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# CROAKS AND TRILLS



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## From the Editor



The Alberta Volunteer Amphibian Monitoring Program has a new toll-free phone number!

**1-877-777-FROG**

If you have any questions or comments regarding the AVAMP, or require assistance in determining the coordinates of your observations, please contact Kris Kendell at: 1-877-777-FROG (toll free), or 780-422-4764 (local); or by e-mail:

[kris.kendell@gov.ab.ca](mailto:kris.kendell@gov.ab.ca)

- or visit -

[www.ab-conservation.com/frog/monitoring](http://www.ab-conservation.com/frog/monitoring)

**Please remember to send in  
your data from!**

**Every observation is important!**

--- Kris Kendell

## What's a wetland worth?

*Lorne Fitch*

It wasn't much of a pond—a puddle in some minds. Most called it a slough, a somewhat demeaning term. It filled in the spring and slowly receded into a sea of foxtail by late summer. The cattle wallowed along the edges and created monstrous hummocks, dangerous to walk on top of and treacherous to navigate otherwise. As I remember it, as summer progressed a patina of duckweed and algae developed.



Mosquitoes swarmed out of the pond, to be met by ferocious dragonflies—the helicopter gun ships of the insect world. There was an olfactory aura surrounding the wetland—rich, earthy and often breathtaking. No cropland was harmed by its spreading waters; the loss of pasture was compensated for by a shorter walk for the cows to water and a band of lush, tall grass ringing the pond where the hidden water reached out for the roots. Willows created a near perfect doughnut in the saturated soil, and aspen flanked them, in the drier upland. The dead aspen were light enough for a boy to move and assemble into a raft. Dead aspen is a sponge, so the voyages were short and always culminated in wet feet, if not other body parts.

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## Wetland worth? (cont'd from page 1)

I yearned for more buoyant material to undertake longer voyages of discovery.

Much of us is water: about 65%. It is said that people born on coasts are subject to an irresistible pull back to water. “The ocean has an old allure”, they say, “to draw her exiles back”. Since all life began in the primordial soup of ancient oceans it is not surprising that we have some sort of genetic hard wiring to aid that allure. Even prairie-born and raised people display that attraction to water. Whether it was hard wiring, desperation or intrigue, the pond drew me as a kid like no other part of the farm. It also drew the first wave of ducks, mostly mallard drakes with the unmistakable metallic sheen to their heads. Every so often, in the early mists of morning, one could catch a glimpse of a deer drinking at its margins. A garter snake, surging out of the grass beneath one’s feet, generally got the pulse racing. Swallows collected mud for their nests built under the eaves of the barn. There was a cacophony of bird song: wrens scolding, warblers proclaiming that their perch was the best and a pair of red-tailed hawks that vocally resented each intrusion into their neighbourhood. Yellow birds, grey birds, brown birds and multi-coloured birds. I wasn’t to learn the theory until much later, but I knew if I wanted to see wildlife, the pond was the place. We know now that riparian areas harbour a disproportionately large share of Alberta’s wildlife, and that is part of their allure.



Someone with a strong arm could have thrown a rock across our pond, and at its deepest a person of medium height could have waded with impunity. However, to

a small boy its size, depth and workings were unfathomable.

It provided the auditory signal of spring, brought by chorus frogs. At our place, it wasn’t spring, officially, until their trills were heard. Stealth and patience were required to observe the males with their impossibly inflated sacs. An occasional great blue heron taught me those attributes.



The transformation of egg clumps to tailed larvae to adults was an independent lesson in biology, but where did they go when the pond dried up? And what creatures made those other swamp noises? Investigation, tinged with a bit of fear, showed the pond also had leopard and wood frogs. It was while I was crouching at twilight to observe these creatures that an orange sunset, reflected and framed in the water, found a permanent home in my memory.

So what is a wetland like that worth? Economically it’s hard to put a price tag on it, although we are getting better at valuing the significant ecological goods and services that wetlands provide. Could we do without wetlands? No! Beyond all the things we now know that wetlands contribute, that pond provided me with an education, experiences, risks, inspiration, entertainment, connections and appreciation. It was like thousands scattered through central Alberta; most are now gone. How many did we need? As we are slowly beginning to appreciate, most of them. My pond is still there and it is priceless.

Lorne Fitch, Provincial Riparian Specialist, Alberta Cows and Fish program [www.cowsandfish.org](http://www.cowsandfish.org) ❖

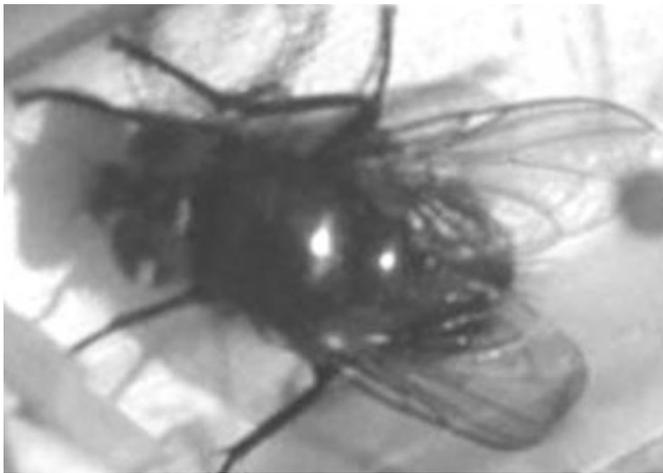
## Be afraid...be very afraid

By Brian Eaton

The lights dim and the creepy music starts. A buzzing sound, faintly heard at first, slowly crescendos and beats upon your eardrums. What is it? What is coming? A fly!

For theatregoers “The Fly” was a scary movie to which to take a date. Nowadays, suspense aficionados might rent the DVD to watch in their basement in the dark of night, clutching a butcher knife for protection and jumping at every creak and groan in their house. But for a frog, a fly is a different story. A fly is nutrition, borne on shining wings—a little package of energy, vitamins and minerals, and oh so very tasty...or is it?

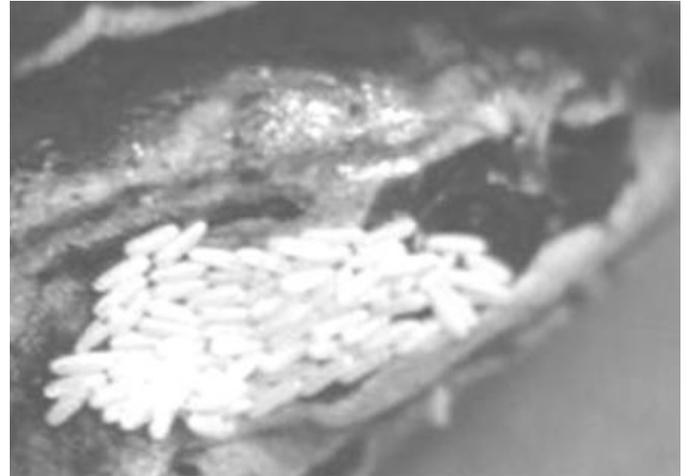
Sometimes flies turn the tables on frogs and go from the hunted to the hunter. During my Ph.D. research on amphibians in the boreal forest of Alberta, I found a number of frogs and toads that were attacked by a particular fly species called the green blow fly (*Bufolucilia silvarum*).



This small, blue-green fly (5-8 mm) actually likes to land on frogs and toads (seems like a short trip to genetic oblivion, doesn't it?). Why does it do this?

Well, this fly species is a parasite on amphibians and lays its fertilized eggs somewhere on the amphibian's body (usually the back or flank). Here the eggs hatch into tiny maggots that crawl around on the surface of the amphibian until they can burrow through the skin and into the flesh beneath. For example, on the back of one toad I saw a number of small maggots arranged

in a starburst formation (all of their heads were in the middle, and their tails pointed outward like the petals on a flower), as if they were cooperating in chewing a hole through the skin. Other reports suggest that maggots burrow through the integument separately and migrate under the skin to one location in the body.



However they do it, the fly maggots end up chewing a large hole in their amphibian victim. Favourite snacking areas for the maggots include the back, and the large muscles in the hind legs. As you might imagine, this is not a good thing for the amphibian; most die soon after they have been attacked, especially smaller individuals.

During my research, I found a total of 23 infested amphibians, including 8 wood frogs (*Rana sylvatica*), 2 boreal chorus frogs (*Pseudacris maculata*), 12 boreal toads (*Bufo boreas*) and 1 Canadian toad (*Bufo hemiophrys*). Of these, 15 died, 1 escaped, the fate of 3 is unknown (we removed the maggots from their bodies while the larvae were still small, then released the amphibians), and 4 survived the infestations. Although most afflicted amphibians die, when compared to the total number of amphibians we caught (2688) within our study area over a two-year period, it appears that only a very small proportion (0.86%) of the population is actually attacked by these flies.

In the movie “The Fly” the evil creature would vomit digestive juices onto its victims to dissolve their flesh. Green blow fly maggots cause liquefaction of their victims as well, leaving only an empty husk of skin and bones; the maggots crawl into the earth and

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## Be afraid... (cont'd from page 3)

pupate after they have eaten their fill. Because the maggots rapidly kill and consume the amphibians they attack, we may not encounter infested individuals very often. Therefore, we are likely underestimating the number of amphibians that play host to these flies, though it is probably still only a small percentage of the total population. Still, if I were a frog and I heard a buzzing sound, faintly at first, then slowly building, I think I would be afraid...very afraid...

For more information on this study please contact Brian Eaton (Alberta Research Council, Vegreville, AB): [brian.eaton@arc.ab.ca](mailto:brian.eaton@arc.ab.ca) Dr. Eaton's Ph.D. research was done under the supervision of Dr. Cynthia Paszkowski, Department of Biological Sciences, University of Alberta. ❖

## Amazing amphibians and remarkable reptiles!

- Perhaps the best known and most spectacular defence mechanism of lizards is tail loss, often referred to as tail shedding. Tails of most lizard species break off easily and some species can actually lose their tails voluntarily with minimal external force and by contracting muscles at the base of their tail. Nerves in the recently shed tail wriggle violently, diverting the attention of the would-be predator, and allowing the lizard to escape with its life.
- The saliva of the Komodo "dragon" (*Varanus komodoensis*), the largest living monitor lizard, harbours more than fifty different strains of bacteria, some of which are highly septic.
- Many species of male frogs and toads develop nuptial pads, special thickened structures on their hands that enable them to grip the slippery bodies of the females during mating.
- Approximately one-half of the world's frog and toad species breed in open water. Here they lay their eggs in clumps, long strings or floating rafts in shallow water, often attaching them to emergent and aquatic vegetation. Many species have exploited other breeding sites such as the water that collects in tree hollows or in certain plants,

such as bromeliads. Other species lay their eggs on land, near water, and some species even carry their eggs and tadpoles until they complete metamorphosis.

- Stories of frogs raining from the sky have some truth! Occasionally, frogs and other small creatures are picked up during storms, by tornados or "water spouts", and carried considerable distances before being dropped.
- The study of reptiles and amphibians is called herpetology. The word is derived from the Greek *erpeton*, which means "a creeping thing", and *logos*, which is "study". Herpetology, then, is the study of creeping things. Biologists that study reptiles and amphibians are known as herpetologists.
- Most amphibians do not die of old age! In nature their life spans can be very short. However, under carefully managed captive environments, with proper care, some species can live to a great age. For example, under captive conditions, African clawed frogs can live for more than thirty years, and the European common toad can live for more than fifty years! ❖

## There is a fungus among us!

By Damien Joly

Amphibian populations across the globe are declining because of habitat loss, pollution and over-exploitation. In some parts of the world amphibian populations have vanished so rapidly that the cause of the decline has not been conclusively found. Many scientists believe that a fatal disease caused by chytrid fungus (*Batrachochytrium dendrobatidis*) is responsible for some of these declines.

The water-borne chytrid fungus has been found on all continents except Asia and Antarctica and most likely originated in Africa. No one knows exactly how chytrid fungus spread across the planet. Intercontinental movement of African clawed frogs (*Xenopus laevis*), used in a pregnancy test for humans during the 1930-1970s, was the most likely route and is a widely accepted theory.

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## Fungus among us! (cont'd from page 4)

The African clawed frog appears to be the natural reservoir of chytrid fungus. To this day, the trade in African clawed frogs continues, as the species is used as a laboratory animal and is a popular animal in the pet trade.

The American bullfrog (*Rana catesbeiana*) has also been implicated as a possible source of fungus dispersal through the widespread production of frogs' legs as a gourmet delicacy in restaurants the world over. Most natural and introduced American bullfrog populations have been infected, and bullfrogs can carry, and subsequently transmit the fungus, without getting sick.



The American Bullfrog is the largest frog in North America and can obtain a body length of about 20 cm (8 inches).

Photo by Wm Stephen Price.

Another potential vector for the spread of chytrid is through the escape or liberation of African clawed frogs or American bullfrogs into the wild, resulting in the introduction of the fungus to native frog populations.

The spores of the fungus are spread in water, and when these spores come into contact with frogs and tadpoles they form a cyst and begin to grow in keratinized skin (keratin is the primary protein in the skin of amphibians).

Infected frogs become lethargic and lose their appetite, and their skin becomes discoloured and sloughs off. While the fungus is not a threat to human health, for infected amphibians, death usually occurs within a few days after they become sick. The fungus is thought to kill the frog either by releasing toxins into the frog or by damaging the skin to the point where the water balance of the frog is disrupted. Unfortunately there is no effective measure for control of the disease in wild populations.

Chytrid fungus has been reported in Alberta, but the current distribution of the fungus is unknown. All 10 species of amphibians in Alberta are potentially or known to be susceptible to chytrid fungus infection. Four of these species are or may be at risk of extirpation, and declines in two of these species in other jurisdictions are thought to be associated with chytrid fungus (boreal toads (*Bufo boreas*) in Colorado and northern leopard frogs (*Rana pipiens*) in British Columbia).

Consequently, there is a great need to prevent the movement of the fungus into Alberta. The greatest risk currently comes from the movement of infected amphibians; thus, wild amphibians should not be moved, and pet frogs should not be released into the wild.

Alberta Volunteer Amphibian Monitoring Program (AVAMP) participants can assist amphibian biologists in better understanding the occurrence of amphibian diseases in Alberta by reporting suspected amphibian deformities, abnormalities and large die-off events along with their annual data submissions, or by contacting the AVAMP coordinator directly.

For more information on chytrid fungus, please contact Dr. Damien Joly, Wildlife Disease Specialist, Alberta Fish and Wildlife Division: [damien.joly@gov.ab.ca](mailto:damien.joly@gov.ab.ca) ❖

## Safe havens for reptiles and amphibians

By Kris Kendell

Reptiles and amphibians often spend the day on the ground beneath objects such as rocks, logs and other debris. They are drawn to these shelters because of the microhabitats that are found beneath them—cool and moist or warm conditions. These sites also afford reptiles and amphibians protection from potential predators.

Turning cover objects over can be an effective method for detecting some species of reptiles and amphibians. However, searching under such objects can also be very destructive to this important, and often limited, habitat. Movement of such objects can crush reptiles, amphibians and other creatures sheltering underneath, resulting in serious injury or death.

If cover objects are turned over and searched under, extreme care must be taken and the object should always be carefully returned to its exact original position. Returning a cover object to its original position should begin with the removal of any animals encountered to avoid the possibility of crushing them when the object is replaced. Once the object is returned to its exact original position, the animals should then be released at the edge of the object.

When monitoring for amphibians in arid habitats or under dry, hot or windy conditions, cover objects should not be turned over or disturbed!



A young wandering garter snake is discovered under a piece of wood along the South Saskatchewan River, near Medicine Hat.

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**CROAKS AND TRILLS** is the official information newsletter of the Alberta Volunteer Amphibian Monitoring Program, a program delivered by the Alberta Conservation Association.

For more information on:

- the Alberta Volunteer Amphibian Monitoring Program
- amphibians and reptiles of Alberta
- how to submit monitoring data, or other amphibian and reptile observations

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