

THE BRODIE CLUB



Established 1921

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

THE 1,083rd MEETING OF THE BRODIE CLUB

The 1,083rd meeting of the Brodie Club was held on Tuesday, 21 April, 2015 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: Bruce Falls

Secretary: Bob Curry

The meeting was called to order at 7:36 pm and was attended by 29; 25 members and 4 guests.

Roll Call:

Present: J. Bendell, Y. Bendell, Bertin, Bryant, Coady, Curry, Dunn, Eadie, A. Falls, B. Falls, J. Hussell, Iron, Kotanen, Machin, McAndrews, Peck, Pittaway, Rapley, Reading, Riley, J. Rising, T. Rising, Slessor, Speakman, Zoladeski

Guests: Cynthia Lee and Mary Kate Whibbs (guests of Rapley), Paul D. Smith (Curry), Sharon Hick (McAndrews)

Regrets: Abraham, E. and R. Addison, Carley, Crins, Daniels, A. and H. Juhola, Obbard, Sutherland.

Minutes: Approval of past minutes was moved by Bertin; seconded by Riley.

Committee Reports:

Ontario Nature: Glenda Slessor reported that The Youth Summit will again be held this summer. The hat was passed to support an attendee, and \$235 was collected of the \$300 needed. Members not present at the meeting who wish to make a contribution to this cause can contact Glenda by email or make a donation at the May meeting. In the meantime Slessor will write a cheque to Ontario Nature if it is required before that meeting.

Field Trip and Picnic: George Bryant reported on behalf of the Field Events Committee. The suggested date for the annual field trip is June 14 (same as last year) and location the 108 ha. Ontario Nature Cawthra Mulock Reserve just west of Newmarket.

http://www.ontarionature.org/protect/habitat/cawthra_mulock.php

There are walking trails, creeks, bridges, Clay-colored Sparrows and Eastern Milk Snakes. Bryant will scout the site and report further at the May meeting with a notice to accompany the May minutes. David Tomlinson has volunteered his place for lunch (bring lawn chairs) and a possible tour of nearby Aurora Wetlands Complex in the afternoon.

Program: At the May meeting (May 5) Shannon McCauley will speak on *Dragonfly Communities*. The September meeting will consist of members' presentations.

Announcements:

Bruce Falls talked of the recent sudden and unexpected death of long time Brodie Club member David Hussell. He read the following announcement, then called for all to stand for a moment of silence in remembrance.

“Since our last meeting we have lost a long-time and active member, David Hussell, who joined the Brodie Club in 1962. He died of a massive stroke on April 10th. Many of you will have seen David’s obituary and you can also read his own account of his interests and activities on the club’s website. David took part in the discussions at our meetings and recently spoke of his studies of Northern Wheatears in Nunavut.

For many of us David was a friend, a fellow naturalist and a thinker who followed his ideas through to actions. Dear to his heart was the Long Point Bird Observatory which he helped found in 1960 shortly after his arrival from England. He guided its fortunes through the years and invented many of its programs, including migration monitoring, population studies of Tree Swallows, birdathon, and the Baillie Fund, to mention a few. When some of these programs became national in scope David helped to found Bird Studies Canada. The world of ornithology and natural history owe a debt to David. We shall miss him.

We extend our condolences to Ricky Dunn and Jeremy Hussell who are with us tonight.”
(Photo by Ron Ridout)



SPEAKER: Ricky Dunn introduced Todd J. Morris. Morris is a Research Scientist with the Great Lakes Laboratory for Fisheries and Aquatic Sciences, Division of Fisheries and Oceans Canada (DFO). He is currently stationed in Burlington, Ontario at the Canada Centre for Inland Waters. He has been studying the *unionid* fauna of central Canada for the last 21 years. He is at present a member of the Biodiversity Science section of DFO and is responsible for leading DFO’s research program on freshwater mussel Species at Risk.



Dr. Morris is a founding member and chair of the Ontario Freshwater Mussel Recovery Team and is a member of the Committee of the Status of Endangered Wildlife in Canada (COSEWIC), Mollusc Subcommittee, the American Fisheries Society Endangered Mussel Subcommittee and the Freshwater Mollusk Conservation Society. His topic was:

ONTARIO’S FRESHWATER MUSSELS: A VANISHING TREASURE

WHAT IS A FRESHWATER MUSSEL?

Taxonomy

Phylum *Mollusca*: mussels, clams, snails, slugs, abalone, nautilus, octopus

Class *Bivalvia*: Bilateral symmetry, 2 hinged shells

Order *Unionoida*: Parasitic larval stage



Ecology

Mollusca are long lived, benthic, burrowing filter feeders. They cycle nutrients, transfer energy within ecosystems, provide habitat and clarify water bodies. In addition, they provide habitat for other stream invertebrates and stabilize river bottoms.

Morphology

Mussels come in all shapes and colours and often have bumps or ridges on their shells, especially in faster waters.

WHAT IS NOT A FRESHWATER MUSSEL?

Fingernail clams (*Sphaeriidae*)

Zebra and Quagga mussels (*Dreissenidae*)

Asian Clam (*Corbiculidae*)

GLOBAL DIVERSITY

842 recognized species worldwide

302 in North America (2 families)

54 in Canada (2 families)

In Ontario there are 30-35 species of mussels. Some species such as the Giant Floater (*Pyganodon grandis*) are common and widespread across Canada. Other species are quite restricted as they have colonized Ontario since the last glaciation. Thus several species in southwestern Ontario have migrated from the Mississippian Refugium while a few are from the Missouriian Refugium. In eastern Ontario are a few species from the Atlantic Refugium. The life cycle and specific reproduction tactics of the freshwater mussels can often take strange paths.

LIFE CYCLE

In general, the adult mussel releases conglomerates containing a cloud of glochidia (tiny embryos) into the water. The glochidia need a host fish for the next stage of their lives. One species, the Salamander Mussel, *Simpsonaias ambigua*, utilizes Mudpuppies. They attach themselves to the gills of the host fish where they mature into juveniles – up to 6000 glochidia per gill. On the host a cyst encapsulates the glochidia. After 15-20 days the glochidia transform to juvenile mussels that release from the host and drift to the bottom of the water body where they grow into adults. In some cases, the glochidia overwinter.



Conglomerates of Ouachita kidneyshell
(*Ptychobranhus occidentalis*)

The reproduction tactics employed by various species is where it gets really interesting, sometimes even bizarre:

1. Broadcast release (many glochidia, low cost, low success, host generalists)

The mussel releases huge amounts of glochidia into the water chancing that a suitable host fish might come swimming by. Work is continuing to develop an atlas of glochidia identification. Then, using a drift net, fish can be caught and the mussel-species-to-fish-species relationships can be determined.

2. Lures – when mussels go fishing (fewer glochidia, higher cost, higher success rate)

Some mussels have developed lures to attract host fishes. The fleshy protrusions of their mantle may take on the appearance of a wiggly worm or a small fry complete with eye spot and fins.

Some mussel species lure the fish first and when the host arrives they release the glochidia. An example of this type is the Northern Riffleshell, *Epioblasma torulosa rangiana*. The species is endangered throughout its range, which includes southwestern Ontario. Other species release the glochidia first and then try to attract the host (e.g., the Creeper, *Strophitus undulatus*).



Rainbow mussel (*Villosa Iris*) displays a 'walking crayfish' lure

Another North American mussel (not in Canada) squirts a stream of water into the air in shallow water. The water droplets hitting the surface cause ripples mimicking insect activity and thus attract the fish.



Brokenrays mussel (*Lampsilis reeveiana*)
Displaying 'fish' lure

3. Host capture (few glochidia, high cost, high success, specialists)

The Snuffbox, *Epioblasma triquetra* uses this most unusual tactic. It focuses on host fishes that forage on pebbly areas; for example, the Logperch. The fish nudges and rolls the pebbles in search of tasty morsels and if it happens to nudge a Snuffbox the mussel grabs hold of the fish with its jagged shell edges. It then releases the glochidia directly at the fish ensuring a very high success rate for gill attachment before the host is released.

CONSERVATION

Of the 54 species of freshwater mussels in Canada, 20 have been assessed by COSEWIC. Two-thirds of Ontario's mussel species are at risk of extinction.

Human activity is a major stress factor to the mussel populations. Historically mussels have been commercially harvested mainly for their shells; mother-of-pearl buttons were very popular before the development of synthetic materials in the 1940s. They were also harvested for freshwater pearls. Locally, thousands of mussels were pulled from the lower Grand River where the population has rebounded but not to their former abundance. Disturbances in waterways caused by dams, roads, agriculture, construction, etc., are other factors in the decline of the freshwater mussel populations.

Alien invaders, such as Zebra Mussels and Quagga Mussels, attach themselves to the shells of native mussels in large clumps, the weight of which can make the host mussel sink into the bottom silt and suffocate. These drysenids are levelling off in numbers so it is hoped that native species can survive. Fish species like the Round Goby, a molluscivore, out-compete native fishes. Introduced crayfish and the threat of several species of Asian Carp invasion present a serious risk to the freshwater mussels by direct depredation or depredation of the host fish species.

The good news is that there are potential areas for recovery in and around the Great Lakes (according to a study by the National General Assessment for Freshwater Mussels of 2004). Areas such as the Inner Bay at Long Point, the Bruce Peninsula, Lake St. Clair, the southwest end of Lake Erie and a couple of areas in Lake Ontario may serve as hotspots from which our native mussels may recover and expand to fill former portions of their range.

The Photo Field Guide to the Freshwater Mussels of Ontario is available at the [University of Guelph Bookstore](#). Or, an app for iPhones, but not yet Android devices, is available

Questions:

G. Peck. Can mussels reproduce asexually? Yes, some can.

Bertin. Are leeches predators of mussels? Yes, juveniles are at risk. Raccoons are major predators.

B. Falls. What's happening to the Drysenids? As with many aliens they boomed but are now settling back into lower numbers.

J. Bendell. There are lots of Mudpuppies at Oxford Mills so the Salamander Mussel should be there.

Dunn. Why are a lot of glochidia not transforming to adults on some fish species? Some fish acquire immunity to these parasites and the glochidia are sloughed off, but little is known of how this works.

Bryant. Where is the greatest species diversity of mussels in Ontario? The big rivers of southwestern Ontario and especially the Sydenham River.

Eadie. Are mussels still eaten by humans? They are tough and rubbery but some Aboriginal Canadians still eat a few.

Riley. Is there restocking of mussels in Canada? The MNR and the Toronto Zoo are engaged in projects to re-introduce mussels to suitable habitats. There needs to be more money to increase the scale of these operations.

Coady. Are there any extirpated Canadian species? One has been lost in Canada but it still occurs in the US.

G. Bryant thanked the speaker.



FIELD OBSERVATIONS AND ANNOUNCEMENTS

Dunn reported a Northern Cardinal pair feeding babies; this indicates egg laying about 1 April; that is very early.

Iron introduced her new Ontario Shorebirds Photo Identification Guide, proceeds from which go to the Matt Holder Fund.

Coady noted that there will be a Bat Night on 30 April at Thickson's Woods sponsored by the Matt Holder Fund. He noted a migrating Upland Sandpiper over his house; few are seen actively migrating in spring.

Rapley informed of a Great Horned Owl nest in Hamilton; a successful Beamer Hawk Watch Open House, both in terms of attendees and hawks; and May 9 is Migratory Bird Day when at the Toronto Zoo there will be club displays and guided bird walks.

Zoladeski noted flowering Spring Beauty on 14 April; Curry and Slessor observed that species plus Round-lobed Hepatica and Bloodroot in flower at Beamer Point, Grimsby on 17 April.

J. Bendell. Wood Frogs and Spring Peepers have been singing at Ottawa.

Reading is raising four Red Foxes at his home in Thornhill.

The meeting adjourned at 9:30 PM

NEXT MEETING: The next meeting will be on Tuesday, 5 May. Please note this is two weeks earlier than the traditional 3rd Tuesday of the month.

Shannon McCauley will speak on *Dragonfly Communities*.