

From Shore to Shore

For Minnesota citizens promoting the health of our rivers & lakes

March - April 2008

#84

Lake Home and Cabin Show

Natural Resources and Environment educators will be participating in the 2008 Lake Home and Cabin Show, Friday April 11 to Sunday April 13 at the Minneapolis Convention Center (<http://www.lakehomeandcabinshow.com/minn/index.php>). Shoreland Education and septic system experts will be available throughout the show to answer your questions as you check out our hands-on exhibits and displays. In addition, stage presentations will be given on Friday 6-7 p.m. and Saturday 3-4 p.m.

This year, we will have a kiosk set up where you can purchase books, DVDs, and other products. The 2008 Lake Home and Cabin Show will be a great place to get the latest shoreland information from University of Minnesota Extension. ■

Concerned about Your Lake's Water Clarity?

An informative article about the phosphorus balance in Minnesota lakes and its effect on water clarity – titled “Enemy of the Lake” – was printed in the Star-Tribune last month. Written by Larry Baker, a senior fellow with the University of Minnesota's Water Resources Center, the article is available online at <http://www.startribune.com/opinion/commentary/14441106.html>.

The article explains the relation between water clarity, lake size and watershed size, and the amount of phosphorus entering the lake; lists some of the major sources and practices that contribute phosphorus to our lakes; and calls for specific changes to decrease the amounts of phosphorus moving through watersheds. ■

Calendar of Events

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

→ Harmful Algal Blooms Workshops

10 a.m. – 3 p.m.
March 4 - Sauk Centre
March 5 - Mankato
March 6 - St. Paul - This workshop will also be available as a webcast at: www.pca.state.mn.us.

Contact: : Barb Liukkonen, 612-625-9256, liukk001@umn.edu

→ Rain Barrels Presentation

March 15, 8:30 a.m. - 4:00 p.m. – Perham
This 20-minute presentation will be given at the East Otter Tail Horticulture Day.

Contact: Jackie Froemming, 218-824-1068, froem022@umn.edu

→ Rain Garden Workshop

March 24, 7 p.m. - 9 p.m. – Onamia
Contact: Lynn Carter, 320-983-2160, Lynn.Carter2@mn.nacdn.net

→ Lake Home and Cabin Show

April 11-13 – Minneapolis Convention Center
<http://www.lakehomeandcabinshow.com>

→ Rain Garden Workshop

April 15, 6:30 p.m. - 9:30 p.m. – Menahga
Contact: Kari Tomperi, 218-631-3195 ext. 3, kari.tomperi@mn.nacdn.net

→ The Value of Healthy Lakes

May 6 – Walker
This workshop is for realtors, contractors, and builders.
Contact: Paula West, 218-838-5010, westcom@brainerd.net



The Vernal Pool: A Place of Wonder

Tom Schneider, Columbus (OH) Chapter of Wild Ones, www.for-wild.org

[This article is reprinted with permission from the March/April 2006 issue of the Wild Ones Journal, a publication of Wild Ones: Native Plants, Natural Landscapes. To download a copy, visit <http://www.for-wild.org/download/vernalpool.pdf>.]

As a young boy, my brothers and I often visited a pond in the woods just beyond our property. Each spring, just as the warm sun marked our escape from winter's enclosure, it also revealed the arrival of many egg masses in "our pond." Thousands of eggs in clumps, strings, and masses were scattered throughout the pool. These eggs contained small creatures with feathery attachments to their heads. Now, as a biologist, I know that "our pond" was a vernal pool and those eggs were from a special group of salamanders. Not only did "our pond" provide a home and nourishment for many young salamanders and frogs, it also nourished the imagination and sense of discovery in our young minds.

Vernal pools are unique and interesting wetlands, usually found in forested areas. They are essential to the life cycle of many amphibians, which include frogs, toads, and salamanders, as well as invertebrates, including fairy shrimp and dragonflies. Vernal pools go by many names including ephemeral wetlands, seasonal ponds, and playas in some western states. They are wet only for a portion of each year. During this period, many animals are in a race against time. They need to hatch, grow, and in some cases, reproduce, before these small wetlands dry out.



Spotted salamanders (*Ambystoma maculatum*), are usually associated with heavily wooded, mature beech-maple forests and mesic oak woodlands. Breeding occurs in vernal ponds, marshes, and swamps within or at least mostly surrounded by woodland.

The pools fall between what has been discussed in this publication as rain gardens and what we all know as ponds. They hold water for a minimum of six weeks a



Ice on the water does not stop mating and egg-laying.

year, some for up to six months, and still others will only dry out every other year or so. Most pools are three feet deep or less at the wettest time of the year. Because of the periods of dryness, vernal pools almost never have a permanent fish population. Fishless waters are essential to the successful reproduction of many amphibians. Any fish would quickly eat the young amphibians.

In vernal pools around the country, a millennia-old ritual occurs during the first warm, rainy night(s) of late winter/early spring. Usually occurring between Valentine's Day and St. Patrick's Day, this first warm rain above 50° F, sparks the mass migration of mole salamanders (spotted, small-mouth, Jefferson, tiger, and others), frogs, and toads. Over the course of this "big night," and the following days and weeks, many different salamanders, frogs, and toads may migrate to the pool where they were born. At this natal pool, they repeat the mating ritual of their parents.

Mole salamanders are named for the fact that they live underground most of the year, burrowing or using other animals' burrows. The first of the mole salamanders to arrive at the pool is the spotted salamander. Heeding an instinctive call to return to their natal waters, they travel over snow, rocks, logs, and other obstacles to enter pools that are often partially covered with ice.

Eager males await the arrival of females, which results in a "congressing" of individuals, and eggs *cont. on page 3*

The Vernal Pool: A Place of Wonder *cont. from page 2*

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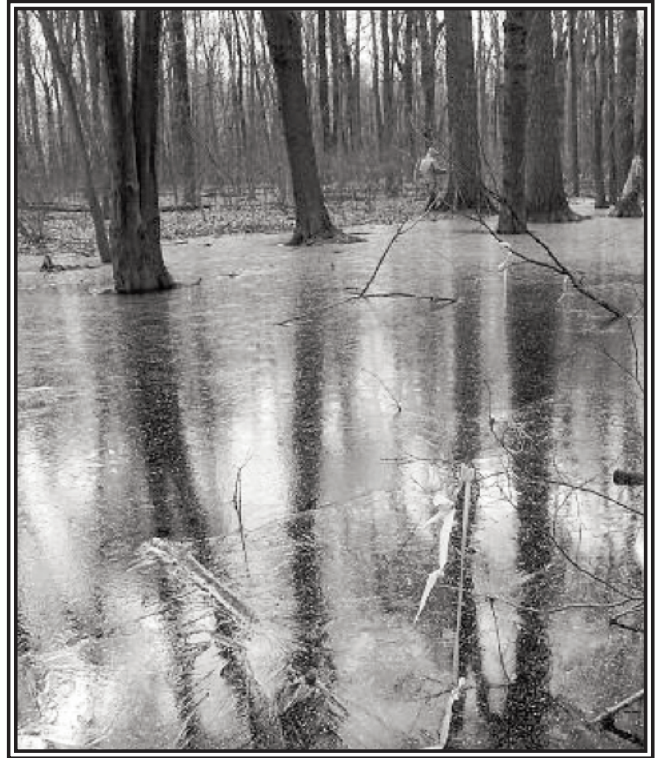
are fertilized. Females lay their eggs in masses. Each salamander, frog, or toad species' egg mass is different, and you can generally identify the species they came from. These egg masses mark the beginning of the race against dryness that will face residents of the pool. While the adults leave shortly after reproduction, the young must emerge from their eggs, feed, grow, and transform from aquatic larvae to air-breathing adults capable of surviving on land before the pool dries out.

Wood frogs are the first of the frogs and toads to migrate to their vernal pools. Following a short courtship, male and female wood frogs pair up. Eggs are laid in large communal mats at various locations in the pool. Similar to the salamanders, the tadpoles must develop fully and leave the pool before it dries out. Other organisms have different adaptations for surviving the drought periods. Some remain as cysts, or dry-tolerant eggs, while others burrow into the muddy bottom of the pool to wait for the water to return. A given group of cysts will often hatch at differing times within the same year or even across multiple years, thus increasing the chance some eggs will hatch during a good year. Regardless of the mechanism, vernal pool species must win the race against dryness, if not every year, then at least frequently enough to ensure successful production of another group of adults.

Vernal pools occur in varying habitats and portions of the country. Vernal pools in northern and eastern portions of the country have a variety of plants associated with them. The type of plants depends upon whether the pools are located in upland woodland areas or as parts of larger wetland/swamp complexes. Some plants familiar to native plant landscapers are components of vernal pools. Herbaceous plants such as cardinal flower, sensitive fern, blue-joint grass, and many sedges grow in these habitats. Shrubs such as buttonbush, winterberry, spicebush, viburnums, and others are often associated with vernal pools.

Vernal pools often go unnoticed because their cyclical nature has them at their most active and full when we are least likely to be out in areas where they exist. Not many have the calling to go out on a cold rainy night in February seeking the elusive "big night" migration. Vernal pools may appear as simple depressions in a woods or field during the summer, and can be defined by watermarks on trees, buttressed tree trunks, vegetation types, and other subtle differences in the surrounding landscape.

Not just the pool is important. The adult salamanders and frogs only spend about two weeks of the year in the



A small vernal pool like this one will likely dry out by mid-summer or early fall.

water – and the rest of the year in the surrounding forests and fields. In fact, the surrounding habitat is essential for adult amphibian survival. Most salamanders reside within 300 meters of their vernal pool the rest of the year. The trees, plants, logs, stones, and leaves surrounding the pool provide shelter and food. The native plants that we strive to maintain in our yards, gardens, parks, and preserves are another essential link in the life-cycle of these fascinating creatures of our youth. Development, roads, drainage, etc., have caused significant habitat reductions and subsequent population declines for amphibians. Not only do roadways result in destroyed habitat, they can also present barriers to movement, leading to mass deaths by vehicles during spring migrations.

Vernal pools are educational openings for learning skills from measurement, graphing, and observation – to trophic levels, energy transfer, and adaptation. They offer wonderful windows into the complexity of natural systems and provide endless opportunities for discovery and astonishment. Even after all these years, springtime in a vernal pool refreshes my sense of wonder and awe. ■

Reconnecting the Red River

Amy Childers, Minnesota Dept. of Natural Resources, amy.childers@dnr.state.mn.us

The Red River of the North once supported a thriving prairie ecosystem interlaced by a flourishing aquatic world where giant lake sturgeon weighed as much as 180 pounds. However, since the early 1800s, over 500 dams have been built on the Red River of the North and its tributaries.

Dams unfortunately have various harmful effects on rivers and their inhabitants. To start with, dams create barriers to fish migration, which is critical to fish populations that need to spawn or overwinter in upstream areas. As dams were built on the Red River, lake sturgeon – which spawn in the upper tributaries – could no longer reach their spawning grounds. By the mid 1900s, lake sturgeon were gone because the fragmented river system deprived them of crucial spawning areas.



Breckenridge – during its third failure.

Furthermore, dams block the natural flow of water and sediment through rivers, which is essential in creating and maintaining habitat for fish, mussels, and aquatic insects. Finally, low-head dams are dangerous and are commonly referred to as ‘drowning machines.’ At least 100 people have drowned below Red River Basin dams.

In an effort to restore lake sturgeon populations, enhance other fish populations, and make the river a safer place to

fish and boat, the Department of Natural Resources (DNR) is working with local communities to “Reconnect the Red.” To this end, the DNR’s Stream Habitat Program has been removing low-head dams or modifying dams into rapids. By completely removing dams, the natural function and flow of the river are restored, the fish barrier is eliminated, and the drowning machine is removed. In the other case, when dams are modified into rapids (by filling the downstream side with a long ramp carefully composed of thousands of tons of boulders to replace the sheer drop), the fish barrier and the drowning machine are eliminated.



Breckenridge – after modification into rapids.

As of 2007, at least 24 dams have been removed, modified, or washed out in the Red River Basin, opening hundreds of miles to migrating fish. Stocking of lake sturgeon, which began in 1997, has reintroduced this native species and their survival has been good. Up to two dozen fish species, including walleyes, saugers, northern pike, and channel catfish, have been observed using the artificial rapids to pass upstream. This is an encouraging indication the Red is being reconnected. As the number of dam removals and modifications grows, the closer the Red will be to its natural design, when lake sturgeon flourished and grew as big as you and me. Imagine that! ■

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www.seagrants.umn.edu

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