



Amphibian Voice

Vol. 12 No. 2

Summer 2002

Ontario's Ephemeral Wetlands

The Vernalis Project: Searching Ontario for Ephemeral Wetland Habitat

By: Bentley Christie

This spring marked the very humble beginnings of the Vernalis Project, a personal effort to compile data on and raise awareness of ephemeral wetland habitats in Ontario.

With a quick surf of the web one can see that these habitats with the unique organisms that live in and around them have become a hot topic for discussion in parts of the United States. Much of the attention has been focused on California, where environmentalists have been struggling to prevent developers and others from destroying these unique habitats. According to various figures, over 90% of the ephemeral wetlands (also referred to as temporary and vernal pools/ponds) in the state have been lost. How could this be? Well, as aptly stated on the Environmental Protection Agency's website, these habitats are "often smaller than the bulldozer that threatens to destroy them". Commonly



appearing simply as oversized puddles, ephemeral wetlands are often overlooked because of their small size and the characteristic dry phase.

The Fairy shrimp is an organism that depends on ephemeral wetland habitats for survival. Fairy shrimp are close relatives of the well-known crustaceans, brine shrimp (a.k.a. Sea Monkeys™) and it was these fascinating creatures that originally ignited my interest in ephemeral wetlands. Currently in

California, five Fairy shrimp species are listed as either endangered or threatened, while continued efforts are being made to attain protected status for others. In Ontario there are presently records for two different (but very closely related) species.

In terms of size and population Ontario is faced with a somewhat different situation, having more than twice as much land area with about 1/3 the population of California, so the threat may not be quite so apparent. It is very important to initiate and continue conservation efforts in Ontario especially in the densely populated areas of the

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south, to prevent a similar fate as California. This year my goal for the Vernalis Project was to locate as many Fairy shrimp pools as I could in Southern Ontario, a task more difficult than I had planned. Aside from the relatively short window of opportunity (Fairy shrimp lifecycle is usually completed in about a month), I soon discovered that there are many ephemeral wetlands that don't have these crustaceans in them. In the end, I managed to track down 30 Fairy shrimp pools but discovered many other ephemeral wetlands in the process.

So what does the future hold for the Vernalis Project? Well, aside from continuing to expand the database of Ontario's ephemeral wetlands, I'm hoping to launch a website outlining my discoveries. I'm also very interested in incorporating amphibian and reptile (herpetofaunal) data into the project as well. I began the Vernalis Project because I recognised that ephemeral wetlands in Ontario are often overlooked habitats. I plan to continue my quest to identify as many ephemeral wetlands as I can in Ontario in order to thwart a similar fate as ephemeral wetlands in California.



***Editor's Note:**

Bentley Christie is an honours Bachelor of Science graduate in Biology (aquatic ecosystems). The Vernalis Project is an example of ONE person working to make a difference.

To find out more about these habitats check out www.vernalpool.org. Also, stay tuned to www.torontozoo.com/adoptapond for opportunities to participate in ephemeral wetland conservation in Ontario.

Lily Pads and Cattails

Adopt-A-Pond Programme Updates

By: Sarah Ingwersen

The Adopt-A-Pond Programme is developing new resources for the conservation of Ephemeral wetland habitat in Ontario. These new resource materials will include three posters titled "Salamanders and Vernal Pools", "Puddles Need Protection" and "Ephemeral Wetlands of Ontario". Next year we will develop our Ephemeral Wetland Curriculum Resource. We hope that you, as Adopt-A-Pond participants, will find them useful.



Salamanders and Vernal Pools poster is a collection of children's art. School children in the North Bay area were asked to draw a picture of the relationship between salamanders and vernal pools [ephemeral wetlands]. In 1999, during the Monitoring Salamanders Conference in North Bay, there was an art contest to select the drawings like the one pictured above.

Puddles Need Protection is a poster/flyer outlining how to get involved in ephemeral wetland conservation in Ontario.

Ephemeral Wetlands of Ontario is a poster guide to the characteristics and species of ephemeral wetlands in Ontario. The poster will include information on salamanders, frogs, fairy shrimp, and ducks.

2002 Spring Toad Festival: A Trilling Good Time

By Sarah Ingwersen

Toronto Zoo's 4th annual Spring Toad Festival, presented by the Adopt-A-Pond Programme, was held on May 4th and 5th. This year's festival was an overwhelming success. During the two day festival, over 1500 people ventured into the wetland area to participate in the festival and catch a glimpse of a calling or breeding toad.

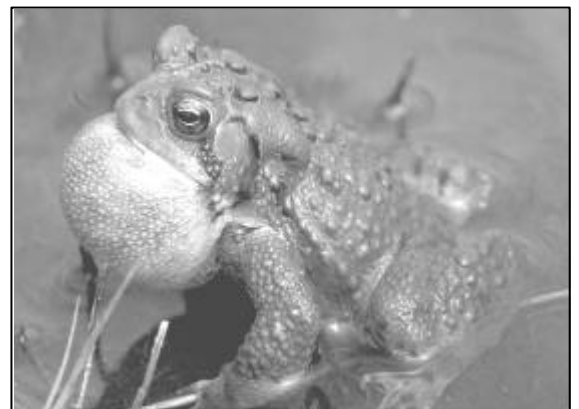


The temperatures warmed enough to coax a few males to call, but again this year the sporadic spring temperatures disrupted the American Toad's pond migration. The Festival is held the first weekend in May in response to 15 years of data supporting this period as the American toad's peak of breeding activity.

Festival-goers were the first to see the large American toad model perched on the sign roof at the wetlands. They met a giant American toad named "Toad," who greeted passing visitors, and they witnessed disappearing frogs

with the help of a magician! Festival-goers learned how to make origami frogs and operate the radio telemetry equipment that is used for wildlife tracking. They also learned some frog calls and how to participate in Frogwatch-Ontario.

With the help of zoo volunteers, participants were able to witness other fascinating lifeforms from around the wetland including leopard frogs, green frogs, water boatmen, dragonflies and red-winged blackbirds. Over 30 zoo volunteers helped to make the 2002 Spring Toad Festival a success.

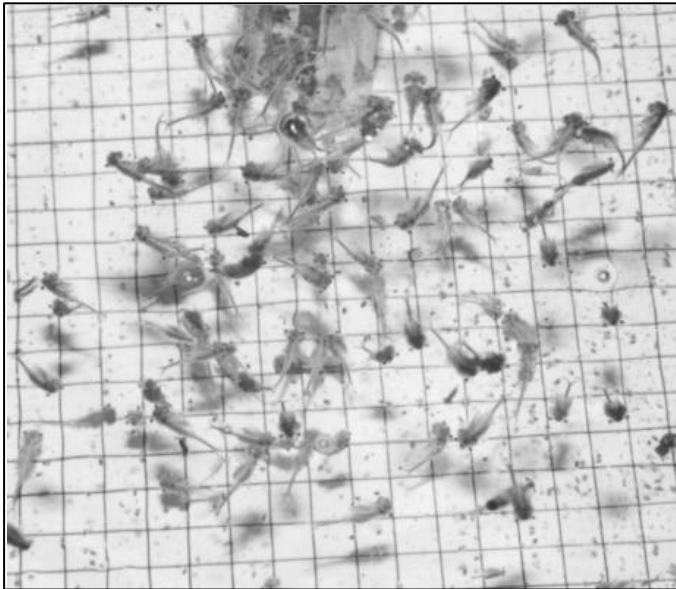


Call'um of the Wild

Discovery at Cawthra Bush

By: *Donald Barber*

The arrival of spring breathes new life into the forests and wetlands of Ontario. It is the time of year that grassroots stewards and naturalists dream of exciting new discoveries to be made in the natural world. This year in the Cawthra Bush, Mississauga, dreams came true. Naturalists, armed only with flashlights and cameras discovered large populations of Fairy Shrimp in a series of vernal [ephemeral] ponds and an ephemeral stream! (Fairy Shrimp are pictured below.)

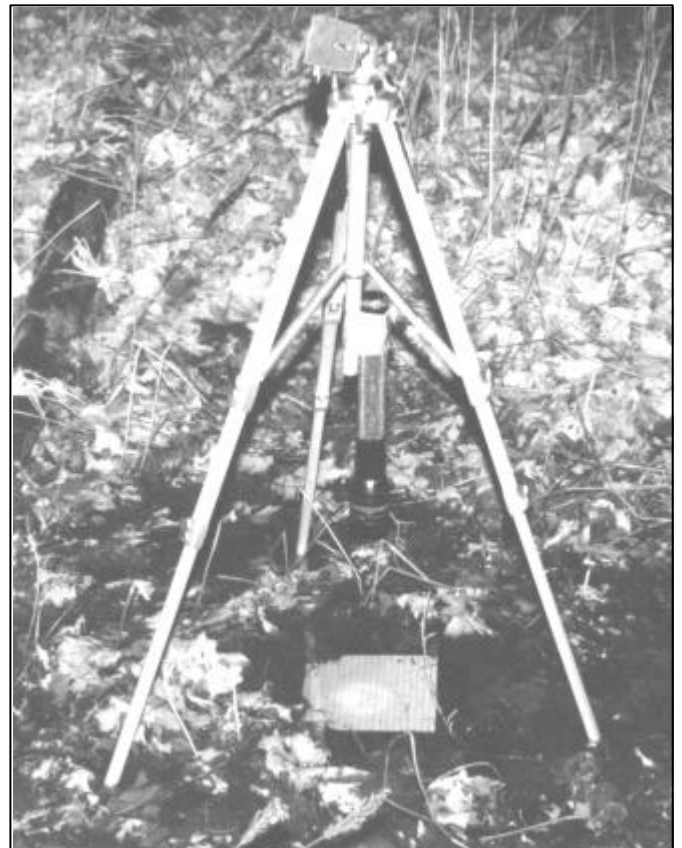


Ephemeral or vernal ponds form in landscape depressions by spring run off and/or high water tables. They dry up in mid to late summer, and therefore cannot support fish populations, creating ideal habitat for a variety of salamanders, frogs and toads to lay their eggs.

What got us all fired up about Cawthra's vernal ponds was Bentley Christie, an honours biology (aquatic environments) graduate. Mr. Christie is working on a vernal pond study and he happened upon our website while researching Fairy Shrimp. In the past we had only found two individual Fairy Shrimp, but Mr. Christie's guided tour was the catalyst for this year's exciting

discovery of large populations of Fairy Shrimp in the vernal ponds of Cawthra Bush. Mr. Christie referred to the Cawthra vernal pool complex as a "remarkable find" and "thus far I haven't seen anything remotely like this in such an extensively urban environment."

The Friends of Cawthra Bush (FCB) along with Mr. Christie discovered the advantages of searching at night for Fairy Shrimp, as they seemed to be attracted to flashlight beams. By attaching a flashlight to a tripod (photograph below) so that the light shines on a submerged square piece of plastic with a grid, a person can return to the same spot in a pond, repeatedly and document the number of Fairy Shrimp and size on any given night. Not only are they easier to see but population counts are easier to make using this method.



Fairy shrimp are one of several fascinating species in the Cawthra Bush. One of these species, the Jefferson salamander, has its last refuge there. This threatened species uses ephemeral ponds to breed. They swim gracefully through the pond, diving down to the bottom then gliding back to the surface to gulp some air.

The photograph (below) was taken of a Jefferson Salamander engaged in this ballet on a nighttime search.



Another species that was discovered in Cawthra Bush this year was the Chimney Building Crayfish. This species, unlike other species of crayfish, can move about on dry land! They get their name from the chimney-like tunnels they dig to reach the water table. This enables them to live in areas that appear to be bone dry for months at a time.



The Cawthra Bush is an old growth ecosystem that survives as a fragment of the original environment, and is large enough to have two forest interiors. FCB has worked hard to have the Cawthra Bush recognised as more than a stand of trees. Cawthra Bush now boasts a complex of Provincially Significant Wetlands. The FCB found and continues to document

many of Cawthra's wetland species and features.

FCB continues to find out fascinating information about the vernal ponds of Cawthra Bush and the work is on-going. Frog Monitoring is currently underway for the first year at the Cawthra Bush. Water flow measurements, rain fall data, and pond depth information are forwarded to the Ministry of Natural Resources and added to the Cawthra Bush wetlands file.

Cawthra Bush has attracted many experts who have identified other fascinating species there like Dead Man's Fingers (fungi) and Pileated woodpeckers. Cawthra Bush became recognised as provincially significant because our local community rallied together and made some unique discoveries!



Editor's Note

Don Barber is the president of Friends of Cawthra Bush. He continues to explore the natural secrets of this important area with other members of the community.

For more information on the amazing species in this article check out the web sites listed below.

- Friends of the Cawthra Bush (FCB) site: <http://home.eol.ca/~donbar/>
- Fariyshrimp: http://www.vernalpool.org/inf_fs.htm
- Jefferson Salamanders: http://www.vernalpool.org/inf_mol.htm

Ephemeral Wetlands: A Vanishing Habitat Conference

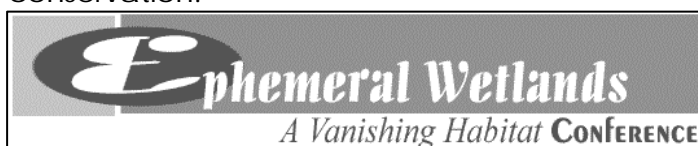
By Sarah Ingwersen

Ephemeral wetlands, often overlooked habitats, were the focus for a two-day, comprehensive conference in Chicago, Illinois. The Ephemeral Wetlands: A Vanishing Habitat Conference, hosted by the Midwest Environmental Protection Agency, incorporated a wide variety of topics. Presentations were organized under several primary headings including: natural history, conservation issues, indicator use, land use issues, restoration activities, conservation and education programmes, regulatory issues and funding resources.

I travelled by train to Chicago in February to participate in this unique conference. There were over 300 representatives from a variety of government and non-government agencies, researchers, educators and students from across the United States, and I was the only Canadian!

I presented a paper on the Adopt-A-Pond's Ephemeral Wetland Project. I covered the development of an on-line ephemeral wetland registry, curriculum resource, poster series, workshops, creation and restoration of ephemeral wetlands, and research (The Snapping Turtle Critical Habitat Study has shown that Snapping Turtles use ephemeral wetlands as hibernating and spring foraging sites). The feedback on Adopt-A-Pond's initiatives was enthusiastic and as a result several contacts were made with ephemeral wetland experts in the U.S.

If I could have just one wish it would have been to see better representation from Canada. Ephemeral wetlands are an important habitat to conserve! With your help we can make Ontario Canada's leader in Ephemeral wetland conservation!

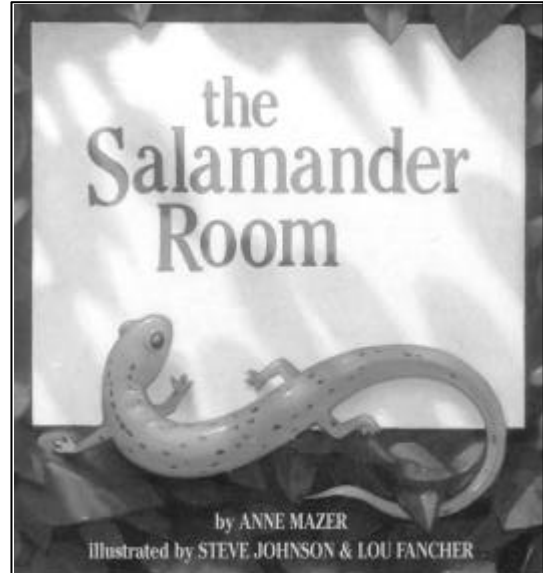


Ribbet's Review

By: Phung Tran

The Salamander Room

By Anne Mazer, Illustrations by Steve Johnson & Lou Fancer. ISBN: 0679861874
Published by Alfred A. Knopf, Inc. 1991



The Salamander Room is a story about a young boy who finds a salamander in the woods and decides to bring him home. The story is written for grades 1 to 3 and is beautifully illustrated.

When the boy brings the salamander home, he finds that the salamander needs many things in its environment that are different from the boy's room in order to live. The story explains the different requirements of a salamander and then follows through a simple food chain and the needs of other animals that can be found in the forest. Although the book does not indicate whether the salamander is released back into its natural habitat, the story suggests that the salamander belongs in the habitat where it was found (as the Adopt-A-Pond Programme recommends).

The simple story and illustrations combine to create a great read for grades 1 to 3. It is a story that will teach children that the needs of animals must be respected and we can live in harmony with each other.

Life in a Big Puddle

By: Phung Tran

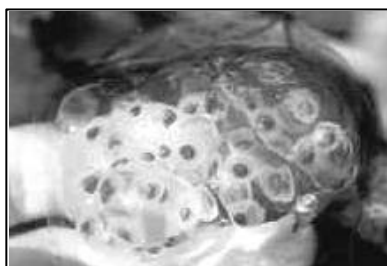
Wetland ecosystems, such as bogs, marshes and swamps provide ideal habitat for a vast number of plant and animal species. For animal species, wetland areas are used to reproduce, hibernate and forage for food. Some species rely exclusively on specific environmental conditions found only in ephemeral wetlands.



Ephemeral wetlands can be described as oversized puddles that hold water for a few days or months in the spring and summer but dry by late summer. The hydrology (flooding and drying cycle) of ephemeral wetlands and the organisms that use them make these wetlands unique.



Spring rain and snowmelt fill shallow depressions in the land in woodland and field ecosystems. But is every springtime puddle considered an ephemeral wetland? The quick answer is "no". Ephemeral wetlands are classified by the animal species that use them. These animal species are called **obligate species** because they depend exclusively on ephemeral wetlands and cannot use permanent water bodies for their lifecycles.



Ephemeral wetlands are classified by the species that live in them. However, even if the species required for an ephemeral wetland classification are not present then the pool may still be an extremely important part of a hydrological complex and a migration route for species of waterfowl, amphibians and reptiles.

Due to the temporary nature of ephemeral

wetlands fish populations are unable to be sustained. The absence of fish gives amphibian and crustaceans a survival advantage as fish are a major predator of amphibian spawn and tadpoles. In Ontario's ephemeral wetlands, obligate species include wood frogs, Blue-spotted and spotted salamanders, and fairy shrimp.

Wood frogs are the only frog species that depend exclusively on ephemeral wetlands for their survival. Wood frogs require pools for spring-time breeding. When male and female Wood frogs mate, they deposit egg masses on aquatic vegetation. Around mid to late April, eggs hatch and tiny, black tadpoles begin to feed on the leaf litter and vegetation in the pool. By late July tadpoles have completely metamorphosed into adult Wood froglets. Wood frogs will return to the same pool in a few years when they are sexually mature.

The Blue-spotted and Spotted salamanders (Ambystomid salamanders) are also obligate species of ephemeral wetlands. Like Wood frogs, salamanders come to the pool to breed in the early spring, usually during the first major rain event. Salamanders spend most of their lives upland from the pool and come down only to breed.

Salamander eggs and larvae develop quickly and they leave the pool before it dries.

Fairy shrimp are small crustaceans that spend their entire lives in ephemeral wetlands. They have very short lives and manage to mature and lay eggs before the pool dries up. The eggs are able to tolerate the dry phase of an ephemeral wetland by resting in the dry earth until the next season when the pool refills with water. Once the pool is filled with enough

water, the eggs will hatch and continue the cycle.

There are many reasons why these species can only survive in ephemeral pool environments. As mentioned above, there are no fish found in these temporary pools and therefore the animals and their eggs have less of a predation stress. Ephemeral wetlands are shallow and warm which is important for hatching amphibian and crustacean eggs. The water in vernal pools has low to moderate salinity (amount of salt) and alkalinity (the ability for water to neutralize acid), which is important to animals that have very sensitive skin, such as frogs and salamanders. These animals have adapted to the temporary nature of ephemeral wetlands by completing their life cycle or part of their life cycle before the pool dries. For example, the Wood frog and salamander eggs hatch shortly after fertilization and even in cold water frog tadpoles or salamander larvae develop quickly and leave the pool before it dries. The fairy shrimp have a very short life and the adults will die when the pool dries. Their eggs are able to overwinter and hatch the following season when the pool is flooded.

Although these obligate species are safe from fish as predators, the ephemeral wetland food chain is still complex. Many **facultative species** (animals that use an ephemeral wetland but can survive elsewhere) come to breed or feed in or near a pool and are very important to the ephemeral wetland community. Facultative species of an ephemeral wetland include Spring peepers and other frogs, turtles, raccoons, waterfowl, snails and a variety of insects.

Ephemeral wetlands are often part of a system of permanent and temporary wetlands. Their hydrological significance in terms of flood control and groundwater recharge is extremely important to us, as humans as well as wildlife. Ephemeral wetlands serve as landscape linkages for a variety of wildlife. They provide a stop over for migrating waterfowl where they can pair before using the more permanent wetland to nest. Amphibians also may use these areas as stop-overs on route to other permanent water bodies. Adopt-A-Pond's Snapping Turtle Study has shown that turtles rely on these areas for hibernation and spring foraging.



Vernal pools can be found all over the world and although they may look like oversized puddles, take a closer look, you might just find some Fairy shrimp, wood frogs or a salamander or two!

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Amphibian Voice is distributed to schools and communities participating in the Adopt-A-Pond programme. The purpose of this newsletter is to provide information on amphibian, turtle and wetland conservation issues and efforts in Ontario.

Send in your stories, drawings and photographs to the address below and we will "hoppily" include them in future issues.

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Support for the Adopt-A-Pond Programme:

Toronto Zoo Foundation
Canadian Museum Association
Human Resources Development
Canada

Adopt-A-Pond is a non-profit wetland education programme. Costs to produce this newsletter, and other resources, are funded by grants and private donations.

We welcome support of our programme! Please make cheques payable to "Toronto Zoo" and send them to the following address. Thank you!

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