THE BRODIE CLUB

Established 1921

Website: http://thebrodieclub.eeb.utoronto.ca

THE 1,124th MEETING OF THE BRODIE CLUB

The 1,124th meeting of the Brodie Club was held on Tuesday, 17 December 2019, in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: Oliver Bertin
Secretary: Kevin Seymour

The meeting was called to order at 7:35 pm and was attended by 27; 24 members and 3 guests.

Roll Call:

Present: Abraham, Bacher, Beadle, Bertin, Coady, Currie, Curry, N. Dengler, R. Dengler, Dunn, Eckenwalder, Eadie, Harris, Hussell, Iron, Juhola, Kortright, Lindsay, Martyn, Pittaway, Riley, Seymour, Slessor, Thomas.

Guests: Gavin Miller (guest of Juhola), Mary Lou Jorgensen-Bacher (Bacher), Rosemary Haines (Thomas)

Regrets: E. Addison, R. Addison, Bell, Bryant, Crins, DeMarco, Dunlop, Hutchinson, King, LaForest, Moldowan, Obbard, Rapley, Rising.

Minutes:

Minutes of the November meeting were accepted (moved by Curry, second by Abraham).

Committee Reports:

The next meeting will be on 21 January, 2020, featuring David Agro speaking on "Conserving some of the world's rarest birds: the work of the Jocotoco foundation in Ecuador".

SPEAKER:

Abraham introduced the speaker: **Dr. Christina Davy**. She is a Research Scientist at OMNR with responsibility for Species at Risk.

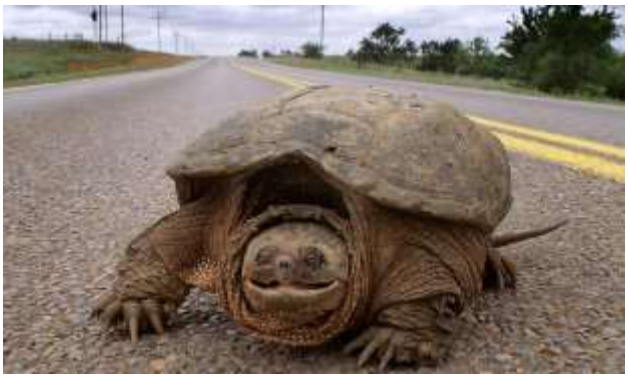
How to think Like a Turtle

With all the people and roads in southern Ontario, how are turtle populations connected and how can we maintain them? Davy's research into the genetics of turtle populations has shown that both the Spotted Turtle and Blanding's Turtle have genetically distinct, isolated populations that were present before Europeans arrived in Ontario. Even the more common and widespread Snapping Turtle appears to have genetically distinct sub-populations. There are four in southern Ontario: roughly centred in NE Ontario and Algonquin Park, Georgian Bay-Bruce County, Lambton, and Chatham-Kent. This result was unexpected given that Snapping Turtles are famous for dispersing

over land for many kilometers. Much of Davy's research centres on connectivity of Ontario turtle populations, and that was the subject of most of her talk.

Are there road kill hotspots for turtles? While turtles are certainly killed on roads, road kill hotspots shift location among years, making it difficult to evaluate the effectiveness of prevention measures. High levels of road kill probably mean there is a large population, but it isn't known whether road kill (or prevention thereof) has any effect on a given population.

Do turtles avoid roads? A large dataset on marked turtles was used to model likelihood of their moving across the whole local landscape. Results showed that turtles naturally crossed roads less than expected if movements were random, so yes, they do avoid roads. However, avoidance is not so great as to prevent road kills altogether. Road avoidance required the virtual turtles to walk 55% farther in a day, but that extra energy was relatively small, amounting to less than the cost of one egg.



Habitat loss is a bigger problem for turtles in general, and predation can be a serious issue. Snapping Turtles don't lay eggs until age 20-25 years of age. Thereafter the female lays eggs annually with no decline in old age – and they can live up to 100 years. Predation of eggs causes loss of one year's production, but loss of the turtles themselves can have a population effect. One raccoon that was attacking females as they laid eggs was found to have killed 2% of a local breeding population in a single year, which is significant given that reproducing females are much more valuable to the breeding population than are hatchlings and juveniles.

Turtle researchers have been "head-starting" baby turtles as a means of increasing recruitment to breeding populations, and Davy has been trying to determine whether it actually helps. Head-starting involves hatching baby turtles and feeding them in captivity for two years without any breaks for hibernation, then releasing them into the wild. Although the head-started turtles are much bigger than wild turtles of the same age, they suffer higher mortality once released because they have not been acclimated to the wild. Once acclimated, though, their habitat use, survival, growth rate, and use of space are not significantly different from that of wild turtles. If head-started turtles were supported during their release (acclimated in some way), then the head-starting technique is likely to be more effective.

For all of these kinds of studies, comparison with a wild population is necessary to learn whether interventions have had significant effects. Measures of before and after egg counts and visible mortality rates are commonly used for comparative study, but they are subject to serious bias.

1. Maternal investment does not equal fecundity, so you can't just count the number of eggs in a clutch. A certain proportion of every clutch fails to hatch, mostly due to infertile eggs; therefore a correction factor is required when projecting population growth.
2. Counting dead turtles does not measure population mortality rate. The actual rate depends on the size of the background population, such that a given number found dead could represent a very small proportion of a large population (low mortality rate), or a very high proportion of a small population.

Curry thanked the speaker for her insights into Ontario's turtle populations, and especially for emphasizing the importance of basing conservation action on sound science.

Questions following the presentation:

Dunn: How are you acclimating head-started young turtles?
A: We used to move them direct from tubs in the lab to release point. Now we put them in outdoor enclosures first, allowing them to forage more naturally, to get used to daily temperature fluctuations, and to become aware of small predators.

Coady: Do released Red-eared Sliders have an impact on native Ontario turtle populations?
A: In terms of ecology probably not, unless they introduce disease into a native population.

Ber tin: What is the best way to pick up a Snapping Turtle?
A: Hold the back of shell with one hand and put the other hand under the plastron for support. The head can't reach these areas. Picking them up by the tail alone can harm the turtle, particularly if they are large.

Eckenwalder: what part of the genome is sampled for population studies?
A: Primarily microsatellites.

Miller: Is there any evidence that genetically separate populations are in the process of speciation?
A: None of these populations is likely to be older than about 5,000 years due to the recent glaciation of Ontario, so genetic structure is perhaps more likely to have resulted from differences among individuals that repopulated newly accessible areas.

Curry: What is going on near the edges and between these genetically separated populations?
A: The next project is to sample some of these gaps to define the edges and find out exactly what is going on!

Bertin: Is it safe to snorkle in an area with Snapping Turtles?
A: Absolutely yes! Turtles underwater are quite docile.

Currie: Besides the DNA, are there other differences in these genetically separated turtle populations?
A: In terms of morphology, no, but there can be behavioural differences, such as the timing of nesting.

Harris: Has there actually been a mortality study with a turtle population of known size?
A: We are currently doing a multi-year study in Rondeau Provincial Park.

OBSERVATIONS

Dunn: There are at least a thousand Sandhill Cranes in the Long Point area at the moment. [Someone chimed in with "2000" – which is very likely.] They stay until cold and snow settle in for the winter.

Bertin: Where are all the Blue Jays? Responses: West Nile virus caused a severe drop in the local populations of Blue Jays and American Crows, and they are only slowly recovering. Local habitat change in neighborhood might play a role in decline.

Eadie: Why are Ravens moving south and Black Vultures moving north? Responses: Ravens were here historically, and their numbers are returning now that there is no more poisoning of carcasses to kill wolves (which also killed ravens).

Riley: A raccoon in Manhattan, NY recently caused a stir, as people there are not used to seeing them. [General chuckling followed, given the large raccoon population in Toronto.]

Coady: Showed a photo of a Northern Cardinal bilateral gynandromorph: male phenotype on one sice, female on the other and half and half when faced head-on.

Miller: Hatchling Snapping Turtle was seen in the fall at Tommy Thompson Park.

The meeting adjourned at 8:55 pm, followed by a lengthy period of visiting and enjoying Christmas treats. HAPPY NEW YEAR!

-30-