

VERNALIS

Dorcas Bay Alvar Trip, Bruce County by **W.D. McIlveen**

The field trip undertaken by Ontario Vernal Pool Association on May 13, 2006 was an attempt to become familiar with a different type of vernal pool. Specifically, we wanted to take a first look at pools that develop in depressions in limestone alvars. It is well known to alvar enthusiasts that the pools present in the spring dry during the course of the growing season. This is a rather harsh environment for many species but seemed like something that would have relevance to the interests of OVPA. The Bruce Peninsula was a logical choice to start owing to the abundant alvars there.

Seven people were present for the trip that took place at Singing Sands National Park at Dorcas Bay. After looking at the boardwalk in the fen area we traveled along the old roadway to the northwest to

reach some of the more open sites. We had an opportunity to look at the flora and fauna (mainly migrating birds) along the way.

The area has both sandy areas in low dunes and bare limestone outcrops with little tree cover. The forest cover is dominated by Jack Pine (*Pinus banksiana*), Red Pine (*Pinus resinosa*) and Eastern White Cedar (*Thuja occidentalis*) but there are a large number of other species present as well.

We examined four pools in total. Three were relatively small pools on the alvar and the fourth, though not a true vernal pool, was located in sand dune at the edge of the lake shore and woods and had a small flow of water through it. It served as a good point of comparison for conditions in the alvar pools. (A subsequent visit to the site in August confirmed that the pools had indeed dried up).

The alvar pools had very limited vegetation cover. This meant that

there was no shading against the sun to keep the water cool as well as a limited opportunity for tree foliage to fall into the water and act as a source of nutrient energy for the pool residents. The effect of the sun on the shallow water (10-15 cm) is evident in the recorded temperatures. In the alvar pools, the temperature was 22.7 C° while the dune pool, though deeper (60 cm) and shaded, was 10.5 C°. The pH of the alvar pools at 7.6 was consistent with the presence of underlying limestone. The dune pool was only slightly less alkaline at pH 7.1

The alvar pools were noted to have mostly sedges as the vascular plant cover. The photosynthetic energy being held in the pools appeared to be dominated by algae in the pools. The algae appeared mainly as blocks of organic material from dried mats produced in the previous year. These blocks were now submerged in the present pool water.

...Continued on page 3

Under the FlashLight: Clam Shrimp

By **Stephan C Weeks, Ph.D**



The description "clam shrimp" has been given to a diverse assemblage of branchiopod crustaceans that were previously called "conchostracans." We now know that this group contains three distinct groups of temporary pool specialists: the Spinicaudata, the Laevicaudata and the Cyclestherida. The latter are closely aligned with cladocerans, while the others are morphologically distinct and distantly related branchiopods. However, all three groups have the distinguishing carapace that folds around their bodies to form a

...Continued on page 5



OVPA trip participants examine a vernal pool on alvar at Singing Sands National Park at Dorcas Bay, May 13, 2006. Photo: W.D. McIlveen

Meet the OVPA Executive

President	Scott Sampson 1-800-668-5557
Vice President	Karen Chisholme
Treasurer	Heather Lynn
Recording Secretary	Adrienne Duff
Membership Secretary	Michelle Sampson
Director-at-large	Bronwen Smith
Director-at-large	Teresa Rigg
Director-at-large	Bill McIlveen
Newsletter editor	Karen Chisholme

If you are interested in contributing to future issues of **Vernalis**, please contact OVPA via email or send your article and contact information via regular post.

How to Contact us

OVPA
P.O. Box 263
Norval ON
L0P 1K0

ovpa@sympatico.ca

or check us out on the web!

www.ontariovernalpools.org

or discuss the issues

<http://groups.yahoo.com/group/ovpa/>

New Guidelines for Protecting Vernal Pools During Forest Management Operations on Crown lands in Ontario

Ontario currently has more than 30 guides and manuals that address the conservation of biodiversity and the protection of the physical environment during forest management planning and operations on Crown lands in northern and central Ontario. The science behind these guides and manuals is currently being reviewed and updated; guidance will be amalgamated into 2 comprehensive guides that provide direction for strategic planning across broad landscapes (100,000s to 1,000,000s of hectares; the *Landscape Guide*) and operational planning and implementation within areas being harvested (10s to 1,000s hectares; the *Stand & Site Guide*). The overall framework and rationale for this work can be found in an MNR document entitled *Ontario's forest management guides: an introduction* which can be downloaded at the following website:

www.mnr.gov.on.ca/mnr/forests/public/guide/guides_intro_English.pdf

The *Stand & Site Guide* will contain direction on a wide range of topics from the management of deer yards to the protection of eagle nests. This guide will also contain direction designed to protect the integrity of vernal pools. Current direction for vernal pools on Crown lands in central Ontario is contained within the *Ontario tree marking guide* which can be downloaded at the following website:

www.mnr.gov.on.ca/mnr/forests/public/guide/tree_marking_guide.pdf

The *Ontario tree marking guide* (see pages 102-105) requires retention of forest cover within approximately 20 m of pools at least 200 m² in surface area. The

Stand & Site Guide will update this direction based on the latest science and expand its application to Crown lands in northern Ontario. MNR looks forward to input from the Ontario Vernal Pool Association during preparation of this direction.

All members of the OVPA will be able to review and comment on this direction and the entire *Stand & Site Guide* when a draft is posted on the Environmental Registry (www.ene.gov.on.ca/envision/env_reg/ebr/english/index.htm) later this year.

Brian Naylor
Site Guide Biologist,
Forest Policy Section,
Ontario Ministry of Natural
Resources

...Field trips con't

Only one amphibian, a Leopard Frog (*Rana pipiens*), was observed in the alvar pools and there was one egg mass identified as that of an *Ambystoma* salamander. By contrast, the dune pool had one Spring Peeper (*Pseudacris crucifer*), four Leopard Frogs, three Green frogs (*Rana clamitans*) and four egg masses of Spotted Salamander (*Ambystoma maculatum*). The larger of the alvar pools contained several species of invertebrates – larvae of caddisfly, mayfly, Chironomids, damselfly and dragonfly, as well as beetles and snails (to be identified). Relatively few invertebrates were noted in the smaller pools.



In addition to the larger pools examined, there were many much smaller pools in the shallow depressions in the rock. These were only a few centimeters deep and perhaps up to two to three meters in diameter. Undoubtedly, these would have very short lives and would soon dry out when exposed to the sun simply because they do not have sufficient water mass to sustain themselves and any assemblage of animals. Some vegetation might persist in such locations because the rock pores might hold enough water to sustain them through the driest periods. There were even tinier pools in the rock. These were only about two to three centimeters in diameter and were present where the limestone had eroded into 'pit karren'

topography. These micro pools, about the size of eggcups, would have correspondingly shorter lives. The small pool types just described fit the basic description of vernal pools – pools filled with water in the spring but drying through the season. Some might even sustain algae or very small invertebrates. It is clear that pool size is a very significant factor in determining the duration of functional aquatic vernal pool ecosystems. It seems alvar pools, being relatively simple ecosystems, when studied over a large gradient of sizes (the micro pools to pools much larger than we examined during the visit) would be a suitable method for determining critical pool sizes required to sustain ecosystems of various levels of richness and complexity.

Long Point on the north shore of Lake Erie, and is operated by the Long Point Conservation Authority. Backus Woods is in the Carolinian Forest Region and is home to many Carolinian flora and fauna species, including many provincially and regionally significant species.

The topography of Backus Woods consists of gently to moderately rolling sand ridges with wetlands and vernal pools scattered between the ridges. The forests were dominated by sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), red oak (*Quercus rubra*) with associations of white oak (*Quercus alba*), and eastern white pine (*Pinus strobus*). A couple of interesting species associated with the Carolinian Forest Region also observed on the hike included American witch-hazel (*Hamamelis virginiana*), tulip tree (*Liriodendron tulipifera*), black gum (*Nyssa sylvatica*), Canada waterleaf (*Hydrophyllum canadense*), and Wild Coffee (*Triosteum aurantiacum*). Tulip tree is Ontario's largest deciduous tree and gets its name from the large tulip-like flowers it produces in early summer.



Backus Woods Conservation Area, Norfolk County by Scott Sampson

On June 10th the Ontario Vernal Pool Association was off to Backus Woods Conservation Area in south-western Ontario. Backus Woods is located in Norfolk County near

...Continued on page 4

...Field trips con't

Floral species associated with the vernal pools of Backus Woods include silver maple (*Acer saccharinum*), yellow birch (*Betula alleghaniensis*), black ash (*Fraxinus nigra*), Pumpkin Ash (*Fraxinus profunda*), spicebush (*Lindera benzoin*), royal fern (*Osmunda regalis*), and marsh fern (*Thelypteris palustris*). Within the vernal pool, the group observed mosquito larvae, predaceous diving beetles, bloodworms, potential Jefferson salamander larvae, a burrowing crayfish (likely *Orconectes immunis*) and other species typical of vernal pools. The burrowing crayfish is a species that the OVPA has observed at a number of vernal pools in southern Ontario over the last couple of years. As its name suggests, these crayfish burrow into the ground and construct a mud chimneys at the burrows entrance. According to Donald A. Sutherland, Zoologist with the Ontario Natural Heritage Information Centre, there are three species of burrowing crayfish in Ontario. These species include *Orconectes immunis*, *Cambarus diogenes* and *Fallicambarus fodiens*. *Orconectes immunis* is known to use woodland pools, and the others are known to inhabit the edges of ponds, ditches, marshes, and wet meadows. In the near future, the OVPA will be looking at carrying out formal inventories of vernal pools to strengthen our understanding of the species that use vernal pools, including which species of crayfish are using vernal pools.

Vernal Pool Botany Hike to the Opavsky Tract, Halton Hills by Scott Sampson

One of the goals of the Ontario Vernal Pool Association is to strengthen our understanding of the flora and fauna associated with vernal pools. On past vernal pool hikes, much of our attention is focused on the amphibians, reptiles, and invertebrates associated with vernal pools, and

the flora of these pools are frequently overlooked. So on September 9th 2006, the OVPA held its first botany hike.

Plants are an important component of the vernal pool ecosystem. The surrounding trees shade the waters of the vernal pool thereby helping to keep water temperatures cool and reducing the rate of evaporation. The cooler temperatures help to regulate the metabolisms of the vernal organisms which is particularly important in oxygen-poor environments. The leaf litter from these trees has an important role in nutrient and energy cycling in these systems. Leaf litter and other

plant debris also provides critical cover and structure for vernal fauna. The caddisfly larvae uses shredded leaves and twigs to construct tubular cases around its body for protection. Fallen logs on the forest floor around the vernal pool provide cover for salamanders migrating to and from their ancestral breeding grounds; while trees that fall in the water provide basking structures for turtles and frogs, and act as perches for emerging dragonfly nymphs. Many vernal pool amphibian species attach their egg masses to submerged branches and vegetation. Invertebrate species like the predaceous diving beetle

...Continued on page 5

Scientific Name	Common Name	Native	Form
<i>Betula alleghaniensis</i>	yellow birch	Yes	Tree
<i>Betula papyrifera</i>	paper birch	Yes	Tree
<i>Fraxinus nigra</i>	black ash	Yes	Tree
<i>Populus tremuloides</i>	trembling aspen	Yes	Tree
<i>Thuja occidentalis</i>	eastern white cedar	Yes	Tree
<i>Tsuga canadensis</i>	eastern hemlock	Yes	Tree
<i>Ulmus americana</i>	American elm	Yes	Tree
<i>Cornus stolonifera</i>	red-osier dogwood	Yes	Shrub
<i>Rhamnus alnifolia</i>	alderleaf buckthorn	Yes	Shrub
<i>Rubus pubescens</i>	dwarf raspberry	Yes	Shrub
<i>Salix sp.</i>	willow		Shrub
<i>Sambucus canadensis</i>	common elderberry	Yes	Shrub
<i>Solanum dulcamara</i>	climbing nightshade	No	Vine
<i>Arisaema triphyllum</i>	jack-in-the-pulpit	Yes	Herb
<i>Symphotrichum sp.</i>	aster		Herb
<i>Epilobium strictum</i>	downy willow-herb	Yes	Herb
<i>Eupatorium maculatum</i>	spotted joe-pye weed	Yes	Herb
<i>Eupatorium perfoliatum</i>	common boneset	Yes	Herb
<i>Impatiens capensis</i>	spotted jewel-weed	Yes	Herb
<i>Lycopus uniflorus</i>	northern bugleweed	Yes	Herb
<i>Lysimachia nummularia</i>	moneywort	No	Herb
<i>Mentha arvensis</i>	wild mint	Yes	Herb
<i>Nasturtium officinale</i>	water-cress	No	Herb
<i>Scripus sp.</i>	bulrush		Herb
<i>Solidago rugosa</i>	rough-leaf goldenrod	Yes	Herb
<i>Typha sp.</i>	cattail		Herb
<i>Onoclea sensibilis</i>	sensitive fern	Yes	Fern

...Field trips con't

larvae will hide in vegetation to ambush passing prey such as a tadpole. Invertebrates and tadpoles feed on detritus (decomposing plant and animal matter) and other organisms.

September 9th was a cool and very rainy day; as a result, very few people joined us for the hike with the exception of a couple of die-hards. The Opavsky Tract is a property located in Halton Hills at the end of 17th Sideroad on the eastside of Highway 25, and is owned by the Bruce Trail Association. Many of the wetlands and vernal pools of the Opavsky Tract are the direct result of poor drainage associated with limestone outcrops of the Niagara Escarpment. The forests of the Opavsky Tract are dominated by sugar maple with combinations of white birch, large-toothed aspen, trembling aspen, American white elm, white cedar, hemlock and white pine.

Due to the unpleasant weather, the groups visited one vernal pool. At the time of the hike, the subject vernal pool was dominated by herbaceous wetland plants and red-osier dogwood. There was a little standing water in areas underneath the vegetation. On page 4 is a list of some of the floral species the group observed in the vernal pool. Unfortunately, the hike ended fairly quickly as a result of the weather. Over the next year the OVPA will be inventorying a number of vernal pools in order to improve our understanding of the biological composition of Ontario's vernal pools. If you are interested in botany and would like to share your observations, please contact the OVPA at ovpa@sympatico.ca.

... Under the Flashlight con't

"clam-like" shell. The bivalved carapace of clam shrimp is either completely spherical or oval-



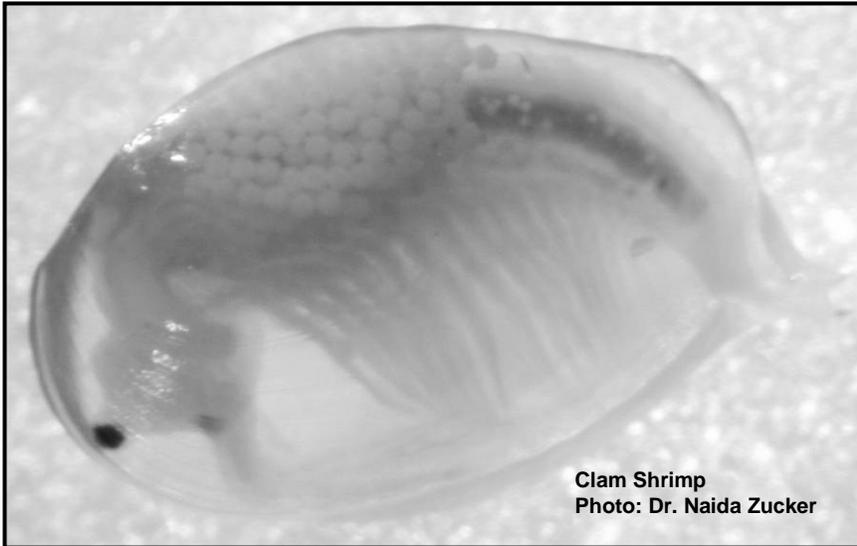
shaped and can be clear to dark brown. Clam shrimp, like other branchiopods, are a primitive group of crustaceans. The word "branchiopod" describes their numerous, undifferentiated flattened appendages. These are used for filter feeding as well as respiration, and in some species, limited swimming. Most of their movement is accomplished by the pair of second antennae which are used in a "helicopter-like" movement to swim through the

water column. Clam shrimp are filter feeders and omnivorous scavengers on the pond bottom. Clam shrimp either comprise males and females (dioecious), all females (parthenogenetic), all hermaphrodites, or males and hermaphrodites (androdioecious). Males are easily recognized by the presence of claw-like claspers with

**...Continued on page 6
... Under the Flashlight con't**



Clam Shrimp
Photo: Dr. Naida Zucker



Clam Shrimp
Photo: Dr. Naida Zucker

which they use to hold on to the females/hermaphrodites during mating.

Clam shrimp hatch from eggs (often termed "cysts") that remain dormant in the dry pool leaf litter and soil until hydrated. Eggs typically hatch in 1-7 days, depending on temperature, releasing a nauplius larva. Larval and juvenile growth is extraordinarily rapid under summer conditions. In warm water, clam shrimp can reach reproductive size in 4 - 7 days, although many species typically mature in 2-3 weeks (however, maturation can be significantly delayed by colder water temperatures). The females (or hermaphrodites, depending on the species) have a brood pouch located underneath the carapace that holds fertilized eggs. They bury these desiccation-resistant eggs within the top several millimeters of the soil. Eggs are white to light brown in color and are laid in a small burrow made by the female (hermaphrodite). Females/hermaphrodites produce thousands of eggs in their lifetime, generating clutches ranging between 100-300 eggs, one to two times a day. Clutch size increases significantly with body size.

Clam shrimp have a global distribution, being described from every continent except Antarctica, and are found in temporary pools

ranging in size from less than a square meter to many square kilometers (e.g., dry desert lakes). Clam shrimp are usually warm-water specialists, and thus they are mostly found in vernal pools from early May to mid September. There are some species that are found in snow melt pools at the end of winter in northern North America. Several species have restricted distributions and are considered rare.

Clam shrimp are easy to overlook: they tend to be on the bottoms of vernal pools, in among the leaf litter or actually slightly buried in the soil. However, they do occasionally swim up into the water column (*Lynceus brachyurus*, a broadly distributed species in vernal pools, is a filter feeder that commonly swims in the water column). Also, because they look much like small (4-20 mm) clams, they are often misidentified as freshwater bivalves. Thus, it is quite possible that those of us who frequent vernal pools have been in close proximity to these interesting critters many times without even knowing it!

Stephen C. Weeks, Ph.D.
Program in Evolution, Ecology,
and Organismal Biology
Department of Biology
The University of Akron
Akron, OH 44325-3908
scw@uakron.edu

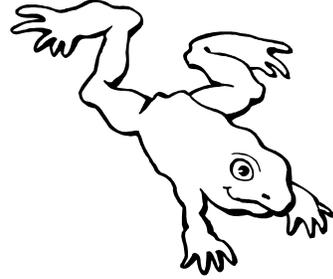
OVPA Annual General Meeting
April 21, 2007
Metro Toronto Zoo
www.ontariovernalpools.org

Check our website for details

Please enrol me as a member of the Ontario Vernal Pool Association

Complete the following form and mail to:

Membership Secretary
c/o Ontario Vernal Pool Association
P.O. Box 263
Norval ON L0P 1K0



Please print

Name: _____

Address: _____ City: _____

Postal Code: _____ Phone #: (H) _____ (W) _____

Email Address: _____

Signature

Date

Type of membership (check one):

Please make cheques payable to **Ontario Vernal Pool Association**.

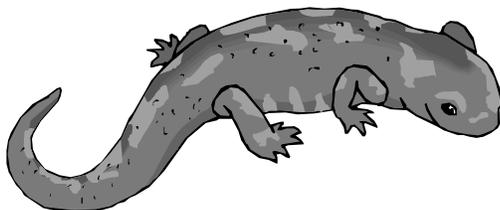
	1 Year	3 Year
Individual	\$20.00	\$60.00
Student*	\$15.00	\$45.00
Family**	\$30.00	\$90.00
Organization	\$30.00	\$90.00

Please send the OVPA newsletter to me via (check one):

- E-mail
- Regular Post

My interests include (check all that apply):

- Amphibians
- Reptiles
- Speaker Series
- Invertebrates
- Ecology
- Workshops
- Field trips
- Scientific Studies
- Other _____
- Volunteer opportunities
- Botany



I would like to make a donation of

- \$10.00
- \$25.00
- \$ 50.00
- \$100.00
- Other \$ _____

Member information will be kept confidential

* valid student ID required. **Family membership includes two (2) married or common-law spouses and up to two (2) children.

The OVPA assumes no responsibility for injuries of any kind sustained by anyone as a result of participating in any OVPA event.