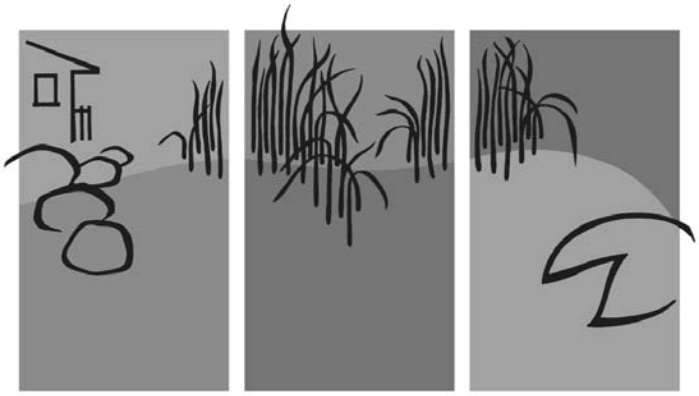

From Shore to Shore

For Minnesota citizens promoting the health of our rivers & lakes

November-December 2006

#76

Available Soon: A Guide for Identification of Minnesota Aquatic Plants

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Wondering if that large patch of aquatic plants in your lake is invasive Eurasian watermilfoil or curly-leaf pondweed…or perhaps a native aquatic plant that occurs in healthy lakes? Or maybe you're interested in learning more about your lake or river and the plants that are in it?

This guide provides an easy-to-use approach to identifying aquatic plants — including aquatic invasive species. Use the information found in this guide and the references listed within it to answer questions you have about aquatic plants or attend a University of Minnesota Extension Aquatic Plant Identification workshop for instruction on use of the guide and experience in identifying live aquatic plants. Visit www.extension.umn.edu/shoreland/ for a workshop schedule.

A Guide for Identification of Minnesota Aquatic Plants, item #08242, will be available in November 2006. For information or to place an order, contact the University of Minnesota Extension Store (http://shop.extension.umn.edu/). ■

Rush Lake Erosion Research — What's New in 2006?

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The four erosion control treatments installed in 2005 to stabilize the sandy slopes of County and DNR islands on Rush Lake (Crow Wing County) continued to hold the slopes in place one year later. In spite of the recent drought, many of the native flowers that were planted and most of the grasses that were seeded in 2005 survived and spread over the slope — as well as a few uninvited weeds. The drought took a toll on the upland bare-root trees and shrubs with less than 50% survival after one year. However, live-stake and bare-root shrubs installed in the wet fringe area had greater survival. The remaining eroding slopes on the islands were seeded with a mixture of native flower and grass seed (no flower plants were installed this year) and covered with one coco blanket. Brush bundle terraces were added on long slopes.

A new hydro-mulch product and technique were tested this year. Instead of mixing the seed with the mulch slurry prior to spraying (done in the 2005 application), the seed was hand-broadcast on the slope prior to hydro-mulching for more even distribution and greater germination. However, little plant life was evident at the end of the season, presumably due to the drought and not the new product and technique (see Table 1 for details).

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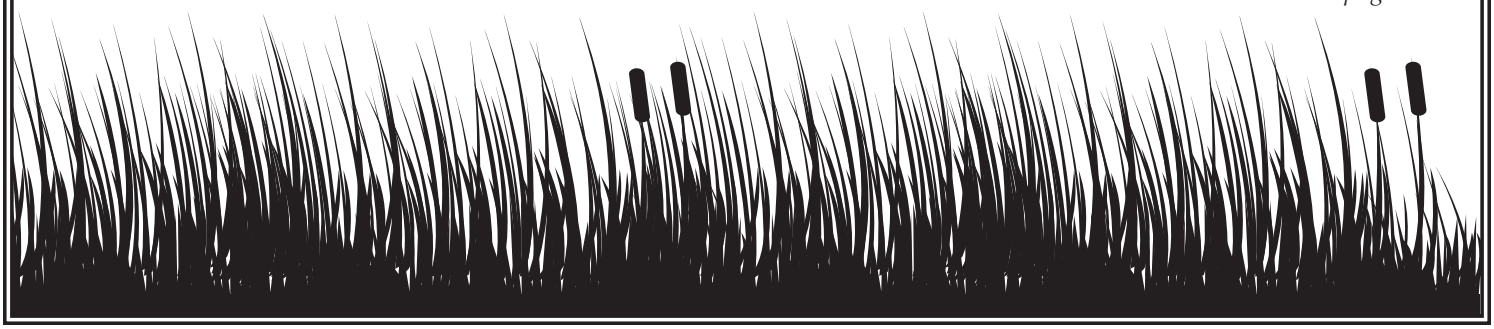

Lakes and Rivers Conference Attended By Over 500 People

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The 2006 Lakes and Rivers Conference, hosted by Minnesota Waters September 7 – 9 in Duluth, was attended by 550 people representing lake and river associations, local and state government, non-profits, education, and businesses who gathered around a common interest in water resources management in Minnesota. A theme of "The Changing Landscapes of Minnesota's Waters" permeated the 48 sessions, 8 workshops, and three field trips over three days to provide attendees with increased knowledge of water issues, skills to improve the effectiveness of citizen groups to improve and protect our waters, and resources and tools to put into action for specific water issues. A plenary session featuring a panel of experts concluded that changing social expectations, shifting demographic projections from urban to rural lake areas, declining and changing recreational use patterns on our waters, and real climate changes will have broad implications for the future quality of Minnesota's waters and our willingness to protect these resources for future generations to enjoy unless we act now.

A complete list of sessions can be viewed on the Minnesota Waters Web site at www.minnesotawaters.org. Copies of presentations can be solicited directly from presenters. Contact info@minnesotawaters.org for speaker contact information. The next Minnesota Waters Lakes and Rivers Conference will be held in the fall of 2008 at a location to be determined; watch for the specific date by the end of 2006. ■

Rush Lake Erosion Research — What's New in 2006?

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Table 1: Comparison of slope treatments

Trial (600 sq ft)	Materials	Native Seed	Native Flower Seedlings	2005 Percent Cover	2006 Percent Cover	2006 Effectiveness/Notes
2005 Trials						
1 coco blanket	$174	$14/trial (1 lb. of grass)	$158/trial of 45 seedlings each	33%	50%	No erosion, increased cover due to native grasses
2 coco blankets	$399			13%	23%	
Futera blanket	$96			45%	78%	
Hydro-mulch	$425*			38%	58%	
2006 Trials						
1 coco blanket	$174	$36/trial (1 lb. grass + 4 oz. flower)	none	NA	8%	No erosion, cover is mostly weeds
Hydro-mulch	$220*		none	NA	15%	

* Includes contractor installation cost. Other trials were installed by volunteers and cost includes only materials.

The toe treatments installed in 2005 were not affected by ice heave during the winter or spring ice-out. There was no visible erosion behind the live fascine, coco log, rock gabion, and rock rip rap treatments and only minor erosion between the gaps in the log rafts and stump revetments. The live fascines failed to root in spite of numerous roots visible in 2005. This is likely due to roots not having access to an appropriate rooting medium — the roots were unable to penetrate the geotextile to reach the soil behind it or sediment and organics did not adequately fill in the voids within the fascine. Other products and techniques involving fascines will be tested in 2007. The aquatic emergent plants installed in 2005 were well established and spreading in areas where they were protected by wave breaks or behind the toe treatments, but had washed away in unprotected areas.

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Healthy Rivers: What's That Mean? (Part 2 of 3)

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In the last issue, rivers were described as ecosystems that can be artificially broken down into five categories to make them easier to study. Those categories are hydrology, biology, water quality, geomorphology, and connectivity. The first three were discussed in the last issue. This article will focus on geomorphology, and connectivity of rivers will be covered in the next issue. As a reminder: there is a lot of overlap and interdependence among these five categories so any change to the river system typically results in impacts that fall into more than one category.

Geomorphology refers to the shape of the river. This is determined by several factors such as the amount of water flowing through it, the steepness of the river valley, and soil type. Think about the streams on Minnesota's North Shore: they tend to be fairly straight, with few meanders, because the slope is steep and they are dominated by boulders and bedrock. They are more like mountain streams than prairie streams. Prairie streams, like those in southern and western Minnesota, tend to be low gradient (not steep), and the soils are loamy and fine. These factors create streams that are curvy, or that meander back and forth across the landscape, and often have broad floodplains. In addition to meandering across the floodplain, rivers also move up and down along their beds, forming deep places (pools) and shallow places (riffles).

Here the big meanders of the Red River of the North through Crookston are evident. The water moves slower in a sinuous channel than it does in a straightened channel because it has to travel farther.

This aerial photo shows a sinuous stream in northwestern Minnesota. Stable streams have predictable patterns, including size and spacing of meanders.

Although healthy rivers have predictable shapes, they do change over time. River bends, and the pools and riffles associated with them, tend to move downstream, and oxbows are sometimes created when a river abandons a bend by cutting a new channel. These changes, when not impacted by humans, happen very slowly and the river's overall geomorphology remains the same.

Many of Minnesota's streams have been altered by humans. Practices such as *channelizing*, which is removing the meanders and creating a straight ditch, and *dredging*, which is removing the shallow areas to make the river uniformly deep, disrupt the river's ecosystem. These altered systems have less diverse habitat, which negatively affects the health of the plant and animal communities that live there, and the altered systems are unstable because the river's physical properties continuously work to return to the stable geomorphology that existed prior to the disturbance. This is often visible as raw, eroding banks as the river eats away at the straightened edges to re-establish its meanders. This exacerbated erosion contributes huge amounts of sediment to the river. Channelization, because it steepens the slope of the river, also impacts the hydrology of the system by speeding up the water.

In the next issue, connectivity, the last of the five components of healthy rivers will be discussed. ■

Rush Lake Erosion Research – What's New in 2006?

In this 2006 photo, the river bulrush that were planted as a pre-vegetated mat in 2005 are well-established behind the brush bundle wave break and are spreading toward the lake.

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Two new shoreland toe protection products were added to the research project this year. These include Shore Sox and flax logs. Both were installed along the eroding shoreline in late spring. The flax logs are similar to coco logs, but with flax stalks replacing the coconut fiber filling and a photo-degradable poly netting replacing the jute netting surrounding the coco logs. These are anchored along the shore with wooden stakes. The Shore Sox are made of corn husk bales placed in photo-degradable woven bags. The bags are held together with ropes strung through sleeves at the top and bottom of the bags. They are anchored to the shore with wooden stakes. Once the bales are saturated, plants can be installed in them. Only licensed and trained dealers of this product are allowed to install Shore Sox. These products have not been tested for long-term, site specific erosion control (i.e., Does the shoreline remain stable when fiber filling and cover have decomposed in three to five years?) See Table 2 for a comparison of all the toe treatments used in the project.

Table 2: Comparison of Toe Treatments

Toe Treatment (20 linear ft)	Cost	Time to Install	Time to Maintain	Effectiveness/Notes
2005 Trials				
Live fascine	$9	1.5 hrs	0 hrs	No erosion, fascine failed to root, other plants rooted behind fascine
Coco log	$157	0.5 hrs	0 hrs	No erosion, cable replaced with wood stake plants rooted in and behind log
Rock gabion tube	$97	2.5 hrs	0 hrs	No erosion, plants rooted in and behind gabion
Anchored log rafts	$206	5 hrs	3 hrs	Minor erosion in gaps between rafts, plants rooted behind rafts
Stump revetment	$136*	0 hrs*	0 hrs	Minor erosion between stumps, plants rooted behind stumps
Rock rip rap	$1,800*	0 hrs*	0 hrs	No erosion, no vegetation, sediment between rocks not conducive to walleye spawning habitat
2006 Trials				
Shore Sox	$760*	0 hrs*	0 hrs	No erosion (low water), 88% survival of plants installed in Sox
Flax log	$200*	0 hrs*	0 hrs	No erosion (low water), no plants installed in log

* Includes contractor installation cost. Other trials were installed by volunteers and cost includes only materials.

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