



Photo: Elaine Hurst

LAURIER WOODS CONSERVATION AREA Newsletter

September 2009

Note from the President...

Laurier Woods at any time is a grand spot to visit. Since it is so close to the centre of the city it is easy to access; its trails are fairly flat and easily manageable. It has more than two miles of paths, some very new, that I bet you have not even tried, yet.

Personally I like the spring season the best, since it is then that new growth and activity is so prominent. Furthermore, numerous birds in their lovely springtime colours can often readily be found within the not yet so lush leaves and bushes.

But then again summer cannot be at all faulted. The trails are drier, pace seems less frantic and wild life has become more settled. The birds that have decided to nest are feeding young and one can often come upon them unexpectedly. Such interesting species as the Green Heron, American Bittern, and Belted Kingfisher pop up within the open swamps. A number of pretty warblers are about. This includes the Common Yellow-throat warblers often spotted just at the edge of the marshes; the black and orange American Redstart Warbler, and the one saying "very, very pleased to meet you!", the Chestnut-sided Warbler.

Of course by late summer the flowers and berries are in great profusion. One cannot fail to observe

Laurier Birding

Laurier Birding: May was another banner month for viewing spring migrants in Laurier. Observers in Laurier recorded 95 different species on the bird observation checklist at the Brulé St. entrance. This included 24 Wood Warblers being reported. This group of migrating warblers included very infrequent sightings of the Black-throated Blue Warbler, the Canada Warbler, Palm



Photo: Elaine Hurst

the purplish Witherod or Wild Grape, the perhaps misunderstood Purple Loosestrife, and under it all the odd mushrooms, such as Indian Pipe – or beware – the colourful and dangerous Amanitas. Fall season is now upon us. Once again change is prominent; the fall colours stay brilliant well into November; and the returning bird migrants with all their young create an even busier spot to conclude their identity. I won't even touch the loveliness of the winter season, yet – one finds it difficult looking forward to that time, despite its many pretty features.

It is hard not to enjoy a walk within our lovely Laurier Woods. But keep your eyelids up. There is much more to it than just pleasant exercise. Yes, Laurier Woods is enjoyable in all seasons! Go there!

Warbler, Cape May Warbler, Pine Warbler and the Northern Waterthrush. Broad-winged Hawks, a Merlin and Osprey were also observed. In the marsh area, a Virginia Rail, Sora, American Bittern and Green and Great Blue Herons also returned to Laurier this past spring.



Did you know?

That touch-me-not (also known as jewelweed) is a cure for poison ivy rash? This orange flowered plant can be spotted on the path at the Brulé Street entrance of Laurier Woods.

Board of Directors

Executive

Dick Tafel, President

Rick Tripp,

Vice President

Sue Miller, Secretary

Joyce O'Halloran,

Treasurer

Directors

Lori Beckerton

Ike Christ

Susan Christian

Dave Hackett

Bill Hagburg

David Haist

Terri Haist

Craig Hurst

Catharine Mayne

Peter Nosko

Fred Pinto

Paul Smylie

Troy Storms

Mary Young

The Nymphs of Laurier Woods come to Nipissing University

On one of the rare warm days this past June, recent biology graduate Mike Gemmel and animal care technologist Paul Smylie from Nipissing University found themselves collecting nymphs from the marsh in Laurier Woods for research at the University. The aquatic larvae of the dragonfly, known as nymphs or naiads, are being used by fourth year thesis student Lauren Auclair in her research examining the behaviour of tadpoles in response to predators after the tadpoles have been exposed to very low levels of the commonly used herbicide atrazine. Lauren is conducting her research under the tutelage of Nipissing's newest biology professor, Dr. Reehan Mirza. These large nymphs of the genus *Aeshna* belong to the family of large colourful dragonflies known as the 'blue darners' (see picture). After mating, the female of these most adept flyers and voracious insect predators, deposits her eggs along the surface of a pond or marsh where the eggs will sink and eventually hatch into small dragonfly nymphs. Dragonflies and damselflies which belong to the taxonomic order 'odonata' are hemi-metabolous, meaning they have only three life stages; the egg, nymph, and adult. Holo-metabolous insects such as beetles and flies have an extra pupal stage as well during which metamorphosis occurs before emerging as an adult. Depending on the species, the odonates will molt between 6 and 15 times, shedding their exoskeleton to make room for the growing



Aeshna Nymph

body beneath. After the final molt, the nymph will crawl up out of the water onto the stalk of a plant or dock etc. The exoskeleton will split open allowing the fully-formed adult dragonfly to slowly emerge as it unfolds its new wings in preparation for life in the air. The blue-darner nymph will spend 2-3 years in the

water, getting as large as 2-3 inches in length before becoming adults.

Most folks know that dragonflies are exceptionally efficient insect predators, taking mosquitoes and black flies and any other flying insects on the wing, doing so by scooping the little nastiest into a basket formed by their six legs. The superior predation skills are owed to their well-developed compound eyes and their manoeuvrability in the air – dragonflies can even fly backwards! Although the nymphs may lack the gracefulness of the adults, they are also an efficient predator. The odonates have an extensible lower lip, known as a labium with claws on the end that they can extend at lightning speed to grasp an unsuspecting prey. The labium, which folds up against the underside of the naiads head, works much the same way as a frog's tongue. Once in its grasp, the prey is manipulated into position and chewed apart by the nymph using its mandibles. Dragonfly nymphs eat a variety of aquatic insects as well as other aquatic organisms. Tadpoles, which have few defences against predators, just happen to be a favourite prey item of *Aeshna*.

This is where Miss Auclair's research comes into play. Lauren has collected the tadpoles of the Gray Tree frog, *Hyla versicolor* from a local pond this spring and is raising them at the University. The tadpoles are being reared in plastic tubs and exposed to varying concentrations of atrazine. Although it is likely that at high levels atrazine will kill frog larvae, what Lauren wants to determine are the sub-lethal effects of atrazine on the tadpoles at environmentally relevant concentrations of the herbicide. Specifically, the behaviour and sensory abilities of the tadpoles are examined at the different concentrations of 0, 3 and 30 parts per billion (ppb). The Ontario

drinking water standard for atrazine is currently 3 ppb.

As you now know, the nymphs that we caught in Laurier Woods like to eat tadpoles. In fact, the pond in Callander where the tree frog tadpoles were collected was also home to the nymphs of *Aeshna*, likely feeding on the abundant tadpoles. Many aquatic organisms, including tadpoles use chemical cues to detect food, predators and potential mates. When all systems are functioning properly, the tadpoles should display some kind of anti-predatory behaviour when they detect the smell of a dragonfly nymph.

Such behaviour may be to swim away fast, dive for cover or freeze so as not to be detected.

If in fact atrazine does have a deleterious effect on the chemosensory modalities of the tadpoles, then one would expect

that their anti-predatory response may be impaired.

To examine whether the sensory modalities of the tadpoles are impaired, Lauren will expose the tadpoles raised in the different concentrations of atrazine to water that the dragonfly nymphs have been living in. To ensure that the chemical essence of the nymphs will invoke a fear response in the tadpoles, the nymphs are fed tadpoles of the same species a couple of days prior to the testing. It has been documented that a predator will invoke a stronger fear response in a prey item if it has been dining on the brethren of that prey species. These tests are done under carefully controlled conditions. Lauren documents the behaviour of the tadpoles from each concentration of atrazine and then compares the behaviour of the tadpoles that haven't been exposed to atrazine (control group).

To test whether or not the behaviour of the atrazine-exposed tadpoles is altered, the tadpoles are given a choice test. In each trial, a tadpole is placed in the centre of a container which has a sponge soaked with the essence of dragonfly nymph at one end and a sponge soaked with distilled water at the other. If the tadpoles still have their wits about them, they will recognize the smell of the predatory nymph and will avoid that side of the container, choosing to spend time closer to the much less dangerous distilled water. If the olfactory abilities (sense of smell) of the tadpoles have been deleteriously affected by the atrazine, the tadpoles will not be able to distinguish between a chemical which signals danger, and one that does not. This will be displayed by the tadpole spending similar amounts of time on each side of the container, statistically speaking that is.

Atrazine is known to have other effects on developing organisms as well. This widely-used herbicide is known to be an estrogen mimic, meaning that it can cause feminization, altering the sex of organisms that are exposed to it. Miss Auclair will also examine her tadpoles using histology to see if there has been any alteration to the gonads (private parts) of those exposed to atrazine.

Amphibian populations are on the decline worldwide. Spending part of their time in water, and part on land and having permeable skin makes amphibians great indicators of ecological damage as a result of chemical contamination. Lauren's research hopes to put in place just one more piece of the puzzle in figuring out just why frogs and other amphibians are on the decline.



Blue Darner

Friends of Laurier Woods C/o North Bay-Mattawa Conservation Authority

15 Janey Avenue, North Bay, ON P1C 1N1

E-mail: cmayne@vianet.ca

You can show your support for the Friends of Laurier Woods by purchasing a \$20.00 annual membership!