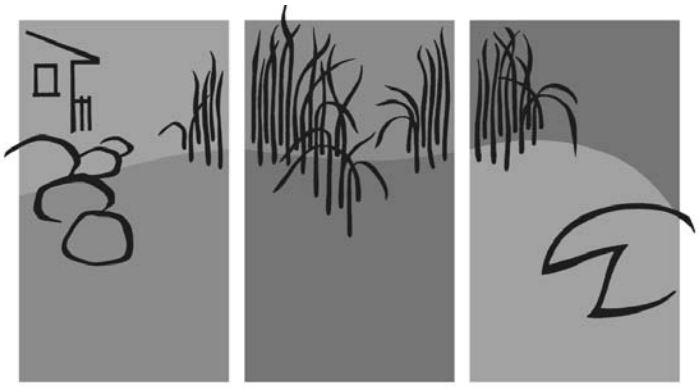


From Shore to Shore

For Minnesota citizens promoting the health of our rivers & lakes

September-October 2006

#75

Calendar of Events

→ The Changing Landscapes of Minnesota's Lakes and Rivers

September 7-9, 2006 – Duluth, MN

For registration and agenda, contact: http:www.minnesotawaters.org/conference06.html

Citizens Test Bacteria Monitoring Kits

Barb Liukkonen, Water Resources Center and Minnesota Sea Grant, 612-625-9256, liukk001@umn.edu

Forty-seven volunteers in Minnesota are collecting water samples from their favorite lake or stream this summer to test for the presence of *E. coli* bacteria. They split the sample they collect and send half to a certified lab for analysis and take the rest home where they analyze it using two simple test kits. Volunteers are monitoring 24 sites on 15 different lakes and rivers in 11 Minnesota counties. So far they've detected a few sites that exceed the state standard for *E. coli* bacteria on a regular basis and a few sites that have been occasionally high. Many volunteers have been pleased to find that the sites they are monitoring have very low bacteria counts and do not present a human health risk for recreational use.

Their work is part of a six-state regional project assessing the accuracy and reliability of those test kits when used by volunteers. The three-year study, funded through the Cooperative State Research, Education, and Extension Service (CSREES) is evaluating six different test kits, including the Coliscan® EasyGel and 3M Petrifilm™ products that Minnesota volunteers are using. The Water Resources Center is the fiscal agent and Barb Liukkonen is coordinating the project. Five other states are in the project: IA, WI, MI, IN, and OH.

The research project team received the 2006 national Gold Team Award from the Association of Natural Resource Extension Professionals at the association's annual conference in Park City, Utah, in May.

Shoreland Education Program Staff Have Been Busy!

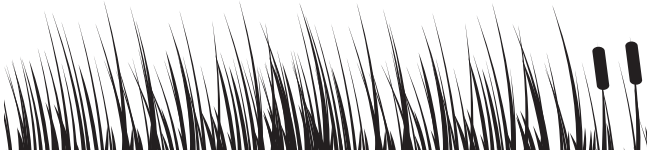
Eleanor Burkett presented a poster *Sustaining Our Shores: New Research, Demonstration and Education Through University of Minnesota Extension Service Shoreland Education Program, Erosion Control for Property Owners* at the Association of Natural Resource Extension Professionals conference held May 14 - 17, 2006, in Park City, Utah.

Barb Liukkonen presented two papers at the same conference: *Does Arsenic in Drinking Water Affect Dairy Products? and Preventing the Spread of Aquatic Invasive Species from Water Gardening.*

Also at the conference, Barb and Eleanor received the national Gold Award for Educational Materials for the posters, tip cards, and plant sticks we produced to prevent the spread of invasive aquatic species from water gardening.

Doug Jensen, aquatic invasive species program coordinator for Minnesota Sea Grant, gave a presentation, *Habitattitude Baseline Survey Shows that Aquarists and Water Gardeners Can Be The Problem and Solution to Aquatic Invasive Species Spread*, at the 14th International Aquatic Invasive Species Conference, in Key Biscayne, Florida, during May.

Doug also gave a presentation, *Habitattitude: A Program Update*, at the Great Lakes Sea Grant Network Conference in Alpena, MI, June 13, and gave a joint presentation with Marie Zhuikov, Minnesota Sea Grant communications coordinator, and Marco Yzer, assistant professor with the University of Minnesota, *Integrating Audience Perspectives into Sea Grant Programming* at that conference.



Summer Shoreland Workshops

While lake levels are low, it is a good time to establish aquatic and wet transition plants. These pictures were taken before and after the shoreline at St. Michael's Hospital, Sauk Center, was planted on 5/31.

The "after" photo was taken on 6/28/2006.

Shoreland owners from Reitz Lake in Carver County learned to identify and manage curly-leaf pondweed that infests their lake each year.

The plants were sprouting turions, so it was easy to demonstrate how pondweed reproduces and expands its territory (through rhizomes and turions).

After a short "classroom" session in a homeowner's garage, participants visited the shoreline for a hands-on, feet-wet, practical lesson in identification and removing curly-leaf pondweed.

Showing Off Minnesota's Mussels

Karen Terry, University of Minnesota Extension Service, Regional Extension Educator, 218-998-3927, kterry@umn.edu

Mussels are fascinating but can be hard to know because they spend most of their lives buried in the bottom of Minnesota's lakes and streams. When people do happen to find them, they often call them clams, but mussels and clams are not the same. They are both mollusks, but the biggest difference is that mussels are capable of making pearls and clams are not. Minnesota's clam species are very small, but our mussel species can be as big as dinner plates.

Minnesota's mussels have interesting names like spectaclecase, pistolgrip, heelsplitter, and warty-back. There are nearly 50 species of native mussels in Minnesota, but many of these are listed as endangered, threatened, or of special concern. One of the most imperiled groups of living things nationwide, mussels depend on clean water and diverse fish communities to survive. A healthy population of mussels is a good indicator of a healthy lake or river.

This giant floater is just one of Minnesota's many native mussel species. Photo credit: MN DNR

Mussels do not have eyes, legs, or fins. Throughout their lives, they move by floating downstream, hitching a ride on fish, or by anchoring with their 'foot' and pulling themselves along slowly. To reproduce, males release sperm into the water and the females draw it in to fertilize their eggs, which they brood internally. The females later release the tiny larvae, called glochidia, into the water. The glochidia then attach to a fish for the next stage of their lives. Many mussels require a certain species of fish to attach to, and if that mussel does not find that species of fish, then the glochidia will likely die. Glochidia that do latch onto the right fish attach to the fish's gills, fins, or scales and live as parasites until they are old enough to drop off, settle to the bottom, and begin life on their own. Mussels live from 10 to 30 years.

Native people used mussels for food, jewelry, and utensils. More recently, shells were used to make buttons for clothing, and they are still used in some places to make cultured pearls. Because mussels reproduce slowly, over-harvesting decimated many populations. Today it is illegal to harvest mussels in Minnesota.

This DNR mussel researcher is sorting mussels by species. After they are identified, they will be measured and recorded to create a list of mussel species in the water body. Photo credit: MN DNR

To learn more about mussels, look for empty shells in the shallow water along shore. You can study the shell as long as you return it to the place you found it, but it is illegal to pick up live mussels without a permit. More information can be found in the small spiral-bound book, "Field Guide to the Freshwater Mussels of Minnesota," available from Minnesota's Bookstore, www.minnesotasbookstore.com, 651-297-3000 or 800-657-3757. ■

Healthy Rivers: What's That Mean?

Karen Terry, University of Minnesota Extension Service, Regional Extension Educator, 218-998-3927, kterry@umn.edu

Like other ecosystems such as forests, prairies, and oceans, Minnesota's rivers and streams are complex ecosystems made up of interdependent components. The health and stability of riverine ecosystems depend on these components functioning in a balanced way. In recent times, scientists have categorized rivers into five major components: hydrology, biology, water quality, geomorphology, and connectivity. However, it is important to note that these categories are somewhat artificial because there is a lot of overlap between them. This article will look at the first three components. The other two components will be covered in the next issue.

Healthy rivers are a balance of elements that can be grouped into five components: hydrology, biology, water quality, geomorphology, and connectivity.

Hydrology relates to the flow of water through a watershed. Water is often discussed in terms of quantity, but the timing of the water moving through the watershed is important, too. An area may receive an average of 15 inches of precipitation in a year, but if that falls in a single week, versus at intervals throughout the year, it makes a significant difference within the ecosystem. Human actions can greatly alter the flow of water. In agricultural settings, for example, wetlands and small streams have been drained, ditched, straightened, and tiled in efforts to move the water off the surface of the land faster. In developed areas, such as along lakeshores and in cities, water moves off of impervious surfaces very quickly, and enters nearby waters. In these ways and others, humans have changed the timing of the water moving through watersheds, resulting in negative impacts on rivers.

The biology component encompasses all living things in rivers, both plants and animals. Diverse communities of plants and animals cannot exist without diverse habitat types within the ecosystem. Healthy rivers are typically made up of combinations of deep, slow pools and shallow, fast riffles, and such rivers are better able to support all the life stages of a species. A change in the population of a plant or animal is often the first indication that the balance of the five components has been disturbed. A decline in water quality, for instance, may be detected as a drop in numbers of gamefish in a river.

The water quality component relates to the chemical and physical properties of river water. These properties are not the same for all rivers, and they can vary within certain amounts on each river. Temperature, for example, varies considerably from cold-water streams to warm-water streams. Even within a warm-water stream the temperature can vary some without causing the system to become unstable. In addition to temperature, water quality is also determined by levels of sediment, oxygen, nutrients, alkalinity and pH, and contaminants. Water quality is closely linked to hydrology and biology. ■

Watch this space in the next issue of From Shore to Shore, for the second article in this series that will describe what relationship geomorphology and connectivity have with healthy rivers.

Water Resources Center
Sea Grant Minnesota
University of Minnesota Extension Service

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