



From Shore to Shore

For Minnesota citizens promoting the health of our rivers & lakes

July - August 2008

#86

Rain Garden in Baxter

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What might be the biggest rain garden in central Minnesota was planted in Baxter in May of 2008. The 8,500-sq. ft. rain garden was designed by Westwood Professional Services, Inc., to handle the stormwater runoff from a 4.5-acre, low-impact development site – Fairview Office Park.

The rain garden was the practical portion of a rain garden workshop presented by Eleanor Burkett, University of Minnesota Extension educator, and sponsored by the Northland Arboretum in Brainerd. In addition to workshop participants, Crow Wing County Master Gardeners and site developers also assisted with this hands-on portion of the project.

The sides of the rain garden (3,014 sq. ft.) were seeded with Grassland LoGRO (a no-mow-grass seed mix) and covered with an erosion blanket. The bottom of the rain garden (5,486 sq. ft.) was amended with about 4 inches of a mixture of 2/3 peat and 1/3 sandy loam and tilled. Two inches of shredded mulch were added afterwards. Here, 853 plants were planted. Plant selection included ornamental grasses, perennials, and shrubs. For research purposes, native and non-native varieties of the same plant were selected.

Much of the costs associated with the installation of this



Wild Bergemot (Monarda fistulosa), one of the native species planted in the rain garden.

rain garden were covered by grants from the Minnesota Pollution Control Agency and the Crow Wing County Water Plan. The owners of Fairview Office Park agreed to water and weed the commercial site's rain garden on an ongoing basis.

Educational signage with information about rain gardens and the names of the plants used at this rain garden will be installed soon. The public is encouraged to visit Fairview Office Park at 13760 Bluestem Court in Baxter to see this great rain garden. ■

Calendar of Events

For the most current listing of Shoreland Education workshops, visit www.extension.umn.edu/shoreland.

→ Shoreland Maintenance

July 19, 2008 – Deerwood, MN

Contact: Sandy Kretlow at kretlow@mlecmn.net

→ Aquatic Plant Identification

July 26-27, 2008 – McGregor, MN

Contact: Neal Sampson, neal.sampson@century21.com

→ Rain Gardens

August 13, 2008 – Winsted, MN

Contact: Karen Terry, kterry@umn.edu

→ Shoreland Buffers

August 16, 2008 – Battle Lake, MN

Contact: Mike Kotten, 218-864-5665, mkotten@att.net

→ Shoreland Buffers

August 22, 2008 – Backus, MN

Contact: Paula West, 218-838-5010, westcom@brainerd.net



Rain Gardens – Why Not?

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Natural resource professionals and concerned citizens who provide information, classes, and/or cost-share for rain gardens, shoreland buffers, and other homeowner practices that will improve water quality in our lakes and rivers and provide wildlife habitat are asking this very question: Of the homeowners that understand the great benefits of these practices, why aren't more of them taking action? Also: How do we reach additional homeowners with this message and encourage them to install a rain garden or shoreland buffer or take other appropriate action?

There is a temptation to assume that we understand why people act as they do when we should really be asking them! Sounds simple, right? But to uncover and understand people's attitudes and beliefs that may influence the likelihood of them installing a rain garden or shoreland buffer requires the assistance of social scientists. Through focus groups, surveys involving carefully designed questions, and other mechanisms for eliciting perceptions, social scientists are helping us discover what really motivates people to take action on water quality issues and what obstacles prevent them from doing so.

One example involves University of Wisconsin social science researchers and extension educators collaborating on a project to motivate landowners to build rain gardens on their properties. Different from typical surveys, their surveys focus on landowner perceptions and beliefs about rain gardens and what others might think of them installing a rain garden.

Responses to their first survey of year-round and seasonal landowners provided valuable information on how to proceed with the project. Most respondents already felt they had an understanding of rain gardens and the potentially important link between rain gardens and water quality. One important barrier that might be a reason landowners do not build rain gardens is a preference to have a yard that is mostly lawn. Other landowner barriers to building rain gardens include: cost and expense, having insufficient time, and believing it would be too much work. The strongest predictors of an individual's intention to build a rain garden on their property in the next couple of years were the belief that rain gardens really would improve water quality and the availability of cost-sharing. Another significant predictor of behavioral intent was the degree to which respondents believed significant others, such as friends, family, and neighbors would look favorably toward them installing a rain garden.

The next step for Wisconsin researchers and extension educators will be to design a community-based social marketing campaign based upon these responses. The campaign will likely include communications about cost-share opportunities and activities that build social norms among friends, families, and neighbors.

For a more complete description of this UW project see: Chenoweth, R. 2008. Understanding Barriers and Incentives to Building Rain Gardens. *Environmental Communication & Social Marketing Newsletter*. UW Extension Environmental Resources Center, <http://ecsm.uwex.edu/> ■

Get the Lead Out!

Non-lead Fishing Tackle is an Effective Alternative, and it Protects Loons, Eagles, and Other Wildlife



Photo credit: USFWS

Tackling the problem

Lead is a toxic metal that, in sufficient quantities, has adverse effects on the nervous and reproductive systems of animals. Found in most fishing jigs and sinkers, this metal is poisoning wildlife such as eagles, loons, and other waterfowl. More anglers are using fishing tackle made from non-poisonous materials such as tin, bismuth, steel, and tungsten. And these alternatives are becoming easier to find.

Price point

Expect to pay a bit more for non-lead tackle. But consider all the other costs involved in a fishing trip — a few cents more to avoid lead poisoning of wildlife is well worth it.

Trolling for change

Minnesota is fishing country. We buy a lot of tackle. That's a big reason why our focus is on educating and partnering with others to stimulate the marketplace and speed the transition toward lead-free angling. Today, more environmentally friendly tackle is being made and sold, and growing numbers of anglers are going lead-free.

In Minnesota, there are no bans on the sale or use of lead weights and jigs. In many areas though, non-lead tackle isn't just a good idea — it's the law.

- Maine, New Hampshire, New York, and Vermont have banned the use or sale of lead sinkers in recent years. Massachusetts prohibits their use in certain key wildlife areas. Canadian national parks and national wildlife areas have banned the use of lead sinkers and jigs weighing less than 1.76 ounces (50 grams).
- The U.S. Fish and Wildlife Service has or is planning restrictions on lead sinker use in over two dozen national wildlife refuges and Yellowstone National Park.

- The European Union has banned lead in all consumer products, including fishing tackle.

What's the risk? Weigh the evidence:

While it is hard to get an accurate count of water birds and birds of prey that die from ingesting lead tackle, current research indicates that lead poisoning is a serious concern — and that such poisoning is avoidable because non-toxic alternatives are available.

Research around the nation has found that lead poisoning from lead fishing tackle is responsible for 12 to 50 percent of adult loon deaths.

The Raptor Center at the University of Minnesota has monitored injured bald eagles for lead since 1980. Lead poisoning has been the cause of admission of 315 out of a total of 1,398 eagles, or 23 percent. Eagles are exposed when they eat fish that have ingested lead tackle.



These pebbles and sinkers were found in the gizzard of a lead-poisoned loon. Loons mistake lost weights for pebbles they eat to grind their food.

Teach your tadpoles

Create a lead-free tackle box for your kids or grandkids. Choose from the tin split shot, bismuth jigheads, and tungsten composite worm weights. They are non-toxic and safer for youngsters to handle. Plus, it's a great way to help instill a strong conservation ethic.

Don't throw old lead tackle in the trash

Bring it to your local household hazardous waste collection site during your next visit. Some scrap metal recyclers may also accept lead.

This information comes from a fact sheet produced by the Minnesota Pollution Control Agency. For more information (including a list of lead tackle exchange events, how to order educational kits, and a list of lead-free alternative retailers and manufacturers) or to download the fact sheet, visit <http://www.pca.state.mn.us/oea/reduce/sinkers.cfm>. ■

Ferns: A Natural History (Part I)

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Ferns have been around for a long time, having been found in fossils dating back some 345 million years. During this time, amphibians, reptiles, and flying insects were abundant on our planet, yet dinosaurs, birds, and mammals had not yet arrived. Early fern ancestors were different in growth habits than modern ferns and had vast branching and shoot systems. These early ferns went extinct approximately 270 - 290 million years ago, but before they disappeared, some evolved to ancestors of modern fern species exhibiting similar growth habits familiar today.

How ferns reproduce has stumped many botanists and scholars unable to determine whether the "dust" found on the underside of the leaf was the seed or pollen. In folklore, ferns were thought to have had "invisible seed," only to be collected on Midsummer's Eve. Now we know ferns differ



Photo Credit: Renee Pardello



Photo Credit: Renee Pardello

from other plants such as trees, flowers, and grasses as the "dust" are spores that germinate when they are released and land on a suitable substrate. But wait! The life cycle of ferns is a little more complicated than that. Once the spores germinate, they grow scale-like vegetation that bears either (or both) male and female sex organs. The male sperm must find a female egg to fertilize. If all goes well, the fertilized egg's cells divide and eventually, spore-bearing leaves (fronds) will emerge. It may take up to three years to complete the fern life cycle from spore to spore-bearing leaf. Possibly because of this more complicated life cycle and the fact that spores tend to not live long in soil (seeds often can lie dormant for many years with viable germination), there are fewer known species of ferns than their seed bearing counterparts.

Since the advent of DNA mapping, the way botanists think about plants once called "fern allies" has changed.

Horsetails (*Equisetum*) and whisk ferns (*Psilotaceae*), once termed fern allies, actually are ferns according to their DNA structure. Ferns belong to a group of plants called *Pteridophyta*. Clubmosses, spikemosses and quillworts are not ferns; they are in the *Lycopodiophyta* group and contain a very different molecular structure than *Pteridophyta*.

Some plants that are not ferns but are called ferns include air fern (actually these are animals called Hydrozoa, related to jellyfish and corals), sweet fern (*Comptonia peregrina*, a flowering shrub), and asparagus fern (*Asparagus* spp., which are seed-producing plants).

A number of ferns are considered invasive species. These may include bracken (*Pteridium aquilinum*) and sensitive fern (*Onoclea sensibilis*). Giant salvinia (*Salvinia molesta*) is a highly invasive aquatic plant creating mats several feet thick, choking out other plants and causing waterways to be unnavigable.

In the next issue of *From Shore to Shore*, we will look at the uses of ferns, some of the ferns of Minnesota, and more. ■

Resources:

Moran, R. C. (2004). *A Natural History of Ferns*. Portland, OR. Timber Press.

Fern. (2004, February 21). In *Wikipedia, the free encyclopedia*. Retrieved June 6, 2008, from <http://en.wikipedia.org/wiki/Fern>

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