

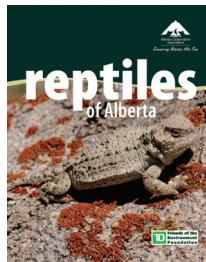
CROAKS AND TRILLS

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From the Editor

Copies of the new Reptiles of Alberta brochure can be obtained by contacting Alberta Sustainable Resource Development Information Centre:
1-877-944-0313 (toll-free); srd.infocent@gov.ab.ca



--- Kris Kendell

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Technicolor toads

By Zach Long

It is 3am July 2nd (2009), clear starry skies, fog hovering over a small wetland, and a light frost on the grass. Although I had spent the better part of three consecutive summers visiting this wetland every other day, I had never seen it quite like this... and it was a neat place to be following the Canada Day celebration in the nearby town of Whitecourt.

As intimidating as the prospect of walking through the bush in the dead of night was, I was greeted by this serene scene and felt completely at home. But I had come here for a purpose: tracking glowing toads.



Glowing toad: A female boreal toad coated with orange fluorescent pigment powder, exposed under UV light. (Photo: Stefanie van Huystee)

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Technicolor toads (*cont'd from page 1*)

Admittedly the toads didn't glow all on their own... they had a little help. A day earlier these radiant animals had been dusted with orange fluorescent pigment powder – the same pigment used to make high-visibility paint and highlighters. And all it took was an ultraviolet LED flashlight to make these brilliant animals luminescent. This is the essence of 'night tracking'.

I began a radio-telemetry study examining the effects of forestry activities on boreal toads (*Anaxyrus boreas boreas*) – a northern sub-species of western toad – in 2007, and quickly became fascinated by these animals and their habits.

These charismatic critters exhibit movement patterns consisting of bursts where they travel considerable distances over relatively short periods of time, followed by extended periods of rest. During these pauses, the toads establish themselves in one or a few nearby refuges, where they can be repeatedly found during their stay, and will return to after long absences. I knew these refuges were important to the animals, but I had no idea how they used or interacted with them.



Male boreal toad partially concealed in his refuge. (Photo: Zachary Long)

Because my radio-telemetry observations were made during the day, all I could say was that they tended to

occupy their refuges during the day. I was left assuming they'd leave at night to forage the surrounding habitat before returning to their cozy homes for the following day. It's a fair assumption, but this was a substantial gap in my knowledge of boreal toad natural history.

Since radio-telemetry only provides point data – the location the animal happens to be when you track it – simply tracking them at night would only give me a snapshot of their nocturnal activities. Instead, something was needed to 'connect the dots'. Enter the glowing toads.

The 'fluorescent powder / UV light' night tracking technique has been used on various reptiles and amphibians by researchers in the past, and has been demonstrated as a safe way of examining local scale movement. As a marked animal travels, it will leave a trail of fluorescent powder on the ground and on anything with which it might have come in contact. These paths, like the toads, glow under UV light. So you are able to see the exact path the animals' excursions followed.

The method of applying the fluorescent powder to the animal is an important consideration. The standard 'shake-and-bake' method – placing the animal in a bag with some powder and gently shaking it until the animal is sufficiently coated – is quite effective, albeit perhaps a bit traumatic. The toads protect their eyes by closing them, and any residual powder that might have come in contact is quickly wept away.

However, I was interested in how the toads interacted with their refuges, and this approach would likely cause them to flee, which would have been counter-productive. I found that if I deposited powder on the ground at the entrance of a refuge, the toads would sufficiently coat themselves upon exiting and re-entering. With either application method, the pigment would last for a couple days after which it essentially became inert and no longer transferred from the animal to its surroundings.

(*cont'd on page 3*)

Technicolor toads (*cont'd from page 2*)



Boreal toad refuge with fluorescent powder deposited at its entrance.
(Photo: Zachary Long)

As it happens, my initial assumption appears to hold; the toads do in fact leave their refuges at night to forage. From my observations in 2009, they ventured a rough average of 15 m away from their refuges before returning. Many individuals traveled along the tops of fallen logs, using them as local-scale movement corridors. And most toads left and returned following the same general pathways.

These sorts of observations are important for refining home range estimates, and the assumptions we bear regarding a species. As researchers, it is often tempting to let our assumptions drive our interpretations. But a purely investigative approach like this allows the animals to define their own world. We lose nothing by simply sitting down and observing the natural world carry on around us. Every new observation is gold.

So it was with low-tech solutions to high-tech problems, I was able to gain new insights into the natural history of a species of which I have become quite fond. All thanks to Technicolor Toads!

For more information on this study please contact:
Zach Long, PH.D. candidate at Lakehead University;
email: zlong@lakeheadu.ca ♦

Conserving amphibians using under-road tunnels in Waterton Lakes National Park

By Katie Pagnucco

Urbanization and the construction of roads is one way that humans are drastically changing the natural landscape. Without corridors to connect otherwise isolated areas of suitable habitat, habitat fragmentation can ultimately affect the size, health, and persistence of amphibian populations.

Amphibians require a complex set of habitats connected by suitable corridors to satisfy their life histories. For example, some salamanders migrate from terrestrial over-wintering sites to breeding ponds, and return after they mate and lay eggs. Salamander larvae grow in the ponds, dispersing into surrounding uplands during summer. If migrations intersect roads, thousands of salamanders from a single population may be killed while moving between habitats.

Linnet Lake in Waterton Lakes National Park was once home to a large population of long-toed salamanders (*Ambystoma macrodactylum*; a species of “Special Concern” in Alberta) that has recently undergone alarming declines.



Adult long-toed salamander (*Ambystoma macrodactylum*). (Photo: Katie Pagnucco)

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Under-road tunnels (cont'd from page 3)

This decline was linked to road mortalities of up to 44% of adults on the Park's entrance road, which separates salamanders breeding in Linnet Lake from over-wintering habitat.

In May 2008, four tunnels (the first in a Canadian National Park) were installed by Parks Canada under the entrance road to aid salamander movement between habitats.



Long-toed salamander (*Ambystoma macrodactylum*) entering one of the under-road tunnels in Waterton Lakes National Park. (Photo: Christina Buelow)

The project is a collaboration between the University of Alberta and Parks Canada. We hope to address the following objectives: 1.) mitigate road mortalities; 2.) calculate a population estimate for long-toed salamanders; and 3.) document amphibian tunnel use.

Road Mortalities: To prevent salamanders from reaching the road surface while also maximizing tunnel use, we installed drift fencing along both sides of the Entrance Road that runs parallel to Linnet Lake, angled towards tunnel entrances. Our fencing was effective in lowering rates of road mortalities, which decreased significantly compared to past years where fencing was not installed.

Population Estimate: We installed pitfall traps along the drift fences in order to capture migrating salamanders, which we then measured, marked and

released in an effort to establish a current population estimate. In 2008, we caught over 600 adult salamanders migrating to and from Linnet Lake, and we estimated the current breeding population to only 1/3rd the size it was estimated to be in 1994.

Tunnel Use: We installed motion-trigger cameras in each tunnel entrance in order to document tunnel use by salamanders and other amphibians. We also installed large pitfall traps at all 4 tunnel exits to capture all salamanders after successfully using the tunnels, since some salamanders might not trigger the cameras' motion sensors. In 2009, we photographed over 50 adult salamanders using the tunnels, and 112 salamanders were caught in the exit traps.

In conclusion, although the salamander population size has decreased significantly in the intervening years between the previous study and tunnel installation, salamanders will use tunnels to travel between aquatic and terrestrial habitats, consequently avoiding additional road mortalities. Further research is needed to determine whether or not these mitigation measures will lead to population persistence and/or recovery.

For more information on this study please contact: Katie Pagnucco; email: kpagnucc@ualberta.ca ♦

Amphibian factoids!

- Efforts to minimize impacts of roads on amphibians began in Europe, with the first amphibian tunnels being built in Switzerland in 1969.
- In the 2004 report “Disappearing Jewels: The Status of New World Amphibians” it was estimated that 89% of all threatened species of amphibian in the New World are affected by habitat loss.
- A few amphibians, such as Neotropical horned frogs, lure their prey by moving their toes to attract small frogs and other animals upon which to feed. ♦

Alberta Volunteer Amphibian Monitoring Program: 2009 results

Thirty-four individuals, organizations, and families contributed 217 amphibian observations and 6 reptile observations in 2009-10. These included records for 7 species of amphibians and 2 species of reptiles native to Alberta.

Volunteers provided information on 2 snake hibernacula locations and reports of 2 non-native reptiles (see Table below).

Species observed	Number of observations
Boreal Chorus Frog	60
Boreal Toad	10
Bullsnake	-
Canadian Toad	24
Columbia Spotted Frog	-
Great Plains Toad	-
Long-toed Salamander	-
Mountain Short-horned Lizard	-
Northern Leopard Frog	20
Plains Garter Snake	1
Plains Spadefoot	7
Prairie Rattlesnake	-
Red-sided Garter Snake	3
Tiger Salamander	11
Wandering Garter Snake	-
Western Hog-nosed Snake	-
Western Painted Turtle	-
Wood Frog	85
Snapping Turtle (non-native)	1
Red-eared slider (non-native)	1
Total number of observations	223

All data submitted by volunteers in 2009-10 have been entered into the Fisheries and Wildlife Management Information System (FWMIS) database.

FWMIS is a database maintained by Alberta Fish and Wildlife Division and used to store observational data on wildlife species within Alberta. ♦

Connecting to nature via frogs

By Heidi Eijgel

I met two very dedicated Alberta Conservation Association technicians last May, Megan Egler and Kelly Boyle. They had risen before dawn, driven to a local wetland in the Cypress Hills, put on their hip waders, readied their equipment and waded into the icy water to locate and collect northern leopard frog egg masses.



Northern leopard frog breeding site located in the Cypress Hills of southeastern Alberta. (Photo: Kelly Boyle and Megan Egler)

They then loaded everything up in their work truck and following a very detailed egg mass translocation protocol they traveled west across Alberta heading to Beauvais Lake Provincial Park with their precious cargo.

It was mid afternoon when my colleague Alison Cole and I met these technicians in the Park. They were tired, but still had a few hours of work to do acclimatizing the eggs into their new home!



Northern leopard frog eggs are closely inspected as they are prepared for acclimatization at Beauvais Lake Provincial Park. (Photo: Kelly Boyle)

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Connecting to nature via frogs (*cont'd from page 5*)

Northern leopard frog populations in Beauvais Lake, and across much of western Canada, declined sharply in the 1970s and scientists are still trying to determine the cause.

The Beauvais Lake northern leopard frog reintroduction project was initiated in 2009 and is part of a greater provincial reintroduction program to help achieve well-distributed, self-sustaining populations of northern leopard frogs throughout their historical range in the province.

It may take several years to determine if this reintroduction project has been a success. The project will include more egg mass relocations in 2010, along with tadpole counting and release, and monitoring of young-of-the-year and other age classes. We will also be monitoring for amphibian disease. This spring will be an important and exciting time to see if any of the juvenile frogs that completed their tadpole metamorphosis last summer survived the winter!



A young-of-the-year northern leopard frog from reintroduction stock introduced to Beauvais Lake in 2009. (Photo: Heidi Eijgel)

In the southwest corner of Alberta, we are known as the Crown of the Continent. Our wetlands, making up the Oldman watershed, could be considered gems in this Continental Crown. In fact, National Geographic selected the southwest corner of Alberta, southeast British Columbia and northern Montana as a location for a geotourism mapguide because the ecosystems protected here are some of the most complete of their kind left in the world. Time will tell, but Beauvais Lake may very well make the perfect home for reestablished northern leopard frogs! ♦

For more information on Beauvais Lake Provincial Park, please visit: www.albertaparks.ca

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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Conserving Alberta's Wild Side