THE BRODIE CLUB

ROYAL ONTARIO MUSEUM OF ZOOLOGY

THE 1,035th MEETING OF THE BRODIE CLUB

The 1,035th meeting of the Brodie Club was held at 7:30 pm on January 19, 2010 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chairman: Robert Curry
Secretary: Ann Falls

The meeting was attended by 28 members and 7 guests.

Roll Call, Present: Abraham, E. Addison, R. Addison, Aird, J. Bendell, Y. Bendell, Bertin, Boswell, Bousfield, Crins, Curry, Dunn, A. Falls, B. Falls, D. Hussell, J. Hussell, A. Juhola, H. Juhola, Larsen, Lumsden, Machin, McAndrews, Reading, J. Rising, T. Rising, Slessor, Speakman, Tasker

Regrets: Fred Bodsworth, George Bryant, Jean Iron (away in Arizona), Ron Pittaway, Bill Rapley, and Kevin Seymour.

Guests: Paul Gray and Emily Addison, guests of E. Addison, Robert Ritchie Jr., guest of Rose Addison, Mandy Karch, guest of Bill Rapley, Dan Sutherland, guest of Bill Crins, Sharon Hicks, guest of Jock MacAndrews, and Dianna Wolf, guest of the club.

The minutes were approved with minor changes. L. Bendell corrected to J. Bendell, and speaker introduced by Ed Addison rather than by Bruce Falls.

Bruce Falls reported on the upcoming speakers. Nick Eyles will speak at the February meeting on "The making of a geologic journey around the world: six months on the road with the Canadian Broadcasting Corporation". David Evans will speak about the limnology of Lake Simcoe in March and the April speaker will be Bridget Stutchbury on the migration of birds.

Bruce elaborated on Fred's absence. In December Fred had an accident while driving. His car is a write-off and Fred was shaken up. He is recovering at home. Club members wrote well wishes to him and we do send our hopes that he will be feeling well soon.

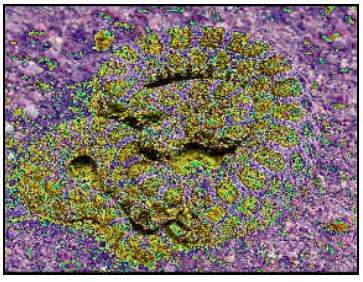
Bruce Falls made another request looking for a photocopied copy of "*A Pocket Full of Galls"*. This is a short biography of William Brodie which was lent to someone in the club and has not been returned. He is starting to think it was loaned to someone who attends few meetings!

SPEAKER:

Speaker Rob Willson was introduced by Ed Addison. Rob is a senior terrestrial ecologist with the consulting firm, RiverStone Environmental Solutions in Bracebridge and specializes in work on species at risk. Rob did a M.Sc. with Ron Brooks at the University of Guelph which makes Rob an 'academic grandson' to Bruce Falls who was present to hear Rob's presentation. Rob's graduate studies were on the ecology of snakes in the Point Pelee/ Pelee Island area.

Movement and Spatial Dispersion of Massasauga Rattlesnakes and Eastern Hog-nosed Snakes: Implications for Interactions with Roads

This talk included information gathered over ten years. The study was initiated by the need for impact assessment on reptile species due to the twinning of Highway 69 to form Hwy 400 in the Georgian Bay area and its extension through a pristine area from south of Mactier nearly to Parry Sound. It was not possible to get pre-disturbance data because the project was fast-tracked. Data were collected for five years in the main study area of about 1395 hectares (5 km across) just west of Mactier. A second study area south of this was 450 ha in size. The sub-populations in these areas did not mix.



Massasauga Rattlesnake
http://en.wikipedia.org/wiki/File:Masratt.jpg

The main species of interest was the Massasauga Rattlesnake (*Sistrurus catenatus*), but the Eastern Hog-nosed Snake (*Heterodon platirhinos*) is sympatric with it in the Georgian Bay study area and observations were made on it as well. Data were also collected on other species of snakes (e.g. Fox Snake) but are not included in this talk.

Eastern Hognosed Snake
http://en.wikipedia.org/wiki/File:Heterodon_platirhinos.jpg

Snakes are cryptic and hard to find, and telemetry proved extremely useful. Once a small transmitter and aerial were implanted surgically in a snake its whereabouts could be determined at distances up to one kilometer and it could then be followed daily. Thirty-four rattlesnakes and 14 Hog-nosed snakes were followed over a full season. Some individual snakes were observed over five years.

This technology enabled the research crew to make many interesting observations on life history. Rattlesnakes mainly prefer wetland and peatland habitat, sometimes floating mats, but also use rock barrens under some circumstances. The Eastern Hog-nosed snake is found in sandy, well-drained habitats with access to wet areas for their preferred food, toads.

Massasaugas are ambush predators as opposed to active foragers. They lie in wait for a prey species such as a mouse to pass by and then quickly strike and inject venom. The mouse dies in a few minutes. The snake then tracks it down using the scent trail and consumes it. By contrast, Hog-nosed snakes are active foragers. They prey mainly on toads of all sizes. We were shown a dramatic series of close-up photos of a Hog-nosed snake eating a large toad.

Radio tracking enabled observations of mating behaviour. Male rattlesnakes are quite oblivious of observers during courtship and mating. During gestation, females seek out open rock barrens to regulate body temperature. They can avoid extreme heat during the day by sheltering under large rocks while at night this microhabitat retains heat. Massasaugas are viviparous and give birth in August or early September to 12 or 13 young about 20 cm in length. Females usually stay around for about a week after giving birth.

By contrast Hog-nosed snakes are egg layers. They excavate a nest cavity in soil under rocks in late June or early July. One was observed to have moved about one km the day after laying eggs. The eggs hatch in September.

Defensive behaviour of the Hog-nosed snake is very dramatic. It tries intimidation first, expanding its ribs, making hissing sounds and flattening its neck to resemble a cobra. It may rear up and do some fake strikes with its mouth closed. If intimidation fails, it rolls over and pretends to be dead, lying still with its mouth wide open. It may even stop breathing, which makes its mouth turn blue. If you turn a Hog-nosed snake over, it may roll over "dead" again.

Primary predators of both Massasaugas and Hog-nosed snakes are mustelids, especially fishers. Radio transmitters enabled researchers to find one predated snake cached in cold wet soil and another in a crack in a tree several feet above the ground.

Historical records show that Massasaugas were once more widely distributed but now only a few isolated populations persist. Numbers are greatest in the Georgian Bay area, but they are also present in the Bruce Peninsula. A small isolated population exists in Wainfleet bog in southwestern Ontario where there are no roads. There is also a small endangered population in the Ojibway Prairie near Windsor. A map of road cover illustrated the high density of roads in southern Ontario, contrasted to the very sparse road coverage in the Georgian Bay area, and intermediate coverage in the Bruce. This suggests that interaction with roads may be important, but habitat change is also a likely factor.

Hibernation sites are important for predicting interaction with roads and telemetry made it possible to identify many of these in the study areas.

Telemetry data enabled researchers to study movements (rate, frequency, tortuosity), total distance moved, maximum distance from hibernaculum and maximum linear dispersion (range length).

Interactions with a new section of highway were studied before and after the highway opened. Before the traffic started, snakes did move onto the new road, but both species seemed sensitive, and to some extent averse to, vibrations caused by traffic. A Hog-nosed snake, which had previously crossed the new road, moved parallel to it for two weeks without crossing and stayed away for several months after traffic started. However, in mating season they are more likely to cross. The rattlesnakes seemed no less averse to vibrations but have greater site fidelity and habitat specificity, so they attempted to cross the new road. Hog-nosed snakes are not so habitat specific but their foraging strategy causes wandering that may lead to crossing the road.

A new finding was that when rattlesnakes disperse from a hibernaculum site they all tend to go in one general direction (within an arc of 75 degrees). Interaction with roads depends on the direction they choose. Maximum dispersal from the hibernaculum was 1.9 km (average 1.6 km). Gravid females moved less (max 700 m).

Hog-nosed snakes moved a maximum of 3.8 km from their hibernaculum, and dispersed in all directions – not good for road avoidance.

An attempt was made to use drift fences to prevent snakes from crossing the road or divert them to culverts but they managed to circumvent these fences. Infra-red cameras showed that culverts got limited use. The culverts were square concrete boxes and remained quite cool so reptiles may have avoided them for that reason. Some ended in the median which was not a safe place.

The study showed that roads have a big impact. Recommendations were made to MTO to modify some of their procedures and an attempt is being made to influence them to use these recommendations as they proceed with the highway extension up to Sudbury.

QUESTIONS:

Did you observe mortality during construction?
Yes. Construction vehicles ran over some. Blasting without mats to hold down the boulders meant large boulders were thrown which could cause damage to snakes or the habitat.

Do snakes exhibit territoriality?
Male rattlesnakes may be territorial during mating season but not later. They hibernate communally (in the same general area). It is thought they scent-track other snakes to reach hibernation sites. Young snakes were not radio tagged.

What is the fidelity of rattlesnakes to hibernation area?
It is 95%. Hog-nosed snakes do not show such strong fidelity.

Can snakes back out of a hole?
Yes, but with difficulty.

What is the function of the rattle?
It is a warning not to step on the snake. Many species of snake will vibrate their tails but rattles can make louder noise.

Does the number of rattles indicate a snake's age?
It indicates the number of shedding cycles, which may happen more than once per year. Rattles are made of keratin.

Have you been bitten by a rattlesnake?
Yes, once in Killbear Park. I was wearing a glove but it had a weak spot and one fang penetrated it. This was followed by a tingling sensation. Hand started swelling within half an hour. I observed this progressive swelling for more than 12 hours but when I started to feel nauseous I went to the hospital and got anti-venom shots. It was a classic case of how not to behave when bitten by a rattlesnake.

Describe hibernaculum.
For rattlesnakes – a wet conifer swamp, e.g. a hump at the base of a tree where a snake could go up and down with the water level. Also wet sphagnum pockets on rock barrens. Water is warmer than the air. Larger sphagnum areas could hold 200 snakes. Hog-nosed snakes are less communal and tend to hibernate halfway between wet sphagnum areas and rock barrens.

Have populations changed since the highway was built?
No data on this.

Recommendations to MTO re future roads?
They are willing to mitigate some features, e.g. no blasting without mats. But they don't necessarily ask.

The speaker was thanked by Bill Crins.

NOTES & OBSERVATIONS

Jim Bendell remarked on the phenomenal increase in Wild Turkeys. In the Almonte bird count 4 Ruffed Grouse, 10 Rock Pigeons, and 300 Wild Turkeys were seen. He wonders about the response of predators.

Bruce Falls had seen a Varied Thrush at Cold Creek Conservation Area.

Ed and Rose Addison had good sightings of four Timber Wolves. Two were observed running across highway 17 very close to the park office in Lake Superior Provincial Park. They had very full silver-grey ruffs. There was deep snow on each side of the highway and they "bounced' their way through. Two other wolves remained near a bit of open water and retreated into cover.

Ken Abraham sees a White-throated Sparrow daily at his feeder in Peterborough.

Bill Crins reported that the Christmas Bird Count in Algonquin Park on January 2 was noteworthy for low numbers. At least one participant saw no birds.

The meeting adjourned at 9.15 pm. Much discussion followed.

NEXT MEETING

The next meeting will be held on Tuesday, February 16th, 2010 at 7:30 pm in Room 432 as usual.

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CORRESPONDENCE

Hi, Here is this month's page. Cheers, and Happy New Year. Yorke

Birds Seen in Winter by the Sea

Robins - Two were with us through winter and were often seen on wires above our short street. Often in mornings it is singing its songs.

Northern Crows - Flying early near our house in most mornings, and it seemed to be for food as they fly over the sea shore near our house.

House Sparrow - At one small place near our road where food is there for birds, about 15 of them, noisy eating in the garden shrubs.

Glaucous-winged Gull - Always here, but in the fall our other kinds of gulls are often seen in groups going by, or resting on the shore.

Harlequin - Almost every day these ducks are seen in small groups and often near our shore. They live daily until their eggs are laid beside rivers.

Bufflehead - These small ducks are often swimming near our shore in mornings.

Red-breasted Merganser - These are big ducks seen in morning on the sea near our house, sometimes with loud calls.

Pelagic Cormorant - Watching daily I see a few flying over the water, usually frying low and going somewhere to catch some food.

Crow - Our crows live searching for food everywhere in our city, a few around houses, but most beside our food store places.

Canada Goose - They go swimming by our house going to a golf course by the sea. Early mornings I often see them eating on the grass.

Starling - In summer days they are scattered through the city nesting, but in winter they live together in crowds. I once saw 40 of them together.

Northern Flicker - Not often are they seen, but a few do come onto our garden trees, even in winter that is usually snow-less in our area.

Oystercatcher - We see them through each year, usually two together, and almost daily seen on small rocky islands near our shore.

Red-winged Blackbird - They sing daily in our early mornings, often on wires above the street, and live here through all the year.

Bald Eagle – On an island near our house, an eagle stands on top of a pole all day.