THE BRODIE CLUB

Established 1921

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

THE 1,079th MEETING OF THE BRODIE CLUB

The 1,079th meeting of the Brodie Club was held on Tuesday, 16 December, 2014 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: John Riley
Secretary: Ken Abraham

The meeting was called to order at 7:40 pm and was attended by 27; 25 members and 2 guests.

Roll Call:

Present: Abraham, E. Addison, R. Addison, Beadle, Bertin, Currie, Daniels, Dunn, A. Falls, B. Falls, D. Hussell, J. Hussell, Iron, A. Juhola, H. Juhola, Larsen, Lumsden, Machin, McAndrews, Obbard, Pittaway, Rapley, Riley, Speakman, and Tomlinson

Guests: Rob Falls (guest of B. and A. Falls), Sharon Hick (guest of McAndrews)

Regrets: J. Bendell, Y. Bendell, Bryant, Crins, Curry, Dunham, Eadie, J. Rising, T. Rising, Slessor, Sutherland

Minutes: Minutes of the November meeting as distributed.

Committee Reports:

Program Committee: On January 20th, Rob Cockcroft from McMaster University will speak to the Club on Astronomy in Ancient Egypt. On February 17th, Spencer Barrett of the University of Toronto Department of Ecology and Evolutionary Biology will speak to the club about Plant Sex in the Wild.

Announcements:

- Bill Rapley noted that he attended the 150th anniversary meeting of the McIlwraith Field Naturalists. They claim the 150 year heritage based on their founding as an entomological society. He also attended the 50th annual meeting of the Niagara-Bruce Trail Club. Bill announced the Rouge River Christmas Bird Count coming up.

- Harry Lumsden announced that on January 31st there will be a province-wide Trumpeter Swan count.

- Ken Abraham described a recent paper on neonicotinoid pesticide coating used on soybeans and corn which reported unexpected interactions of herbivorous slugs and their predatory beetles, which resulted in an actual decline in soybean yield rather than the putative increases claimed by the manufacturers of the coated seed.

SPEAKER: Marty Obbard introduced Brent Patterson from the Wildlife Research and Monitoring Section of the Ontario Ministry of Natural Resources and Forestry in Peterborough. Brent received his M.Sc. at Acadia University and his Ph.D. from the University of Saskatechwan. He worked on ungulates in the Northwest Territories before joining the MNR in 2001, where he is now the Ungulate and Canid Research Scientist for the province.

"Toward Science Based Management of Wolves and Coyotes in Ontario"

Brent's objectives for the talk were three fold: to examine the life history of wolves and coyotes in Ontario through the lens of his research over the past decade, to illustrate how several canid management issues are informed by that research, and to share some interesting natural history elements discovered along the way.

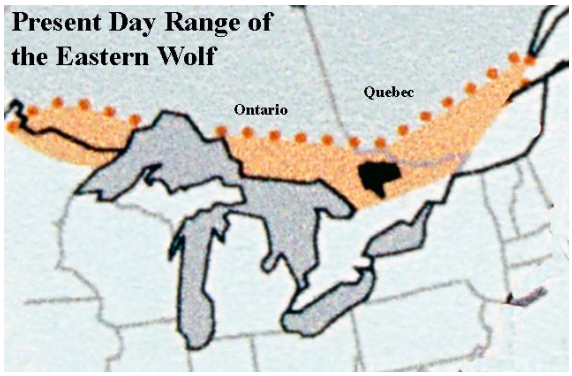
Ontario is unique in that it has a more eclectic community of canids than any other North American jurisdiction. We have Gray wolves, eastern wolves, coyotes and widespread hybridization of the latter two. Most people call all of them wolves or brush wolves.

Brent briefly reviewed the evolution of wolf management and research in Ontario. In 1793 a bounty was placed on wolves; the first coyote was documented in 1919 in Lambton County, and coyotes were immediately added to the bounty system. The bounty was abandoned in 1972 but there was still a year-round open season with unlimited bag. Research started in 1959 with Doug Pimlott's work in 1959, and radio collars were put on wolves for the first time ever (by Dave Johnston). In the late 1980s, John and Mary Theberge and Graham Forbes from the University of Waterloo conducted research on Algonquin Park wolves, documenting their seasonal movements following deer out of the Park where they consequently suffered high mortality. The researchers drew attention to the fact that this flagship provincial park was insufficient to protect wolves. In 1993, the first closed season on wolves in Ontario came into effect in selected townships around Algonquin Park; this was expanded in 2001 to the entire 40 townships bordering the Park. In 2004, the eastern wolf was declared a Species of Special Concern, and in 2005 the province released a Strategy for Wolf Conservation in Ontario. The McGuinty government pledged to do the science to get information needed for management.

Brent identified the research needs that he identified when he began his work with MNR. 1) Unravel the taxonomy and phylogenetic relationships of Ontario ungulates, determine the distribution of the species and hybrids, and determine what is a "brush wolf"; 2) Determine abundance of each type of canid by regions and ecozones; 3) determine relationships with prey species, including moose, caribou and domestic livestock; and 4) Inform emerging issues such as a) viability of wolves in Algonquin Park, b) separate management of wolves and coyotes in northern Ontario, and c) coyote predation on deer and livestock.

The chronology of his work illustrates these priorities. The first project focused on the status, distribution and sustainability of the eastern wolf in Algonquin Park. He then initiated work on wolf ecology in northern Ontario with a study in Horwood Township west of Timmins (in 2005) as part of a provincial census of wolves. Northern work also included coyote-wolf relationships in the Little Clay Belt. Southern Ontario coyote issues emerged in 2008-2009 and a project on urban-rural coyotes was begun in Prince Edward County which focused on how coyotes remained abundant in

the face of very high harvest mortality rates. Most recently, his research has included a project in boreal Ontario focusing on questions of wolf-moose-caribou-anthropogenic disturbance and a project on coyote depredation of livestock in southern Ontario.



Two major research methods have been constant in Brent's work: genetics and radio-telemetry. Trent has a well-established genetics research and forensic lab capability and he collaborates with a number of Trent faculty geneticists. For capture programs he takes advantage of the territoriality of canids and their use of roads and trails for movement within territories. They are extremely wary and the capture work with leg-hold sets requires the artistry of deception (use of gloves for handling all equipment, tarps to walk on, creative cover, and use of scent or scat from other areas to stimulate interest in the territory holders). He traps with Victor No. 3 soft-catch leg-hold traps, only in above-freezing temperatures in snow free conditions and uses sedating drugs to facilitate handling. For winter captures, a specialist capture company is hired; the company uses net-projecting capture guns from helicopters and no drugs. All captured animals are handled with a protocol that includes weighing and blood sampling for DNA analysis and disease analysis and tracking (e.g. parvo-virus).

The genetic investigations have revealed the following history of wolf evolution. The large Gray (or timber) wolf evolved in the Old World and migrated to North American across the Bering land bridge. Eastern wolves evolved as a New World animals in eastern North America and the coyote is also a New World animal. Eastern wolves do not have a black morph, and a black wolf that showed up in the Algonquin Park area and was killed near Haliburton was identified with genetic means as an immigrant from Timmins.

GPS collars have been critical to the success of the research on social organization, movements, habitat use and spatial dynamics. They remain on each animal from 1-2 years and have a release mechanism to drop the collars which are then retrieved by the research crew.

Both coyote and wolf social organization is based on the mated pair. Even in a wolf pack of 10-12, there would be one mated pair and the rest consist of an extended family of their offspring. Wolf offspring stay longer with their parents than coyote offspring. It is rare for coyote offspring to stay beyond the age of one year. There is a direct correlation between pack size and food availability. Unlike conventional wisdom, the animals that decide to leave a pack do so of their own choice, they are not driven off. To become a breeder, male coyotes or wolves virtually always have to disperse from the natal area.

Wolves are very thorough users of their territories, taking advantage of roads and trails which often form boundaries. Wolf territories vary throughout the province based on prey density with a general increase in size as one goes north (southern Ontario territories average about 150 km^2 while territories near Pickle Lake in northern Ontario average over 1000 km^2. This is directly related to moose density and the potential moose kills/wolf/day. Wolves compensate for lower prey density by occupying larger spaces. It was interesting to learn that in Ontario, wolves, coyotes and hybrids respect each other's territories, unlike in western North America where coyotes use interstitial spaces and are hunted and killed by wolves.

Differences between the species include pattern of prey selection and habitat use. Wolves are obligate ungulate eaters, whereas coyotes take a wide diversity of smaller prey, including anything from voles to deer. They need 1 kg/day of food. Voles can be killed at 7 to 8 per hour or 300-350 grams/hour. Larger bodied wolves need 2-3 kg/day and cannot sustain themselves on voles and lemmings. Both species usually take the least dangerous prey available. Many wolves that have been captured had healed fractures and bones, and the work has documented wolves being killed by moose in Algonquin Park. The research in far northern study areas around Auden, Pickle Lake and Cochrane used telemetry to monitor wolf kills. The results showed overwhelming take of moose (195 of 211 total kills), with only 7 caribou and 2 bears (7 kills were unidentified). A disproportionate number of the kills occur near roads and trails, as ease of mobility increases encounter rates of wolves with moose. Another finding was that wolves killed proportionately more old and vulnerable moose. A much higher proportion of wolf kills occurred among the 10+ age group and least amongst the prime adult group.

A parallel study in the same areas collared more than 150 caribou, of which very few were killed. There was high variability in rates of kill of moose by packs from 0-1 per 100 days up to 8 per 100 days. The most efficient pack killed more than 7 times the number of prey as the least efficient pack. Of course, larger packs tend to kill more prey than smaller ones, but not proportional to the number in the pack. Thus, larger packs have a lower per capita kill/day.

One conclusion of the research is that if wolf harvest was liberalized, packs would be reduced in size and the net result would be increased kill and consumption of moose. To increase moose, only removal of entire packs might help -- but that is not likely to happen. Brent also commented that the current moose harvest system that directs hunter kill toward calves may contribute to a "super additive" overall mortality of that age class.

One of the government's commitments in the conservation strategy was to estimate abundance of wolves in the province. Brent undertook a one-time survey to develop and empirical estimate, but also developed an index estimation method. The survey was adapted from an Alaskan "supercub" aircraft aerial survey method for track censuses. A telemetry based density calculation wherein the number of packs in a region is multiplied by the average number of individual/pack in that region resulted in a good match with the aerial survey. The provincial estimate is approximately 8000 wolves. The index used a survey of moose and deer hunters wherein the hunters reported the number of live wolves and coyotes they saw and their effort. This was used for a trend estimate which showed a low population in 2000 (linked to mange) and a peak in 2010, with a slight decline but a stable population since then.

Questions following the presentation:

Bill Rapley asked about the putative large size of the Coy-Wolf. Brent explained that the coyote expanded eastward into Ontario from its pre-European settlement range in the central plains of

North America. The first coyotes arrived in about 1919 and apparently almost immediately hybridized with the eastern wolf, which predominated in southern Ontario (as opposed to the gray wolf in the north). Brent said that all current coyotes in Ontario and to the east in Canada have some eastern wolf DNA and they are so similar that they can't be distinguished genetically. As a result, these hybrid coyotes are bigger than the original western coyotes (18-19 kg males, 16-17 kg females). He also noted that there is no evidence that these so called Coy-Wolf hybrids are behaviourally bolder and indicated that coyotes are just better at living near people than wolves.

B. Falls: Bruce asked about caribou-moose-wolf relationships in the Far North. Brent explained that the research is showing "apparent competition" whereby an increase in moose due to disturbance leads to an increase in wolves which leads to a slight increase in wolf kills of caribou. Even though the evidence shows that the caribou are incidental in the diet of wolves, this slight increase can tip the balance of caribou persistence in a disturbed area. It appears that a density of 6.5 wolves per 1000 km^2 is the tipping point of sustainable caribou.

Daniels: Sid asked a supplementary question about the size of eastern wolves. Brent said that male eastern wolves average 25-30 kg and females average 22 kg.

Ken Abraham thanked the speaker.

OBSERVATIONS

Jeremy Hussell related his encounter with piles of land snails lying on top of the snow near burrows while he was cross-country skiing after the big October snowfall. He did some research and discovered a 1906 paper in American Naturalist on the same phenomenon. It turns out that shrews hoard live snails in underground burrows as a last resort food cache. However, when the snow provides a better (colder) storage site, they move the snails out to keep them immobile. The research paper (http://www.jstor.org/stable/2454817) provides a fascinating glimpse of natural history research and field experimentation from 100 years ago.

NEXT MEETING

The next meeting will be on 20 January, 2015. Rob Cockcroft will speak on Astronomy in Ancient Egypt.

The meeting was adjourned at 9:40 pm.

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