THE BRODIE CLUB

Established 1921

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

THE 1,113th MEETING OF THE BRODIE CLUB

The 1,113th meeting of the Brodie Club was held on Tuesday, 16 October, 2018 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: George Bryant
Secretary: Kevin Seymour

The meeting was called to order at 7:35 pm and was attended by 42: 30 members and 12 guests.

Roll Call:

Present: E. Addison, R. Addison, Aird, Beadle, Bryant, Carley, Coady, Currie, Curry, DeMarco, Dengler, Dunlop, A. Falls, B. Falls, Hussell, Iron, H. Juhola, King, Kortright, Lumsden, Machin, Moldowan, Peter, Pittaway, Reading, Rising, Seymour, Slessor, Strickland, Tomlinson.

Guests: Domenic Stone (guest of Bryant), Kathy Ziebart (Moldowan), Janet Kelly (Dunlop), Amanda Guercio (Peter), James Eckenwalder and Ron Dengler (Dengler), Rachel Gottesman (Kortright), John Bacher and Mary Lou Jorgensen (H. Juhola), Lynda Pym (Aird), Katherine Falls (A. and B. Falls), Rae Hutchinson (Tomlinson)

Regrets: Abraham, Bell, Bertin, Crins, Daniels, Dunn, Eadie, LaForest, Martyn, McAndrews, Obbard, Thomas

Minutes: Minutes of the previous meeting approved by a show of hands, pending correction in the archival version of the incorrect spelling of names for guests (Sharon Hick and Rachel Gottesman).

Committee Reports:

Program Committee: E. Addison reported that the November talk will be on Monarch Butterflies and the December talk will be on long-term bird monitoring by member Tomlinson. January talk will be by Nick Eyles on glaciers, and the February will feature Mike Oldham on unusual plants in Ontario.

Announcements:

Paul Aird announced that although he is 88 and still pursuing many things of interest (note his article on Kirtland's Warbler in the latest issue of Ontario Birds), he has decreasing cognitive function and memory issues. His wife Linda Pym was present to support him.

Carley gave an unpaid political announcement urging people to be aware that if they live in Toronto Ward 14, Paula Fletcher has not answered in the positive to confirm she supports the Master Plan for the Spit, whereas all the other counsellors in this ward have publicly supported it.

Dengler continued in this vein to say that the Protect Nature website (www.protectnatureto.org) maps all the significant natural areas in each Toronto ward.

ANNUAL GENERAL MEETING:

Treasurer's Report (appended at bottom of minutes). The membership year is Oct 1 to Sept 30. Although there was a slight deficit last year, the membership is increasing. Dues are now $20 and can be paid to the new Treasurer, Bob Kortright. A motion to accept the Treasurer's Report was made by Peter and seconded by De Marco. The motion passed unanimously.

The following motion was made by E. Addison and seconded by Currie: "Be it resolved that the Brodie Club authorizes Robert Kortright to sign cheques on behalf of the Club as sole signatory." The motion passed unanimously.

The slate of officers was presented by Rose Addison on behalf of Katie Thomas (unable to attend). A motion to accept the slate below was made by Hussell and seconded by Rising. Motion passed unanimously. *[Editor's note: Slate as voted on made some reference to chairpersons, but these have been removed to conform with Brodie Club tradition of working collegially in committees without formal structure.]*

Additional volunteers for Recording Secretary would be welcomed. The job entails taking notes at 1-2 meetings a year and writing it up for the minutes (which the Editing Secretary formats and distributes)

Committees 2018-19

Editing Secretary: Ricky Dunn
Corresponding Secretary: Katie Thomas
Recording Secretaries: Ken Abraham, Ed Addison, George Bryant, Kristen Martyn, Kevin Seymour
Treasurer: Bob Kortright
Membership: Trudy Rising, Bill Crins, George Bryant, Bob Curry
Program: Ed Addison, Bruce Falls, Marc Johnson, Don Sutherland, George Bryant
FON Representative: Carolyn King
Archives: Ricky Dunn, Sandra Eadie, Kevin Seymour
Refreshments: Trudy Rising, Jerry DeMarco, Anne Bell, Nancy Dengler, Sharon Hick, Oliver Bertin, Nancy Dengler
Website: Ricky Dunn, Jeremy Hussell
Field trip: Justin Peter, Katie Thomas, George Bryant
AV: Jeremy Hussell

SPEAKER:

E. Addison introduced the speaker, Dan Strickland. Dan was Park Naturalist at Algonquin Provincial Park for many years. He has worked on Canada Jays in Quebec, Anticosti Island and Algonquin. His mentor was Russ Rutter (1899-1976) who started the colour banding project of these birds, and launched the Algonquin study, which Dan has continued. This study has been going on now for over 50 years. Dan received the Amethyst Award from the Ontario Public Service.

Canada Jays East and West

Recently Dan had the opportunity to study the Canada Jays on Vancouver Island, and was struck by the many differences between this "Pacific" form (*Perisoreus canadensis obscurus/griseus*) and the eastern/boreal form (*Perisoreus canadensis canadensis*). He reviewed the biology and ecology of Canada Jays in the east, then spoke about the western form.

Canada Jays in Algonquin Park

These birds readily come to a suet bait station, and once accustomed to taking bait they are trapped in Potter traps, banded and released on the spot. They are long-lived, often living over 10 years (sometimes as many as 16) and they live and nest in a permanent territory. Most of their low annual mortality occurs in the summer, suggesting that migratory predators such as Sharp-shinned hawks are a problem but that winter food is not. Yet in winter the forest is notoriously empty of food. These jays do not avail themselves of seed crops from the coniferous trees as the red squirrels do, and although they will scavenge from a mammalian carcass, those aren't common enough to be a regular source of food. So what do they eat? They cache food in crevices of trees during spring, summer and fall, after coating it in sticky saliva, and then recover it in winter for themselves and, at least to some extent, for their nestlings. They have been reported to make as many as 1000 caches per 17-hour day in June in Alaska and there is suggestive evidence that they may recover this food from memory.

The large bulky nests are built in late winter and are lined with feathers. When the female sits on the nest she fits in so well that she seals the warmth into the nest. She feeds herself by leaving the nest for short periods. The male also feeds her but visits very infrequently, minimizing visits to the active nest—behaviour which may serve to reduce detection of the nest by red squirrels. After eggs hatch both parents will feed young, bringing large amounts of food each time--again minimizing nest visits. The usual number of eggs is three, but two to five are possible. The young fledge after about 23 days and remain close together, being fed by the parents for up to six weeks. At this point the nest mates fight and only the dominant juvenile (usually a male) stays in the territory, while the others are ejected. About 80% of those ejected do not survive past their first fall, but some are accepted into territories of unrelated parents. When trios of birds are seen on a territory, two-thirds of these trios consist of parents with their dominant juvenile, whereas one third consist of a pair with an unrelated juvenile. In the next nesting season this juvenile may contribute to the feeding of next year's brood, but only once the young have fledged--never being allowed to feed the young in the nest.

Young are banded prior to fledging. Nests are reached by ladder or with the help of a professional tree climber. The young are banded, weighed, measured and blood-sampled before they are returned to the nest. After they fledge, their survival, dispersal and eventual nesting success can be followed for years, thanks to their unique combinations of coloured bands.

There has been a marked decline in number of occupied territories in Algonquin Park. Taking the number of territories in the 1970's as a baseline, by the 1990's only half the territories were occupied and by 2012 only one-third of these territories were occupied.

There are four big questions about this population.

1. Why do they nest so early, in the late winter? Most birds nest in the spring when food for nestlings is readily available. And why do they not nest a second time, like many passerines do? The answer seems to have four parts. First, the earlier nests are safer from nest

predators. Second, the early fledglings have more time to develop food storage skills. Third, the earlier the young are produced the more competitive they are, and fourth, producing early fledglings gives the adults more time to store food. But the key thing allowing them to reap the benefits of early nesting is that stored food allows them to get away with nesting at an otherwise foodless time of year. The jays eat almost anything, such as berries, fungi, arthropods, small mammals and carrion—but it is all perishable and does not include tree seeds.

2. Why prevent the juveniles from helping at the nest? Apparently to avoid betraying the nest location to red squirrels. Only once the young have fledged and can fly are the juveniles allowed to assist in feeding the young.
3. Why eject siblings from the natal territory? From the remaining juvenile's point of view, this is probably to prevent its siblings from stealing the food that the parents have stored for the next winter. This may allow the dominant juvenile to have exclusive access to a parental subsidy of stored food that is necessary to get the juvenile through its first winter.
4. Why is the population declining? All the territories in hardwood forests have been lost, and those in coniferous forest are down to 25% of their former number—except for Black Spruce areas, which are only down to 75% of their former number. A food storage experiment (using raisins, blueberries and mealworms) demonstrated that food stored in Black Spruce survives very well, probably due to the volatile chemicals given off by the trees, which slows down the action of bacteria and fungi. Food stored in Sugar Maple does not store well. But with the warming climate, even the benefits of storing perishable food in spruce trees are apparently being compromised by increased degradation by bacteria and fungi. We do not know for sure, though, whether jay territories in hardwoods are the first to become unsustainable due to climate change or whether they are merely the least attractive to a population decreasing for other reasons.

Races of Canada Jays

Although historically 13 races were described, only three appear to have any validity.

1. The nominate race, *Perisoreus c. canadensis* which extends from Newfoundland to Alaska.
2. The "Rocky Mountain Jay" (*P. c. capitalis/bicolor*), which ranges from SE BC, through the Rocky Mountains in ID, MT, WY, UT, CO, AZ and NM. It has an almost white head, with the eye in particular being surrounded by white.
3. The "Pacific" form, which was originally considered to be a separate species (*P. obscurus*). It has a very pale breast, more extensive dark on the head, white shaft streaks on the back and is genetically distinct. It was deemed to consist of two races, the nominate race, *P. o. obscurus*; the "Oregon Jay" inhabiting the coastal ranges in WA south to northern CA and described in 1876: and *P. o. griseus*, the "Gray Jay", described by Robert Ridgway in 1899, and allegedly inhabiting Vancouver Island and the mainland coastal range of BC extending south in the Cascades to northern CA.

The "species" *P. obscurus* was lumped into *P. canadensis* in 1944 so at that time its two subspecies, the "Oregon Jay" and the "Gray Jay" became subspecies of *P. canadensis*. Later, of course (in 1957) English names for subspecies were abandoned and the name "Gray Jay" was elevated to become the English name for the entire species (*P. canadensis*). Until this year, of course, when we got the original name, "Canada Jay", re-instated.

Nominate race on left; Pacific form on right

Lineage 3 above (the "Pacific" form) probably split from the other "canadensis" lineage about 270,000 years ago. The "canadensis" lineage later split into more detectably different lineages, including what is now considered to be the nominate (boreal and eastern) race and also the "Rocky Mountain" form. All these forms probably came into existence during times of glaciation, when refugial populations were geographically separated.

"Pacific" Jays

Dan had the opportunity to start a research program on Vancouver Island Canada Jays in 2016. Besides the plumage differences from the nominate race noted above, these birds average about 5g lighter in weight, and have a most remarkable property: their feathers change colour during the year! This is not due to wear or moult. In June when they moult, the incoming feathers on the wings and tail are grey, but by the time they are moulted in the following year those grey feathers have turned brown. Although museum specimens of all three races eventually turn brownish (after 20 years or so) the "Pacific" race has initially grey feathers that turn brown within a year (i.e., while the feathers are still on the living bird, and before the next annual moult). This remarkable property probably led to the misidentification of individuals in fresh (greyer) plumage as a new subspecies (namely the "Gray Jay", *P. o. griseus*) whereas, in reality they were merely fresher individuals of the earlier named "Oregon Jay", *P. o. obscurus*. Certainly the type specimens of both subspecies examined in April 2016 at the Smithsonian Institution are now equally brown and indistinguishable from each other.

Molting "Pacific" Jay with mix of fresh gray and old brown plumage

Behaviourally, the "Pacific Jays" of Vancouver Island often associate in large social groups of 5 to 7, and these groups can temporarily merge into larger groups of 13 or more birds -- very different from the Algonquin birds that never travel in groups larger than 3 once the young have fledged and some have been ejected.

The study area is in the subalpine zone of Strathcona Provincial Park, where the dominant trees are mountain hemlock, amabilis fir and yellow cedar -- and no spruce. It is very snowy, with 2-4 metres of snow pack (or more) accumulating in the winter, but overall temperatures are much milder such that the creeks never freeze. Nests are often extremely high in the trees, so it was impossible to see what was going on in those nests (let alone get up to the nests to band the nestlings). Most banded birds in the study have been caught as juveniles or adults.

There are four big questions about the Pacific form

1. What is going on with the much bigger group size? These large groups still seem to be territorial family groups, but there can be up to three nesting pairs in a single communally held territory. Apparently, no juveniles are displaced, and no feeding of fledglings by nonbreeders has been observed to date—all very different from the Algonquin birds.
2. Why are Pacific Jays confined to subalpine areas? One possibility is that they need the abundant hanging lichen *Alectoria sarmentosa* (apparently with significant antibacterial properties) for its food storage strategy to be successful (as with spruce in the boreal forest).
3. What is the advantage of these large groups, if they are not used to assist the nestlings or fledglings? Perhaps they are used as an anti-predation awareness system. With more individuals, they can better spot predators, which primarily are *Accipiter* spp.
4. Does the Pacific form of Canada Jay (*P. c. obscurus/griseus*) deserve to be re-elevated to the status it once had of being considered a full species (*P. obscurus*) separate from *P. canadensis*? Dan makes the case that they are if one accepts the phylogenetic species concept. The two forms have different appearance, different social behaviour and different genetics. There are museum specimens from zones of overlap which look intermediate, so there appears to be some interbreeding between these groups, and this needs further study.

Questions following the presentation:

J. Peter asked if there was a difference in helping behaviour in Algonquin between the trios with a genetically related juvenile and those trios with a genetically unrelated juvenile. ANSWER: Can't say for sure. The few cases that have been observed all involved yearlings that were the previous year's offspring of the pairs they were still with (and therefore older siblings of the helped fledglings)

B. Falls asked how related those large groups of "Pacific Jays" are. ANSWER: The very large groups represent family groups coalescing in food-rich areas (usually related to humans!). Juveniles do sometimes show up in other territories, probably prospecting for higher status in the new group

Curry asked if there was a biochemical explanation for the colour change of the Oregon Jay feathers. ANSWER: This is not known yet. Dan initially thought it might be related to high-altitude exposure to UV light, but Pacific jays that live in Sitka Spruce forests on the coast of northern California are equally brown so this idea is not supported. Apparently, there is no other known case of this kind of colour change in bird feathers.

Jean Iron thanked the speaker, noting in particular his magnificent photos. She also thanked him for his role in getting the name Canada Jay restored for this species. She added that if this species gets split into three, we will all need to go to BC to see them, as BC is the only jurisdiction that contains all three!

<u>OBSERVATIONS</u>

Bryant noted the surprising lack of passerines in Britain recently, evidently due to declining populations.

Coady noted that in the Baillie journals stored at the Thomas Fisher Library, there is a note describing Murray Speirs taking photos through his scope 80 years ago, long before the modern rage of "digiscoping."

John Bacher noted that Baillie also wrote and praised Charles Fothergill, an underappreciated early naturalist, who among other things noted very early the decline of the Atlantic Salmon.

The meeting was adjourned at 9:30 pm.

Appendix 1. Financial statement

	2016-2017 Partial Actuals	2017-2018 Actuals	2017-2018 Budget	2018-2019 Proposed Budget
Balance Beginning	$1,201.19	$1,634.21	$1,634.21	$1,516.84
Revenue				
Membership		$1,110.00	$950.00	$950.00
Contributions		$42.00		
1100 Meeting	$6,400.00	$0.00		
Total Revenues	$6,400.00	$1,152.00	$950.00	$950.00
Expenses				
Meeting Expenses			$100.00	$0.00
Honoraria/Speaker Expenses		$373.26	$500.00	$500.00
1100 Meeting	$5,966.98	$0.00	$0.00	
FON scholarship		$350.00	$350.00	$350.00
Social		$215.10	$100.00	$250.00
Bank Charges		$120.13	$30.00	$30.00
FON Membership		$83.00	$83.00	$83.00
Newsletter		$127.88		$150.00
Total Expenses	$5,966.98	$1,269.37	$1,163.00	$1,363.00
Balance ending	$1,634.21	$1,516.84	$1,421.21	$1,103.84
Increase/Decrease	$433.02	-$117.37	-$213.00	-$413.00

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