

THE BRODIE CLUB



Established 1921

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

THE 1,129th MEETING OF THE BRODIE CLUB

The 1,129th meeting of the Brodie Club was held on Tuesday, 15 November 2022 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: Katie Thomas

Secretary: Trudy Rising

The meeting was called to order at 7:37 pm and was attended by 17 who braved the November snows: 13 members and 4 guests

Roll Call:

Present: E. Addison, R. Addison, Bacher, Bertin, N. Dengler, R. Dengler, Dunn, Hussell, Kortright, Miller, Rising, Thomas, Xamin.

Guests: Elsa Nicholson (guest of the club), Rachel Gottesman (Kortright), Peggy Haist (Bertin), Paul Xamin (Xamin),

Regrets: Abraham, Beadle, Bell, Bryant, Curry, DeMarco, Dunlop, Eadie, Eckenwalder, Harris, Juhola, Larsen, Martyn, Moldowan, Obbard, Peter, Slessor, Sutherland.

Minutes: Minutes of the October 2022 were approved with the following reported corrections:

- Attendees included Trudy Rising
- It was Ken Reading, not Ken Abraham, who had visited Ron Tasker
- John Riley noted that it actually took longer than 3 years to get one of his transplanted flowering dogwoods to produce blossoms and seeds. One finally did so in 2021, perhaps indicating that some kind of climate threshold may have been crossed.

Communications and Announcements:

- The **next meeting** will be on **13 December**, with Colin Jones speaking on “Ontario Insects: inventory, monitoring and discovery in the digital age.” Members are invited to bring edible goodies to share, and Oliver will be bringing a cake in honour of Bruce Falls’ 99th birthday!
- Helen Juhola would be happy to have calls or visitors to talk about natural history. She is at Providences of Care residence (416-285-3666).
- There was brief discussion of what to do if covid resurgence forces the U of T to again bar us from the meeting room. If that happens it was agreed that Zoom meetings should be held, and

perhaps one should be scheduled this winter to serve as a test. If so, a social half-hour at the start would give people a chance for informal visiting. Those experienced with combining in-person and online for a single meeting advised that this approach would be unrealistically expensive and complex for us.

- John Bacher noted that there is currently a proposal to redevelop the golf courses owned by the City of Toronto (<https://www.toronto.ca/legdocs/mmis/2022/ie/bgrd/backgroundfile-174602.pdf>), raising the question whether we should we take an activist approach. Ed Addison reminded us that the Brodie culture has been to not engage in political issues such as this as we have more strength commenting via groups already involved or by sending our comments independently. Rising, Dunn and Dengler added concurring comments. Links to resources that provide information on issues can be sent to Katie (kmthomas.email@gmail.com) for distribution if deemed to be of widespread interest to Brodie members.

Annual General Meeting

The committees as they stand now, after agreements to continue and requests to stand down, are as shown below. If you wish to volunteer or to step down, please contact Katie Thomas.

:

- Recording Secretaries (Take notes and write draft of presentation): Ken Abraham, Kevin Seymour (Dunn as a sub)
- Editing Secretary (Produce newsletter): Ricky Dunn
- Corresponding Secretary (Deals with email & announcements): Katie Thomas
- Treasurer: Bob Kortright
- Membership: Bill Crins, Bob Curry
- Program (arrange speakers): Trudy Rising, Marc Johnson, Don Sutherland
- Ontario Nature Representative: Carolyn King
- Archives: Ricky Dunn, Kevin Seymour
- Refreshments: Jerry DeMarco, Anne Bell, Nancy Dengler, Sharon Hick, Oliver Bertin.
- Website: Ricky Dunn, Jeremy Hussell
- Field trip: Justin Peter, Katie Thomas
- AV: Jeremy Hussell, Dominic Stones
- By-Laws revision: Ricky Dunn, Katie Thomas, John Riley

The Treasurer's report had been emailed to all. Discussion about paying speaker honoraria was deferred until we can poll a larger proportion of the membership. Dues for this year continues at \$20, or \$10 for those who can almost never attend but want to stay in touch. Dues can be paid cash or cheque, made out to 'The Brodie Club,' given to Bob Kortright at a meeting or mailed to him at 37 Ashland Ave., Toronto M4L1J9, or by Interac email transfer to bobwsk@sympatico.ca.

Rising thanked those who have recommended speakers, and requested additional suggestions so we can fill remaining slots and start scheduling for the following year. Send suggestions to trudyrising@gmail.com with the full name and title of the potential speaker, the area of expertise and/or a specific topic, whether the candidate is known to be a good presenter, and the candidate's contact information (email, phone and mailing address if available). If you are offering to give a presentation yourself, send the same information, adding a presentation title if you have one and noting any constraints you may have on date of presentation.

SPEAKER:



Trudy Rising introduced the speaker. Brodie member Ricky Dunn had an eclectic career, working variously at Trent University, Environment Canada and the Cornell Laboratory of Ornithology. Much of her work was with citizen science programs, evaluating and analyzing data from Project FeederWatch (which she founded), Breeding Bird Survey, Christmas Bird Counts and the Canadian Migration Monitoring Network. In retirement she has continued working with data from these programs.

Avian Irruption: Causes and Consequences

Avian migration patterns vary across a broad continuum. ‘Obligate’ migrants move regularly between fixed breeding and wintering areas, and all individuals participate. ‘Facultative’ migrants display variation in timing, frequency, direction and distance of travel, as well as in the proportion of the population that participates. The latter group includes several sub-types:

Nomads, such as Red-Crossbill and many dry-country birds that follow rainfall. These birds normally stay within a definable year-round range, but when and where they breed depends on resource availability each year.

Irruption migrants, defined as species that periodically disperse beyond the boundaries of their normal wintering range. Classic examples are boreal-nesting finches and raptors, which depend on food resources that themselves feature cycles of boom and bust. In years of low food within their normal range they disperse widely in search of better resources.

Partial migrants are those whose movements are fairly predictable in timing and direction, but the proportion of population participating can vary with age or sex, or conditions specific to a particular subpopulation. For example, in some normally resident species, individuals nesting in Canada may move south for the winter.

The categories of facultative migration overlap and a species’ pattern may shift over time if the causes and/or consequences of movement undergo change. Red- and White-breasted Nuthatches, the main focus of the talk, are closely related species whose movements do not neatly fit into any one category. Most references classify the Red-breasted as irruptive and the White-breasted as resident (although acknowledging occasional local movements). Close examination, though, shows that their movements share some features with other types, including regular obligate migrants.

One of the challenges to studying irregular migration is just that – the movements are irregular. It is therefore difficult to follow a population of birds throughout the annual cycle. In the past, records of spectacular avian irruptions were recorded in newspapers, while more subtle movements mostly went unremarked. The development of broad-scale citizen science programs has made a tremendous difference. A landmark 1976 study based on analysis of Christmas Bird Counts (CBC), which involved tedious pre-computer extraction of records from printed annual reports, found that movements of 7 boreal-breeding species, including the Red-breasted Nuthatch, moved into the southeastern U.S. approximately biannually. Their irruptions were synchronous, and occurred in years that CBC compilers had reported as having low levels of natural foods. Citizen science programs now offer over 60 years of high-quality CBC data, 35 years of data from Project FeederWatch, and almost 20 years of eBird, all of which Ricky used in her studies of nuthatches.



A particularly large irruption of Red-breasted Nuthatches through Long Point in the fall of 2012 inspired a close look at bird observatory records. A key early realization was that both nuthatch species move through LPBO during normal migration seasons, unlike the movements of many irruptive finches. At least a few nuthatches are counted and captured every year, so condition, age and sex could be compared for years with and without irruptions. The 60 years of data from LPBO found, as did the CBC analysis of 1976, that numbers of Red-breasted Nuthatch at LPBO fluctuate approximately biannually. Birds captured in years of irruption and in years with no movement did not differ in age or sex ratios, or in body condition.

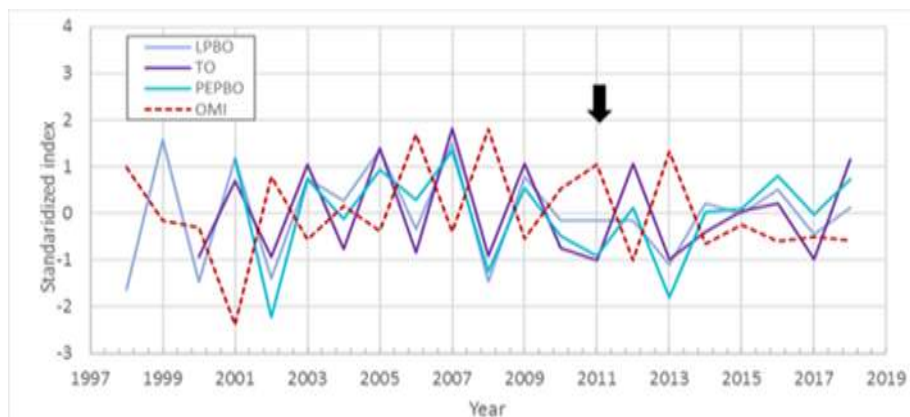
Fluctuations of Red-breasted Nuthatch at LPBO were closely mirrored by changes at 6 other bird observatories in southwestern Ontario, triggering the next step of looking to see whether irruptions through southern Ontario were picked up by broad-scale citizen science programs covering the U.S. Fall increases in Red-breasted Nuthatches at LPBO proved to match up with widespread increases across the entire eastern U.S., detectable by CBC, Project FeederWatch and eBird. Movements are very extensive, detectable throughout the northeastern U.S. and occasionally even as far south as the U.S. Gulf Coast. Data from eBird revealed speed of movement, showing that in 2012, it took almost a month after peak numbers appeared at Long Point for numbers to reach a peak in the southeastern U.S.

The cause of irruption in the Red-breasted Nuthatch has been shown in several studies to involve widespread reduction in cone production by conifers within the species' mainly boreal breeding range. Many conifers show patterns of occasional bumper crops, often followed by a very poor crop, and the frequency of high productivity years varies among species, often 3-5 years but even longer in some species. These patterns are thought to be an evolutionary strategy that occasionally knocks back populations of seed predators. However, researchers have shown that conifer seed crops are only one factor contributing to irruption of the Red-breasted Nuthatch, and that population density must also be relatively high for the birds to move. Ricky followed up on this by looking at Breeding Bird Survey data for eastern Canada to check for a relationship between breeding density and irruption at LPBO. As expected, irruptions were less likely to occur when breeding density was low, and more likely when numbers were high. Moreover, in the summer *after* a big irruption, breeding density to the north of LPBO declined – falling by up to 50% from numbers in the same area the previous year. It has long been assumed, with some evidence, that mortality in irrupting populations is likely to be higher than normal, but the Red-breasted Nuthatch finding was the first direct documentation of a population-level effect.

Ricky had not thought to look at White-breasted Nuthatch, as it did not stand out as fluctuating in abundance at LPBO. But when diurnal migration watchers at Cape May, New Jersey and elsewhere

began using social media to talk about noticeable flights in some years, Ricky was roped in. LPBO data showed that this species, too, fluctuates biannually. Further work showed that movements in this species were very similar to those found for the Red-breasted Nuthatch. Movements are unrelated to age, sex or body condition, they were synchronized across other counts sites in Ontario, and they were detected by broad-scale citizen science data sets in the northeastern U.S. The main differences were that White-breasted movements did not extend as far as the southeastern tier of U.S. states, and population density neither influenced movement nor was affected by it.

Lack of conifer cone production could not have triggered White-breasted Nuthatch movements because its habitat and foods are largely non-coniferous. However, plant productivity in other vegetation was available. Staff of the Ontario Ministry of Natural Resources record annual levels of fruit and seed production (“mast”) in 25 shrub and tree species across the province. Indices of mast levels within the White-breasted Nuthatch breeding range are strongly synchronous across species and fluctuate biannually, as shown in the figure below. The figure also shows that indices of nuthatch abundance during the fall migration period go up when the mast index is low. The arrow points out an anomalous year when plant production remained high for a second year in a row – and the birds also did not move. Though one point does not prove the case, this suggests a direct response on the part of the nuthatches to the condition of the plants. Red-breasted Nuthatch numbers at LPBO are also negatively related to the Ontario mast index, but not as closely, presumably because of the additional effect of population density on that species’ irruptions. However, both nuthatches switched from odd-year irruption to even-year irruption after the 2011 anomaly in the mast index.



White-breasted Nuthatch fluctuations at migration count sites in southern Ontario (solid lines) and annual levels of the Ontario Mast Index (dashed line). See text for explanation of arrow.

The Red-breasted Nuthatch differs slightly from classic irruptive species in that it is relatively predictable in frequency, timing, direction and distance of movement. White-breasted Nuthatch has very similar movement patterns, but is not considered irruptive because individuals on the move do not stray beyond the breeding range of the species as a whole. Though often classified as Resident, it should really be classified as a Partial Migrant, due to the migratory tendency of individuals at the northern end of their range. The unusual thing about the White-breasted Nuthatch is that those movements are so much like the irruptive movements of the Red-breasted. Perhaps this is not really all that unusual, though. It would be interesting to use the same data sources to take a closer look at some other species widespread in the U.S. and known to make partial movements out of Canada from time to time, to see whether they might be as regular as the White-breasted Nuthatch, perhaps even in synchrony. Possible candidates would be Blue Jay, Black-capped Chickadee and Northern Cardinal.

Questions:

What causes the regular fluctuation in the Ontario Mast Index?

- Some have suggested that plants 'take a year off' after putting a lot of effort into reproduction. Also, plant-feeding insects are short-lived, unlike the mammalian and seed predators that feed on conifer seeds, so perhaps a 2-year cycle is all the plant 'needs' to reduce deleterious insect damage. Climate conditions also have an effect, and the very widespread synchrony of mast production in 25 diverse plant species in Ontario suggests that they respond to common factors. It would be interesting to learn how much beyond Ontario the synchrony of mast production extends.

You showed that in irruption years, Red-breasted Nuthatch numbers within Ontario increased in CBC and at bird feeders. Do these birds come from farther north, or do they represent a minor shift of habitat to places where non-coniferous foods are easy to find?

- It could be either or both. We know very little about movement of individual birds. Tracking technology is needed to tell us how far individuals move and whether that varies with breeding latitude, and whether decline at feeders throughout the winter represents mortality vs. moving on to other habitats.

OBSERVATIONS

Trudy Rising went to see migrating Whooping Cranes in Saskatchewan in early October with Quest. The small group saw thousands of migrating Snow Geese, Ross's Geese, about 20+ Whooping Cranes, and many Sandhill Cranes. The immense prairies were spectacular at this time of year: golden, lush, and filled with interesting birds in migration, as well as partridges and grouse. Few sparrow species, however.

The meeting was ended 9:10.