
CROAKS AND TRILLS

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From the Editor



The Alberta Conservation Association has produced a brochure featuring the reptiles of Alberta. For information on how to obtain a copy of the brochure please refer to page six of this newsletter.

--- Kris Kendell

Do wind farms affect frogs?

By Kristi Anderson

When a naturalist thinks about the impacts of wind energy on the environment, a question that often comes to mind is: “How many raptors are killed every year from colliding with turbines?”

For some, once that question is answered few other questions come to mind. So far studies show us that other than in the Altamont Pass area of California, not many raptors are killed by turbines; but it is still a concern, particularly for raptors that are rare or endangered. Nevertheless, turbines and associated development has many direct and indirect impacts on wildlife, including amphibians.

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Turbines near Taber, Alberta (Photo: Callie Smith)

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Wind farms (cont'd from page 1)

A multitude of potential impacts

Amphibians can be affected by a wind farm development in several ways. Firstly, their breeding habitat may be disturbed by trenching for underground cables. The construction of access roads can disrupt dispersal corridors, and existing roads may experience increased levels of traffic, particularly during wind farm construction, leading to a greater potential for road mortality. Pollution of surface water can result from spills or leaks of lubricants and other potentially toxic substances. Lastly, the erection of a turbine near a wetland can change the local micro-climate through increased air turbulence.

Lessening the impacts

All of these impacts to wildlife can be mitigated through proper planning and attention to the issues during construction. For example, sensitive sites such as wetlands can be protected by removing them from the “developable” land of the project area. Another approach is providing a minimum of a 100 m setback distance (buffer) from any wetland. The intent of such actions is to protect amphibians and other species that rely on wetlands, by preventing any construction from occurring within the setback zone.



Amphibians, such as this tiger salamander, depend on wetlands that may be in areas where wind farms occur (Photo: Kristi Anderson)

Access roads can be routed around coulees that act as dispersal corridors for wildlife. When necessary to build the road through a coulee, a large culvert can be included in the design to prevent dispersal corridors from being cut off.

Mortality from increased traffic can be managed by enforcing a low speed limit, allowing creatures like frogs more time to react to the threat of a moving vehicle. At the same time, lower speeds may help drivers react accordingly to the presence of wildlife on the road. Limiting the number of vehicles allowed on site may also be helpful.

Planning for the wind farm development should include the production of an *Environmental Plan* to be followed by construction contractors. This plan will include all of the details related to environmental management during the construction phase such as where and how lubricants and other chemicals will be stored on site in order to prevent possible contamination of surface water.



(Photo: Kristi Anderson)

Air turbulence can result from wind flowing through a wind farm. When this happens, the local microclimate can become dryer as moisture in the ground is reduced by increased evaporation. This drying effect may impact amphibians that depend on moist microhabitats. A simple solution to this problem is to space turbines far enough apart to ensure that turbulence is not a problem.

It isn't easy being green

Wind energy development, like all electricity generation technology, is not without its impacts on the environment. Clearly, the ongoing replacement of fossil-fuel electricity generation with wind energy is a “greener” option, but careful consideration must be given to planning each wind energy development so that it has the lowest possible impact on amphibians and other wildlife.

Neodox Consulting (www.neodox.ca) ❖

Minimizing snake road mortality in Alberta

By Adam Martinson

In the past, the impacts of roads and vehicles on wildlife were rarely considered. However, recent studies have estimated that one million vertebrates are killed on roads every day in the US, and five million reptiles and amphibians are killed on roads each year in Australia! With impacts like these, the effects of roads on wildlife are hard to ignore.

The situation is no different in Alberta where prairie rattlesnakes and bullsnakes are commonly found killed on roads. Although we do not fully understand the impacts of road mortality on prairie rattlesnake and bullsnake populations in the province, there is every reason to believe that the impacts are significant. Even low levels of mortality can threaten populations because of the shortened active season and therefore reduced reproductive ability of the snakes.



Bullsnake road kill (Photo: Jim Knelson)

As a graduate student, I spent two years studying road mortality of prairie rattlesnakes and bullsnakes in Alberta.

My research focused on quantifying the magnitude of snake road mortality in southeastern Alberta, and more importantly, developing strategies to minimize the number of snakes killed on roads. Part of my research was estimating the probability of a prairie rattlesnake or bullsnake being killed when crossing a road.



Adam Martinson investigates a road kill rattlesnake using specialized tongs (Photo: Jim Knelson)

I had some shocking results. For example, I found that a prairie rattlesnake had an 18% chance of being killed when crossing a road that averaged just 353 vehicles per day! This unfortunate likelihood of being killed doesn't even consider the threats of any other roads, natural predation, or other human caused risk (such as inadvertently being killed by farm machinery).



Prairie Rattlesnake (Photo: Adam Martinson)

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Road mortality (Con'd from page 3)

Since prairie rattlesnakes are known to be quite mobile during their active season—one individual in Alberta was tracked moving 24 km away from its hibernaculum (den)—the cumulative risk of crossing numerous roads can be substantial.

Another component of my research was capturing and tracking prairie rattlesnakes and bullsnakes and comparing their movement rates to weather. Understanding how weather impacts snake movement is important because we can use this information to predict when snakes are most likely to encounter roads. Knowing when snakes are most likely to be crossing roads, we can develop strategies, such as temporary road closures, to ensure they safely get to the other side.

Other strategies to minimize the number of snakes killed on roads include providing sufficient buffers to road development around hibernacula, limiting traffic densities on certain roads, installing crossing structures for the snakes (such as tunnels, culverts, or cattle guards), and significantly reducing vehicle speeds.

The use of signs to minimize the number of snakes killed isn't likely to have a considerable impact because they have not been successful in other areas, where any positive changes to driver behaviour were temporary. Also, when some drivers are more aware of snakes on the road, they are more likely to deliberately hit them with their vehicle.

Clearly, for any mitigation strategy to be successful, it is important that people are educated about the issue, which in turn may increase the amount they care about the snakes and other wildlife. When people care more about these animals the likelihood of mitigation strategies, such as seasonal road closures, being implemented successfully is much greater.

For more information on snake road mortality and conservation efforts in Alberta, visit: www.ibrakeforrattlesnakes.com ❖

The quest to find the Alberta “horny toad”

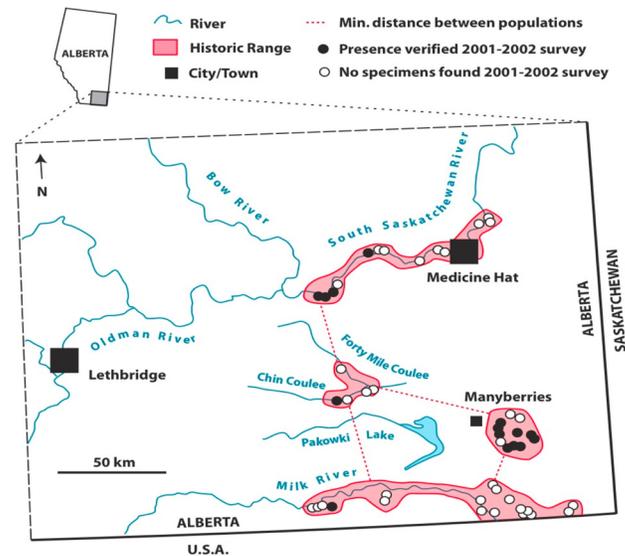
By Magdalene Leung

This past summer I had the privilege to search for Alberta’s only native lizard, the greater short-horned lizard (*Phrynosoma hernandesi*). Horned lizards (in general) are often likened to toads because of their superficial appearance (broad squat body, rough skin) and their awkward gait. This combined with their sharp projecting horn-like scales means this lizard is sometimes called a “horny toad”; despite the fact it is not an amphibian.



Greater short-horned lizard (Photo: Magdalene Leung)

In Alberta, the greater short-horned lizard is found in the extreme southeastern portion of the province.



Approximate distribution of the greater short-horned lizard in Alberta.

(cont'd on page 5)

Alberta “horny toad” (cont’d from page 4)

The greater short-horned lizard is Alberta’s only endangered reptile species and is listed as such under Alberta’s *Wildlife Act*. The survivorship of the greater short-horned lizard in Alberta depends on both specific habitat characteristics and the animal’s physical requirements.

For example, the greater short-horned lizard is only found along the rims of coulee slopes that are more often than not south-facing. These slopes provide the necessary conditions that enable it to thermo-regulate during the summer and to access appropriate burrowing sites for overwintering.

Viviparity, the condition resulting in giving birth to live young, may be another adaptation that allows these lizards to persist in Alberta. The advantage of viviparity is that the pregnant mother can optimize her basking time and thus accelerate the development of the young in her uterus, allowing them to be born early enough to acquire the necessary resources for overwintering.

My Master’s project at the University of Calgary involves determining certain genetic characteristics of these lizards that are important in understanding their population structure. My objectives this past summer were to (1) confirm the persistence of lizard populations in Alberta within the four population clusters: South Saskatchewan River, Milk River, Manyberries and Chin Coulee and to (2) collect tissue for use in genetic characterization.

The first hurdle that I had to overcome during the field season was to learn how to find this small cryptic lizard that has an average body length of just 70mm (for females) and 50mm (for males). No easy task.

Needless to say, countless hours were devoted trying to locate these lizards by slowly walking “good-looking” lizard habitat and being watchful for any signs of movement that the lizards would make. Over time, a search image was established and the rate of locating lizards increased.



Greater short-horned lizard habitat in southern Alberta (Photo: Magdalene Leung)

The second challenge was to learn how to perform the delicate tail-tip surgeries on these lizards that was required to obtain tissue for genetic analysis. Because the greater short-horned lizards is endangered, all surgical procedures must be performed successfully and must result in no loss of individuals and the ability to return them to the field in excellent health. Thus the learning curve was steep and surgical procedures had to be perfected in a short period of time.

The final hurdle I had to learn to overcome was how to survive southern Alberta’s unpredictable weather. Throughout the summer, I was exposed to a wide spectrum of weather situations ranging from blistering hot days (so hot that it didn’t register on a thermometer) to intense thunderstorms. The wildest weather that I experienced occurred one evening and introduced me to hurricane-like winds accompanied by a severe thunderstorm. The winds blew at 130km/hr and hit our campsite without any warning, leading to the destruction of all our tents!

Despite these challenges, the 2009 field season was very productive and great fun! I am eagerly awaiting the 2010 field season and the challenges that it may bring as I attempt to significantly increase my sample size.

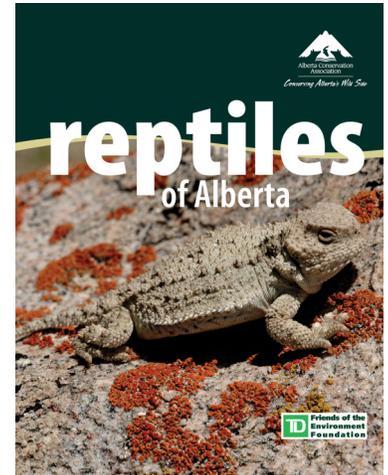
For more information on this study please contact: Magdalene Leung, MSc Candidate at the University of Calgary: Phone: 403-220-7258; email: leungmn@ucalgary.ca ❖

Reptiles of Alberta brochure

Reptiles are one of the most marveled and fascinating groups of animals on earth, not only because of the stigma, myths, and folktales that surround them, but also because of their beauty and fascinating behaviors.

The Alberta Conservation Association has created an educational brochure featuring Alberta's reptiles. The main purpose of the brochure is to get Albertans thinking about their attitudes towards reptiles (especially snakes) and allow them to become more familiar about Alberta's reptiles and their needs.

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



Amazing amphibian factoids!

- The tiny pebble toad (*Oreophrynella niger*) lives in mountainous areas of Venezuela. When confronted by a predator, it folds its arms and legs under its body, tucks in its head, and tenses its muscles, assuming a "ball position". If its defense strategy is executed on an incline, it will literally roll down the slope—bouncing down the rocks like a little rubber ball—away from danger and presumably to a safer location! The toad's small size and light weight mean that it is able to endure its tumble without injury.
- When the Spanish ribbed newt (*Pleurodeles waltl*) becomes agitated or perceives a threat, it pushes out its ribs until they pierce through its body, exposing the row of sharp rib bones! As the ribs protrude through the body, they puncture through an area of skin that is rich in poison glands, turning the bones into lethal spears and effective defensive weapons!

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