THE BRODIE CLUB

Established 1921

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

THE 1,130th MEETING OF THE BRODIE CLUB

The 1,130th meeting of the Brodie Club was held on Tuesday, 13 December 2022 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: Ed Addison
Secretary: Kevin Seymour

The meeting was called to order at 7:37 pm and was attended by 31; 22 members and 9 guests.

Roll Call:

Present: E. Addison, Bacher, Beadle, Bertin, Bryant, Coady, Currie, N. Dengler, R. Dengler, Dunn, Eadie, Hussell, Iron, Kortright, Miller, Riley, Rising, Seymour, Stones, Sutherland, Thomas, Xamin.

Guests: Rachel Gottesman (guest of Kortright), Mary-Lou Jorgensen-Bacher (Bacher), Paul Xamin (Xamin), Nancy and Joe Mosiuk (Seymour) and student guests of the Club: Evan Hessels, Thomas Hail, Pascale Bider and Rowan French.

Regrets: Abraham, R. Addison, Crins, Dunlop, Eckenwalder, Falls, Lindsay, Martyn, McAndrews, Moldowan, Obbard, Peter, Pittaway, Sherry.

Minutes: Minutes of the November 2022 meeting were approved.

Committee Reports:

The next meeting, on 17 January, will be Patrick Moldowon, whose provocative title is "CORVID: A plague among turtles? Global case studies of corvids as subsidized predators of turtles, and discussion of a conservation conundrum."

Announcements: Bruce Falls being unable to attend, several members announced that they would be taking him a cake at his home the next morning, and that others were invited if able to come. *[See photos at end of newsletter.]*

Helen Juhola also welcomes visitors or calls (416-285-3666).

Ed Addison briefly reviewed the book "Sentient" by Jackie Higgins. (See Washington Post review here.)

SPEAKER: Colin Jones, National Heritage Information Centre, Ontario, was introduced by Rising. Colin is a provincial OMNR Zoologist in Peterborough, one of the authors of the "Dragonflies and Damselflies of Algonquin Park" as well as the ROM "Butterflies of Ontario" book.

"Ontario Insects: Assessment, Monitoring and Discovery in the Digital Age"

Colin briefly outlined the long and rich history of entomological study in Ontario, starting with William Saunders' co-founding of the Entomological Society of Canada in 1863. The establishment of three now large insect collections (Royal Ontario Museum, Canadian National Collection of Insects in Ottawa, University of Guelph) enabled studies on the insects of Ontario and Canada that are still relevant today. One example is the multi-volume "Odonata of Canada and Alaska," works published in the 1950s by Edmund M. Walker after labour of almost 70 years and still a valued reference today.

The last decades of the 20th century saw seven developments that radically increased the amount of entomological knowledge in Ontario.

- Game changer #1: **the personal computer**. This allowed an expansion of databases and inclusion of GIS locations. The Toronto Entomological Association started building a database of insect records in 2001, and in 2009 launched an online atlas. These efforts allowed people to see that their records were being used, stimulating additional record collection and demonstrate the importance of feedback to the contributing community.
- Game changer #2: **the internet**. This has allowed a number of online resources to flourish, such as bugguide.net and the Canadian Journal of Arthropod Identification. At the same time there are increasing numbers of high-quality printed identification guides. The ability of naturalists to identify insects increases their interest in looking for more and learning more about them.
- Game changer #3: **digital photography**. This has led to huge increases in the numbers of insect sightings recorded, as just about everyone has a digital camera now. The existence of photos provides permanent documentation of observations even if the observer had no idea what they were looking at.
- Game changer #4: **handheld GPS units**. Particularly in combination with #3, this has improved the quality of species records by ensuring that locations are precise and accurate.

In 1993, the National Heritage Information Centre (NHIC) was established, to maintain a dynamic spatial database of flora and fauna across Ontario. During the process of building and maintaining species lists for the province, a conservation status ranking is assigned to all species. The factors that contribute to these rankings include: the extent of the range of a species, the area of occupancy, the number of occurrences (a measure of the population), as well as threats and trends. The basic ranks are S1 (= rare) to S5 (= common). Besides those, there are also: SH (= historic), SX (= extirpated) and also SU (= unrankable, meaning not enough data to assign a rank).

In 1999 the National General Status of Wild Species was started, rolling up provincial and territorial assessments in partnership with Environment Canada. Reports are issued every five years. The first, in 2000, covered vertebrates, plants and butterflies. In 2005, crayfish, odonates and tiger beetles were added. In 2020 over 10,000 arthropod species were added, for a grand total of 29,890 arthropod species. However, the SU designation (too few data to rank) often accounts for a

significant proportion of the reported species. For example, from the latest report (2020), 61% of reported bee species had the rank of SU, as well as 31% of bee flies and 35% of hover flies.
In the formal assessment for insects, the following number of species were considered at risk: 5 beetles, 5 dragonflies, 12 butterflies or moths, 2 orthopterans, 5 bumblebees and 1 hemipteran. Sources of data for these assessments include museum specimens, published literature and field data collection. Data submission by community scientists has increased to the point that fully 40% of rare species records now come from them and this number continues to increase.

The latest trio of game changers include:

- #5: **the smart phone**
- #6: **mobile apps**
- #7: **social media**

These game changers has revolutionized the reporting of insect (and other) records from the community, particularly through iNaturalist, which was started in 2008. Its records consist of photos, date and location -- all searchable online. The subject of the photo need not be identified, and there is an active community of experts and volunteers who help with identifications and vetting of records. Between 2019 and 2021, the number of records reported by participants almost doubled, from 595,530 to 1,152,367, while the number of users in the same time period doubled to 30,000. To date there have been 1,373,384 reports of insects in Ontario reported to iNaturalist, for 9,372 species!

Colin gave several examples of species for which there had been few locations reported before the start of iNaturalist, but for which distribution maps are now being filled in by community reports. The Small cedar bark beetle, for example, was initially classified as S3, but newly accumulated records now show it is probably not rare after all.

Cicada parasite beetle
Sandalus niger

Similarly, some insects formerly with SU status have now been reported over wide geographic areas, suggesting they are probably not of conservation concern. For example, in 2019 there were only three records in Ontario of the Black cicada parasite beetle, but there are now 20 records in iNaturalist. Since the host of this parasite is Linne's Cicada, a search of the locations for this cicada might be a good way to locate more records of the parasite.

A final example was the introduced Box tree moth, first reported in North America in Toronto in 2018 on iNaturalist, and now shown by iNaturalist to be spreading geographically.

Box tree moth, *Cydalima perspectalis*

Questions following the presentation:

Bertin: How are observations in iNaturalist verified?

Answer: not only is there a community vetting process but known experts in various groups of organisms are utilized as well. 'Research Grade' designation in iNaturalist alone is not sufficient for NHIC to add those records to their own database.

Dunn: You mentioned "special features" are included in the NHIC reports. What are these?
Answer: These are communities such as alvars, grasslands and old growth forest areas, which are all known habitat types of concern; or they could be unique biodiversity areas. They are ranked in the same way as species.

Question: How can iNaturalist distinguish between species records that are widespread and abundant and those that are widespread but rare?
Answer: One way is to look at the habitat: if the habitat type is rare, such as an alvar, then this might suggest a species is limited to those rare habitats. Conversely if the species is difficult to observe but the records are widely dispersed in space and habitat, they may be more common than their observation rates suggest.

Follow-up question: What is the threshold for status determinations?
Answer: iNaturalist records are not sufficient for assigning status. All available information is consulted, including museum specimens and literature both old and new.

Rising: NHIC formed in 1993. Is there better funding for it now?
Answer deferred by Jones to Riley, who was involved in getting NHIC started. The conversation about the formation of this entity first started amongst professionals working in this area -- not at Queen's Park. Even amongst professionals, it was difficult to overcome the inertia of decades of focusing on single species management. Trying to engage biodiversity writ large was not easy. There were three years of internal discussions before NHIC was finally set up, and then more fighting to get the resources to complete the job. Federal contributions are minimal, as the National General Status of Species is really just a roll-up of provincial etc. status assessments.

Addison: It is often said that people like to count what can be counted, and it is easier to use binoculars than a microscope. How does NHIC deal with the tiny or microscopic organisms? Does some legislation define the organisms of interest?
Answer: No limits. Biodiversity is the mandate, and records of every kind of organisms are accepted. But as you'd expect, micro-organisms are almost totally unrepresented.

Bacher: How commonly reported are vernal pool species? Are these species an area of investigation?
Answer: NHIC relies on a whole network of reporters and the collective expertise of everyone, with only a few cases of specific investigation.

Follow-up question: What is the status of the Rusty-patch Bumblebee, which is present in Wisconsin but which appears to have disappeared from Ontario?
Answer: It used to be common in Ontario but there have been no reports since 2007. It may partially be in trouble because of pathogens spread from domestic greenhouse species. However, it is known to need a snowpack on the ground in order to overwinter. There may be sufficient snowpack in Wisconsin whereas recent warmer winters in southern Ontario may no longer offer that protection.

Eadie: Are there projects set up to locate more of certain types of things, for instance those that just seem to be lacking records?
Answer: Candidate species, such as those that may need a COSEWIC report in order to establish it as a species of concern, often can't move forward until more data are collected. So yes, in these

cases, if there are not enough data to move a status from SU to something else, field work specifically targeting that species may be needed.

Follow-up question from Dunn: Could a challenge project be set up on iNaturalist, asking participants to search for certain species?

Answer: Great idea!

Question: What are the next steps for improvements to NHIC: DNA barcoding? Environmental DNA?

Answer: NHIC may indeed consider these kinds of data in the future.

The speaker was thanked by Sutherland - who ribbed Jones for failing to mention another pioneer of entomology in Ontario: the namesake of our club, William Brodie. The speaker received a warm round of applause.

OBSERVATIONS

Bacher: Near the Skyway Bridge in Niagara there's a new heronry, with about 40 nests.

Riley: Noticed a superabundance of flies in Dufferin County, both biting and non-biting, near a Bald Eagle nest. Also there seemed to be a lack of Cluster Flies.

Rising: On Go Home Lake 3 weeks ago, a large group (about 100) of only male Common Mergansers arrived suddenly, and a similar invasion of all males took place a few days later. Sutherland noted that the males go to the far north of Ontario to molt, so these were probably returning from there after molting.

Bertin: noted reports of a highly unusual sighting of a walrus on the Isle of Wight.

Miller: noticed a Sandhill Crane in the Bender Tract near Newmarket, making a sound that was very raccoon-like.

Eadie: Was surprised to see a Common Raven at Queen and Shaw Streets-- more evidence of the recent southward expansion of this species.

The meeting was adjourned at 9 p.m., followed by good fellowship and good food, consisting of Christmas treats brought by members.

Post-script: Trudy, Oliver and Jean Iron visited Bruce Falls at his home on 14 December, bearing a cake (topped with a White-crowned Sparrow) to mark Bruce's turning 99 on the 18th**.**

From all your friends in the Brodie Club, Bruce, we send felicitations for your birthday and best wishes for a Merry Christmas!

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