THE BRODIE CLUB

Established 1921

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

THE 1,095th MEETING OF THE BRODIE CLUB

The 1,095th meeting of the Brodie Club was held on Tuesday, 18 October 2016 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: George Bryant
Secretary: Rose Addison

The meeting was called to order at 7:34 pm and was attended by 29; 22 members and 7 guests.

Roll Call:

Present: E. Addison, R. Addison, Bertin, Bryant, Carley, Coady, Currie, Daniels, Dunn, Eadie, A. Falls, B. Falls, Hussell, Iron, A. Juhola, H. Juhola, Martyn, McAndrews, Peter, Pittaway, Riley, T. Rising

Guests: Heather Speakman and Neil Macdonald (daughter and son-in-law of John Speakman; guests of Bertin), Peggy Haist (Bertin), Kathryn Falls (A. and B. Falls), Chris Boccia (U of Toronto student; Brodie Club guest), Patrick Moldowan (U of Toronto student; Brodie Club guest), Sharon Hick (McAndrews)

Regrets: Abraham, Beadle, Crins, Curry, Dengler, Kotanen, Machin, Obbard, Peck, Rapley, J. Rising, Seymour, Slessor, Speakman, Sutherland, Tomlinson, Zoladeski

Minutes: Minutes of the last meeting were accepted as distributed (moved by Bryant, second by another member)

Committee Reports:

Treasurer's Report

Incoming Treasurer George Bryant advised dues (10$ single, 15$ couple) are collectable today.

Membership Committee

Dunn reported that average attendance at meetings last year was 25 members and 7 guests. R. Addison and J. Hussell attended all meetings (this makes four consecutive years for Jeremy!). Carolyn King and Nancy Dengler were elected as members. Ed Bousfield, a member since 1990, passed away in September.

Program Committee

E. Addison reported for the Program Committee.

Erica Nol from Trent University will speak at the November 15th meeting. Her title is "Songbirds in the settled landscapes of Ontario: how will they survive?"

Peter Mills will speak in December. Please note the meeting has been brought forward by a week so it will be the second Tuesday, **December 13**. Mills will speak on work for his recently published book Metamorphosis: Ontario's Amphibians at all Stages of Development.

Brodie 1100 Meeting (March 14, 2017)
Bryant reported on behalf of the committee. Plans are to book Arts & Letters Club, 14 Elm St. just north of Yonge and Dundas for 5:30 pm. (website: www.artsandlettersclub.ca)
Eadie announced that Michael Runtz – author of *Wild Wings: The Hidden World of Birds* and many other publications – will be the speaker. He has been a Seasonal Park Naturalist at Algonquin and gives very popular courses on natural history at Carleton University. Members group photo at 6 pm, banquet dinner at 7, and program at 8. Cost will be $80. At the 1000th meeting there were 43 members and 50 guests. The 1100th meeting is a special event with an outstanding speaker and all members are encouraged to bring guests. Registrations to be distributed shortly.

Refreshments Committee
T. Rising thanked Bertin for his years of service. Coffee will remain at end of meeting; members can bring coffee with them if they wish it earlier. Rising and R. Addison to look into biodegradable cups. A shelf has been made available for members who wish to bring and leave a personal mug.

Annual Meeting

Elections:

Secretary Editing	Justin Peter
Secretary Corresponding	Ricky Dunn
Secretary Recording	Ken Abraham, Ed Addison, George Bryant, Sandra Eadie, Kristen Martyn, Kevin Seymour
Treasurer	George Bryant
Membership	Ann Falls, Bill Crins, Trudy Rising
Program	Ed Addison, Bruce Falls, Hugh Currie, Marc Johnson, Don Sutherland
FON Reps	Bob Curry, Glenda Slessor
Archives	Ricky Dunn, Sandra Eadie, Kevin Seymour
Refreshments	Trudy Rising, Nancy Dengler, Sandra Eadie, Sharon Hick
Web Site	Ricky Dunn, J. Hussell
Field Trip	Hugh Currie, Bob Curry, Ron Pittaway
AV	J. Hussell, Ricky Dunn
1100th Meeting	Bryant, Dunn, Eadie, Peter, Currie, B. Falls, E. Addison, R. Addison

Treasurer's Report: Outgoing Treasurer Arne Juhola moved that the 2015-2016 report, included in the September minutes, be approved. Seconded by Dunn. Carried.

Currie made a motion to approve, seconded by Hussell and approved.

New Business:
Bruce Falls explained the Faculty Club is regularizing use of cards and will issue a Brodie Club card for members to use on meeting nights.

SPEAKER:

Trudy Rising introduced the speakers, Fred Schueler and Aleta Karstad. Fred graduated from Cornell University, and came to Toronto to work with Jim Rising. He became fascinated by the geographic variation in the Northern Leopard Frog and switched from birds to amphibians. He followed his PhD work with a post-doc at the National Museum of Natural Sciences (now the Canadian Museum of Nature).

Aleta Karstad has been a naturalist since her youth. She studied art at Central Technical School in Toronto, obtained a contract with the National Museum of Canada as a biological illustrator shortly thereafter, and has been a painter of and writer about the natural world ever since.

Fred and Aleta met early in Fred's tenure in Toronto, married, and travelled across Canada before moving to a small village south of Ottawa at the time of Fred's post-doc at the National Museum. Since then, they have been self-employed and pursue their passions: the preservation of wildlife, the education of others about natural history, and the writing and illustration of a number of books on natural history. They set up the Bishops Mills Natural History Centre**,** they sit on a number of fish and wildlife committees, are a part of the Department of Fisheries & Oceans' Freshwater Mussel Recovery Team, and Fred is on the board of the Ontario Road Ecology Group.

Their primary mission has turned out to be to teach people to recognize and value common but neglected species.

Schueler and Karstad opened their presentation with an audio-visual presentation of Fred's original song, "Mudpuppy Night at Oxford Mills". The text is reproduced here:

The dam in Oxford Mills has got an ancient pedigree:
The province nearly tore it down in 1963
Repaired, it bars the Rideau Carp from running up the stream,
Any stymies springtime Mudpout to support a fishery.

The summer creek below the dam is golden, clear, and warm.
Pearly Clams and twiggy Caddis larvae root around,
Red-eyed Rock Bass fan their fins behind each standing stone,
And giant neotenic mothers guard their broods alone.

In August when the gold-striped offspring leave the nest at last
There's no idea of hibernating to let winter pass.
Their mating season (no one's seen it) may well be a blast,
And everything that moves becomes their wintery repast.

Salamanders generally do well when it's cool
(Ambystoma walks over snowdrifts on its breeding stroll),
And these aquatic wanderers are faithful to this rule:
They fatten up on ice-stunned fish in riffled and in pool.

Below the dam in January, on the bedrock floor,
At first you just see one, and then there's more and more and more,

Stepping with their little feet and stubby fingers four,
They fan red gills and flex broad tails beside the spillway's roar.

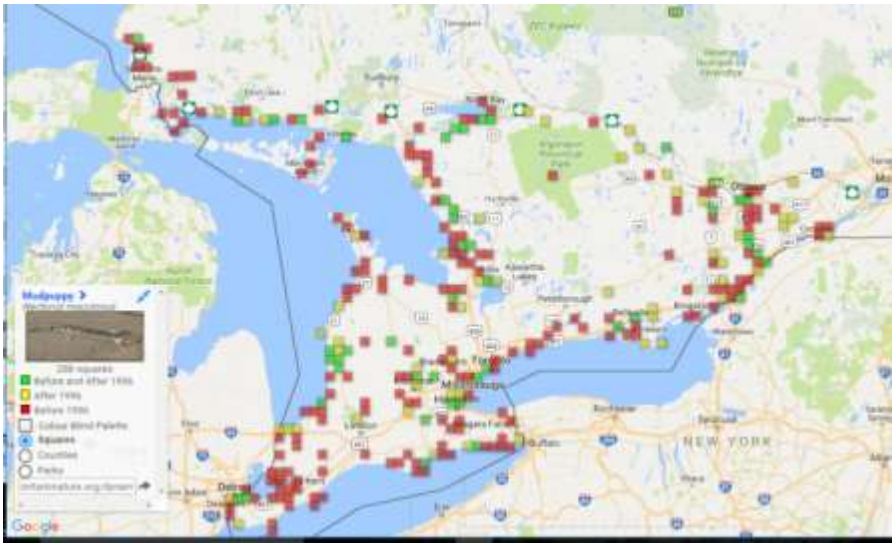
If you say "keystone predator", I think "Necturus" now.
Most creeks lack winter foragers, and so we must allow
Their presence here transforms the stream. Though we may not know how,
Around these long-lived Salamanders the creek's life revolves.

CHORUS:
Necturus maculosus – they prowl the winter nights.
The tadpole is their snack food, the Crayfish their delight.
When Oxford Mills, incurious, has tucked itself in tight,
They wander, cleaning up the creek, beneath the shelves of ice.

About 25 years ago, Schueler and Karstad learned that Mudpuppies were seen in winter in the open water of Kemptville Creek below the dam in Oxford Mills (at right). They started to visit the dam regularly and continue to the present, inviting the public to their 'Mudpuppy Nights' at Oxford Mills Friday nights November through ice breakup - the longest running herpetological winter programme in Canada. Up to 150 Mudpuppies have been seen on a winter's night. As Mudpuppies have no specially designated status, there has been no funding for this study.

Mudpuppies are neotenic, retaining their larval morphology at sexual maturity. They never come out on land. Their secretive habits and nocturnal activity pattern mean they are not observed casually in lakes and muddy waters. Kemptville Creek has a rocky limestone bed making it easier to find and observe them. In the Great Lakes they are caught in minnow traps and by ice fishing.

Mudpuppies are positively rheotropic, always moving upstream. When they reach a barrier such as the Oxford Mills dam, their progress is halted and their numbers build. They feed on small fish, tadpoles and crayfish in the current. Rhynichthys cataractae, a small fish characteristic of fast moving water, is only known from the Rideau system because Karstad and Schueler found one wedged sideways in the mouth of a Mudpuppy! Their ability to remain active in water to 0°C apparently stems from their ability to switch isozymes. Mudpuppies have more DNA than any other animal. Mudpuppies are a 'keystone predator' in Kemptville Creek and structure the ecology where they are abundant, keeping numbers of crayfish down.



They showed a map from the Ontario Nature website illustrating the distribution of Mudpuppies in Ontario (depicted at left). Other than a few records from Thunder Bay they have not be observed north of Batchawana Bay.

The presence of their distinctively shaped vertebrae in beach drift is an indication Mudpuppies are in an area (as at right here).

Mudpuppies are the host of the larval Mudpuppy Mussel, Simpsonaias ambigua. This freshwater clam lives under rocks were the Mudpuppy female breeds. Karstad and Schueler showed specimens from their first visit to the only Canadian population at the Sydenham River in SW Ontario.

Mudpuppies are threatened by poor water quality, PCBs and organochlorine pesticides. At a site on the St. Lawrence with high levels of PCBs, over 60% of captured Mudpuppies had limb deformities; none of the Oxford Mills Mudpuppies show any signs.

High water levels, flow above 2m/sec, too much ice, and high organic and hydrogen sulphide levels spilling over the dam keep Mudpuppies downstream of the viewing area in Kemptville Creek, making Mudpuppy Night in Oxford Mills a weather-dependent spectacle.

Karstad and Schueler feel they may be seeing a hint of decline in Mudpuppy numbers in Kemptville Creek the last few years, although determining trends will require careful regression on a wide range of variables. Figures from 1998-1999 to 2013-2014 monitoring seasons are shown in the table on the next page.

Winter	Counts	Mean	Zeros	# seen	STD	Last sighting
1998-1999*	11	12.18	2	0 - 30	11.87	19 March
1999-2000	16	8.56	2	0 - 30	10.25	16 March
2000-2001	29	15.69	5	0 - 75	18.36	31 March
2001-2002	21	9.95	5	0 - 46	12.16	29 March
2002-2003	27	22.04	1	0 - 50	16.24	21 March
2003-2004	28	9.21	12	0 - 60	16.50	3 March
2004-2005	27	14.67	7	0 - 80	24.26	25 March
2005-2006	21	4.52	11	0 - 30	8.21	10 March
2006-2007	33	29.48	13	0 - 128	41.21	23 March
2007-2008	29	14.17	5	0 - 49	14.12	28 March
2008-2009	27	40.37	5	0 - 170	55.59	6 March
2009-2010	32	43.09	6	0 - 160	51.25	5 March
2010-2011	29	38.59	6	0 - 125	42.45	4 March
2011-2012	28	24.96	0	1 - 103	25.47	9 March
2012-2013	33	24.09	8	0 - 98	29.53	22 March
2013-2014*	26	34.08	5	0 - 159	45.64	[data to 28 Feb]

Rusty Crayfish were first noted in 2012. By 2015, 91% of crayfish examined were hybrids of the Rusty and the native Orconectes virilis. In January 2016, Schueler questioned whether these hybrids would overpower the Mudpuppies. For some reason, there was an "astonishing and fatal" upstream movement of crayfish waords Raccoon predation in the spring on 2016 and in a survey of the downstream creek in September 2016, no Rusty or hybrid Crayfish were seen.

Members were invited to view and photograph a Mudpuppy and peruse Karstad's art and some of their publications and books.

At left, we have a top view of the female Mudpuppy showing the red external gills and conspicuous dorsal spots (photo: Glenn Coady).

Questions following the presentation:

Bertin: Where do Mudpuppies go in the summer?
Karstad & Schueler: We don't know. In 1987 we captured 24 Mudpuppies and marked them with a toe clip. Two weeks after release, we had a zero recaptures. The pattern of spots on the back of each Mudpuppy is unique; Karstad now photographs each captured Mudpuppy. They hope to share a pit reader used in a Yellow-spotted salamander project in the "off season".

Carley: Where would a person look to maximize their chance to see a Mudpuppy?
Karstad & Schueler: A shallow stream in a shale/limestone area. They may congregate below a dam, perhaps for the oxygen. Walk in water at least knee deep and lift the far side of large flat rocks. Mudpuppies like to swim in the middle of the current and may be in open water in the winter, but not in the summer. They like to feel snug and close and will "pack" in cracks (i.e. positively thigmotactic). They are more sluggish in the summer. They are also found in muddy water, but more difficult to see.

Bryant: How do you catch a Mudpuppy?
Karstad demonstrated by placing a hand on each side of the Mudpuppy, lifting it from the water, and then placing a hand in front of its face as they like to feel snug.

E. Addison: Can you use a net?
Karstad & Schueler: Only on rocky bottom if not too stony; otherwise they will disappear into the cracks.

Bruce Falls: Cottage at Go Home Lake has hard rock areas along the shore. Falls has observed only one Mudpuppy there in many years, and it was in the mouth of a watersnake.
Schueler: Watersnakes are a recognized predator. Pike have come to the base of the falls some winters. They remain until water temperature goes below 4C.

E. Addison: Are they exclusively carnivorous?
Karstad & Schueler: Yes. They may incidentally ingest some vegetation.

Eadie: What is average life span?
Karstad & Schueler: No one has Mudpuppies of known age. Age can be determined from rings of humerus. They may live up to 35 years.

Bertin: What is maximum size?
The largest Schueler and Karstad have measured at Oxford Mills is 32.5 cm. They grow larger in Lake Erie (up to 50 cm. RA).
They mate November/ early December – this is as yet unobserved. The male leaves a sperm package which the female picks up and stores. Eggs are laid in May on the underside of rocks. Newly hatched young are striped, not spotted. They disperse to gravel bars and are seldom seen till they are 8 cm in length when spots begin to develop.

Daniels: In the 1980s Daniels along with Bryant and Curry found two Mudpuppies in the Ganaraska River. Daniels released one in a small pond in his yard where it survived for eight years. A small bubbler kept a bit of open water through the winter.
Karstad: A bubbler would be necessary to keep ice open because although Mudpuppies do breathe through the skin, they also gulp air at the surface.

T. Rising: You mentioned they are not active about 14C in the summer. Do they aestivate?
Karstad & Schueler: In the Montreal study, none were caught in the minnow traps above that temperature.

R. Addison: Can you tell the sexes apart?
Karstad & Schueler: Yes. Generally, the females are larger. As well, the male has papillae along the vent while the female does not.

The speakers were thanked by Kristen Martyn, who has participated in two Mudpuppy Nights at Oxford Mills.

OBSERVATIONS AND LITERATURE REVIEWS

E. Addison: Aleta's father, Lars Karstad, spoke to the Brodie Club at meeting 688 in 1971 on 'Wildlife Diseases of Ontario'. Aleta spoke at meeting 721 in 1975 on Biological Illustrating.

Daniels: At midnight yesterday an Eastern Screech-Owl was calling from a driftwood perch above his backyard pond at Yonge and 401.

E. Addison: In the Ignace/Sioux Lookout area the grouse population is extremely high; about 60% Spruce Grouse/ 40% Ruffed Grouse/ 0% Sharp-tailed Grouse.

Bryant: Has noted a sharp drop in numbers of Ruffed Grouse in S. Ontario and questioned whether this might be related to increase in Wild Turkey numbers.

Currie: observed a Le Conte's Sparrow at Marie Curtis Park in Mississauga early in the day. It was seen by Brodie members Martyn and Curry (in the photo below, credits: Kristen Martyn).

Coady: On October 15 at the memorial service for Alan Wormington a Cloudless Sulphur was observed. This is a large yellow butterfly – in Glenn's words – "like nothing else".

Schueler: At a stop at the rail yard in Havelock on the drive over today, he collected some Xerolenta obvia, a European land snail with a beautiful flat white shell. Its first occurrence near Bethany was described by Grimm and Wiggins in 1974. It is gradually spreading. It is non-invasive and very xeric. It's depicted at right in a 5X7 oil by Karstad, 2010.

Members enjoyed coffee, looking at the live Mudpuppy, and viewing some of Karstad's original art and some of Karstad's and Schueler's publications.

Links provided by Karstad and Schueler:
http://pinicola.ca/
Bishops Mills Natural History Centre - http://pinicola.ca/bmnhc.htm
Mudpuppy Night in Oxford Mills - http://pinicola.ca/mudpup1.htm
Fragile Inheritance - http://fragileinheritance.org/

Blogs:
Daily Paintings - http://karstaddailypaintings.blogspot.com/
Vulnerable Watersheds - http://vulnerablewaters.blogspot.ca/
Doing Natural History - http://doingnaturalhistory.blogspot.ca/
Adapting - http://adaptating.blogspot.ca/
Quiet Curatorial Time - http://quietcuratorialtime.blogspot.ca/ (not very active)

Facebook (Schueler) - https://www.facebook.com/bckcdb
(Karstad) - https://www.facebook.com/aleta.karstad
Mudpuppy Night in Oxford Mills - https://www.facebook.com/MudpuppyNight

NEXT MEETING

The next meeting will be on 15 November 2016. The speaker will be Erica Nol, who will present: "Songbirds in the settled landscapes of Ontario: how will they survive?"

The meeting was adjourned at 9:10 pm.

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