, are known to be negatively affected by increases in salinity (salt concentration), and decreases in pH. Deviations from normal patterns of reproduction and growth of certain amphipods have been studied as a result of temperature and water level changes. Temperature, dissolved oxygen, and pH can further influence absorption of metals and other pollutants, indirectly impacting organism health. Poor water quality can reduce macroinvertebrate diversity and alter community structure, which causes changes throughout the aquatic ecosystem.

Sensitive Organisms or Tough Bugs?

Using macroinvertebrates in monitoring is not a foolproof measure of water quality. Recent studies suggest that the commonly found macroinvertebrates have become tolerant of environmental disturbances. If you consider Minnesota's history, such as the extensive logging in the late 1800s, the use of waterways as sewage conveyances or worse in the 1900s, and the growing influence of urban runoff, it seems miraculous that anything but the toughest of the tough are left.

Take a closer look at the shoreline. Why do fish and wildlife spend so much time in the nearshore area of lakes and rivers? That's where the food is. Aquatic insects, snails, clams, leeches and other invertebrates are bountiful in the near-shore area among lush vegetation. Imagine the underwater forest-like habitat of submerged and emergent vegetation, filled with swimming, crawling, and burrowing creatures. It's the perfect place to raise a fish with ample food and protection. Preserving this area or re-establishing vegetated buffers provides habitat for these macroinvertebrates, which in turn, serve as food for many species of fish and wildlife.

Macroinvertebrates also play a particularly important role in the "green-ness" of many lakes. Several macroinvertebrates are the herbivores of the water, consuming algae at incredible rates. A healthy macroinvertebrate population in combination with (lower) phosphorus loads is nature's way of controlling algae blooms. Researchers have used this function to our benefit. The herbivores serve as prey for larger macroinvertebrates and fish fry. With this understanding, manipulations of fisheries have been used to alter the numbers of macroinvertebrate herbivores, improving water clarity of some shallow lakes.

The diversity of macroinvertebrates is simply astounding. Have you ever seen a leech with six or eight eyes, or one that was twelve inches long? Or observed the jet propulsion of the small dragonfly nymph? Before you begin to wonder if I'm describing creatures released from Area 51,

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