

# THE BRODIE CLUB



*Established 1921*

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

## **THE 1,089th MEETING OF THE BRODIE CLUB**

The 1,089th meeting of the Brodie Club was held on Tuesday, 19 January, 2016 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: George Bryant

Secretary: Kristen Martyn

The meeting was called to order at 7:30 pm and was attended by 38: 29 members and 9 guests.

### **Roll Call:**

Present: E. Addison, R. Addison, Beadle, Bertin, Bryant, Carley, Crins, Currie, Curry, Daniels, A. Falls, B. Falls, Hussell, Iron, A. Juhola, H. Juhola, Larsen, Machin, Martyn, Obbard, Peck, Pittaway, Reading, Riley, J. Rising, T. Rising, Speakman, Sutherland, Tomlinson.

Guests: Kathy Lindsay (guest of Riley), Dierdre Tomlinson (Tomlinson), Katie Thomas (Beadle), Heather Speakman (Bertin), Justin Peter (B. Falls), Carolyn King (A. Falls) and 3 guests of Carley: Victoria Carley, Nancy and Ron Dengler.

Regrets: Abraham, Eadie, McAndrews, Rapley, Slessor, Zoladeski

**Minutes:** Minutes accepted as distributed.

### **Committee Reports:**

Membership: Justin Peter has now attended 3 meetings and has submitted a biography for consideration of membership (appended to end of minutes)

FON: The Brodie Club received a thank-you letter from the Youth Summit for Biodiversity attendees, including an individual note from Nicole Sosnov, the student sponsored by the Brodie Club, in which she stated the Youth Summit for Biodiversity was the “best weekend of her life.”

The fee to sponsor a student for the 2016 Youth Summit for Biodiversity has increased from \$300 to \$350. When polled the majority of the Brodie Club were in favour of sponsoring another student in 2016. An envelope was passed around to collect funds, and \$280 was raised, leaving a shortfall of \$70. Treasurer Juhola said the Club could not afford this year to top up the amount.

**We therefore hope that those who missed the January meeting or were unable to contribute at that time can, at the February meeting, bridge the gap to the \$350 for a full sponsorship.**

It was asked whether the Brodie Club could nominate a specific person to be sponsored with our money. It was decided that members could put names forth at the next meeting.

Program: Presenter for the next meeting (February 16<sup>th</sup>) will be Peter Kotanen and the topic will be “Invading Plants Escape.” Marty Obbard will be speaking about the “Tipping Point for Polar Bears” at the March meeting. The speaker for April will discuss Sturgeon and potentially the topic for May will be Mudpuppies.

May meeting dates are often juggled to avoid key birding weekends. At the February meeting, Brodie Club members will vote to meet either on May 10<sup>th</sup> or 17<sup>th</sup>. **If you have a preference and won't be present, send your vote to Rose Addison.**

**SPEAKER:**

The speaker for the evening was Dr. Bridget Stutchbury, author of books “Silence of the Songbird” and “Bird Detective” and Professor of the Department of Biology, Faculty of Science and Engineering at York University. Her presentation for the evening was entitled:

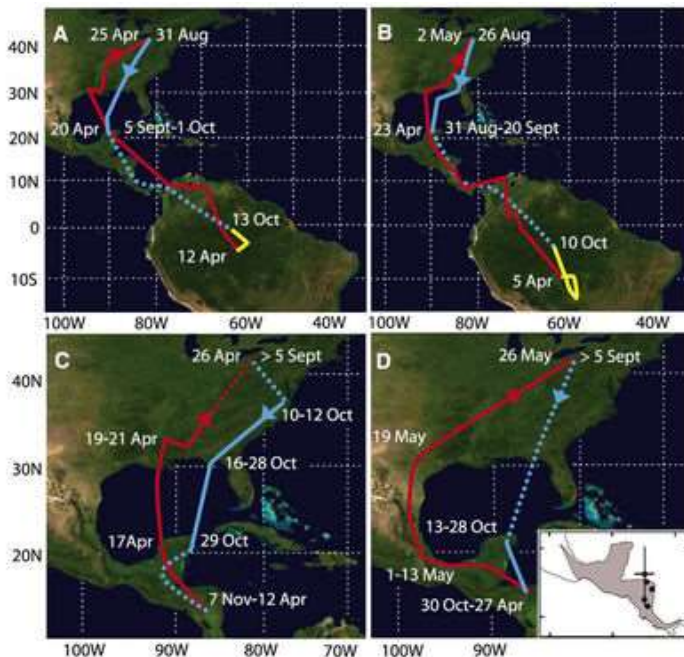


**“Frequent Fliers- New Discoveries in Bird Migration”**

Individual migratory behavior has been almost totally unknown until recently. Songbird numbers have been declining and we know there are many threats on the breeding grounds, but we do not know about all the threats they face during migration.

In 2007 there was a breakthrough in technology with the introduction of the mini geolocator, used by the British Antarctic Survey. Geolocators (1.5 grams in weight) can be placed on the back of birds to detect light levels every 2 minutes for as long as 1½ years. The light levels indicate exact time of sunrise and sunset, which tells researchers the location of the bird. They are archival devices, and the downside is the bird has to be recaptured in order to download the data.

In Dr. Stutchbury's study of Wood Thrush, the data collected by one geolocator showed that a thrush tagged on its Pennsylvania breeding grounds migrated over the Gulf of Mexico and reached its wintering grounds in Honduras on November 1. The bird remained there until April 21 and completed a 12-day migration, returning to Pennsylvania on May 3. Some birds can take much longer; for example, another Wood Thrush left Honduras on April 27 and did not cross the Gulf of Mexico. Instead it completed its migration over land and returned to the breeding area on May 26.

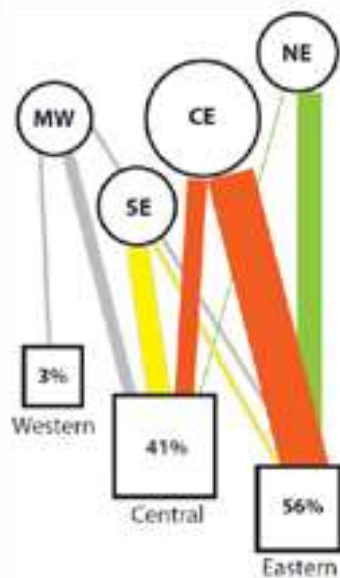


Maps from Stutchbury's work, showing geolocation tracks of individual Purple Martins (A and B) and Wood Thrushes (C and D) that bred in northern Pennsylvania in 2007. Blue=fall migration, yellow=winter range movements, red=spring migration. Dotted lines link locations when latitude could not be determined. Inset shows winter territory locations of tracked Wood Thrushes (dots) and the winter range for the species (shaded); the standard deviation for one individual is shown. [Image © Science/AAAS]

**Do different breeding populations occupy unique wintering grounds?**

“Connectivity” is defined as the extent to which different breeding populations mix or overlap during the winter. If separate breeding populations mix on wintering grounds they would have a low migratory connectivity; if they go to distinct wintering areas then connectivity is high. Knowledge of each breeding population’s wintering areas and degree of connectivity is very important when there is conservation concern, but we are only just starting to get answers.

Dr. Stutchbury and her team of collaborators studied Wood Thrush across their breeding range in Eastern North America. Geolocator results showed that most central and north-eastern populations winter in Honduras, Nicaragua and Costa Rica. Most mid-western and south-eastern birds go to Yucatan, Belize and Guatemala. It is difficult to define the boundaries between breeding populations because they cover so much area. It was much more efficient to place geolocators on the birds on their wintering grounds, which are much more compact, and this also allowed marking of juveniles. Juveniles and adults tracked from each wintering site tended to return to the same general breeding grounds, suggesting that juveniles return to their natal region.



Dr. Stutchbury’s research team were able to build a ‘migratory network’ with the data (the Holy Grail for migration) and found that over 50% of Wood Thrushes from North America wintered in eastern Central America (eastern Honduras, eastern Nicaragua and Costa Rica). Therefore, protecting forests in Nicaragua and Honduras would benefit over half the species. Another 41% of the Wood Thrushes overwintered in Belize, Guatemala and on the Yucatan, and a very small proportion of the species overwintered in the Mexican region of Veracruz. This has great implications for developing strategies to protect these birds, as habitat fragmentation from tropical deforestation is resulting in rapid changes where Wood Thrushes live. This kind of information can help identify which global deforestation hotspots are priorities for protection of migratory birds.

Migratory connectivity network for Wood Thrush breeding in different regions: Midwest (MW), southeast (SE), central east (CE) and northeast (NE). Width of colour-coded lines and percentages show the proportion of individuals tracked from each breeding region that travel to a particular winter region.

Dr. Stutchbury and her team also did a parallel study with Purple Martins. These birds differ greatly from Wood Thrushes in that they are colonial, migrate during the day and are aerial insectivores. By contrast the Wood Thrush is solitary, migrates at night and is an omnivore. Like other aerial insectivores, Purple Martins are declining, more so in the northern parts of the range. Dr. Stutchbury’s team tracked Purple Martins from many populations that utilize

the same wintering grounds in the heart of the Amazon in Brazil. This species has low connectivity -- there is no distinction between breeding populations on the wintering grounds, and they all spend the winter in the same general region. The exception is the western subspecies of the Purple Martin which all winter in the an area to the south and east of the wintering zone used by the eastern subspecies. Southern-most breeding populations arrive on the wintering grounds first, and northern breeders last. This research demonstrated that winter range maps for Purple Martins are incorrect and that the core winter range is much smaller than previously assumed. It was also found that Purple Martins heavily utilize places in Western Cuba and the Yucatan as stop over spots during their migration.

### Intra-tropical migration (ITM) and identifying conservation priorities

Migration is assumed to be costly, in terms of energy spent on migration and risk of predation. It would seem sensible, then, that neotropical migrants would fly to a specific destination and stay there. Wood Thrush do behave like this; they are fairly sedentary and can be banded and studied for several weeks. Geolocator data have shown, however, that not all species are sedentary on the wintering grounds. Bobolinks and Eastern Kingbirds complete intra-tropical migrations (ITM). When they arrive on the wintering grounds they move from one wintering ground to another. These movements are synchronized and can cover long distances. It was thought that some birds complete ITM due to changing weather patterns and availability of food. However, it appears that there is more to it than that and that birds that complete ITM are pre-disposed genetically to this type of migration and are not just “drifting” for resources. Birds that undertake ITM must presumably be shifting body physiology back to migration mode before moving from one location to another.

In Purple Martins only 50% of individuals complete an ITM; the other 50% are sedentary on the wintering ground. Several questions arise from this behaviour. Why do only some complete an ITM? What is the benefit? Is there a cost? Dr. Stutchbury and her team’s original hypothesis was that there was not enough of a resource to sustain the entire population, so some birds have to complete an ITM to get enough resources. However, the data showed no distinct differences between old and new sites in habitat, temperature or rainfall that might explain ITM, nor did sex or age of the birds play a role.

The team’s current hypothesis is that an ITM for Purple Martins is triggered by high local densities, resulting in limitation of roosting sites on the wintering grounds. Some late-arriving birds from the northern breeding sites pass over the core region in Manaus to winter further south, and as more and more birds arrive on the wintering grounds, more birds move away from the core area. Does that mean that the favourite area around Manaus is too full to be attractive? The larger southern populations of Purple Martins arrive first, and might fill up the core wintering area; although some of those birds will move on as well as the season progresses.



Female Purple Martin with geolocator “backpack.” The light sensor is located at the tip of the stalk protruding from the feathers. Photo by Tim Morton.

When breeding is finished, Purple Martins gather together in large numbers to roost communally. Being made up largely of water, Purple Martins are detected by North American NEXRAD weather radar stations. Birds leaving a large roost in the early morning show up as “donuts” on the radar as the birds spread out over the countryside. NEXRAD stations are lacking in South America, however, and the best method to discover roost sites there are GPS Archival Tags. These are new tracking devices that can provide researchers with 10-12 locations per year on a single battery. As with geolocators, however, the birds must be re-captured so data can be retrieved.

It appears that South American roosting sites may indeed be limiting, given that there are about 20 million Purple Martins in Brazil from July to October. Archival tags showed that islands are important for roosting, and even in the huge expanses of the Amazon, high quality island sites are finite in number. Moreover, roost sites are traditional and act as social attractors, such that birds are reluctant to use sites where no birds are already present. It does seem plausible, then, that limited roost sites within the martins’ core wintering range could cause the area to get “filled.”

**Questions following the presentation:**

Falls: Are martins territorial?

Not in the winter. Martins cram together in roosts, which may incur costs such as increased local competition for food and disease transmission.

Obbard: Is there a seasonal pattern in the insect prey on martin wintering grounds?

Nothing is known about this.

Hussell: In roost sites in the US where radar is present, what is the distance travelled to forage? Could martins deplete a local food resource?

This is a difficult question to answer as it is hard to study. There must be more to shifting of wintering areas than not being enough room, but we just don't know what.

Sutherland noted that Purple Martins in Ontario seem to be disappearing at a faster rate than those in other places. However, they are not a COSEWIC species.

Why do martins pick islands as roost sites?

There is safety in numbers and fewer predators. One martin roost is in a park in the heart of a city in Brazil, and another in the parking lot of a Walmart in Austin, TX. It seems that once birds are locked into sites they have been using for generations, they'll keep returning.

Dunn: Is the movement away from the core martin wintering area restricted to late arriving birds?

Late arrivals do overshoot from the beginning, but the size of the wintering range grows over time and even early arrivals begin to move. This brings up more questions. What do they gain? How do they know where they are going?

E. Addison: It seems logical to assume that movements are based on insect emergence. Is it possible that the Amazon goes through flooding?

For some, yes. For Veery, seasonal flooding may be the reason they have ITM of up to 1000 km. ITM behaviour must be just as evolved and ingrained as "regular" migrations.

Bryant: Have other researchers also constructed migratory networks?

No, and the few shown based on others' work are Stutchbury's interpretations of their data. There are not enough researchers studying enough populations right now. Her goal is to make population models that allow us to ask questions such as, what happens to species X if you cut down half the forest in Nicaragua, the United States, or Guatemala? What's worse: cutting down forest in the breeding or in wintering areas? Where do we put our money and conservation efforts?

Daniels: Might migration habits remain from behaviours shaped during glacial periods?

Migration behaviour is genetically based. Behaviour that results in increased costs and no clear benefit should be selected out in 50 to 100 generations – i.e., current behaviour is presumed to be adaptive.

Reading: Noted that habitat loss in Nicaragua is disastrous, though a small area to the east is meant to be preserved

Shade grown coffee plantations are especially important in places where forest has been destroyed. Birds and Beans help to support the Nicaragua shade coffee industry which helps to provide some habitat to birds.

Bob Curry thanked the speaker.

## **OBSERVATIONS**

John Riley reported flocks of 300 Snow Buntings and a dozen Wild Turkey in Mono Twp. On the way to the meeting, he watched a Cooper's Hawk near the Vet Center at Sunnybrook, and saw it swoop in to kill and then eat a pigeon.

John Carley saw river otter at Black Creek on 30 December.

David Tomlinson observations of boreal warblers from a 1.5-acre wood lot in Cuba from 2003 to now. There are several fruiting and flowering bushes and trees on the property. At the start, 9-22 warblers were observed. Over time the number of trees and shrubs decreased, but the number of warblers seems to have increased to 26-32. He noticed a change in behaviour from foraging in flocks to individual defence of territories, and believes the warblers are eating ants.

George Bryant brought three new books:

1. Robert Bateman- Life Sketches: a Memoir
2. Michael Runtz- Dam Builders: The Natural History of Beavers and Their Ponds
3. Roy MacGregor- Canoe Country: The Making of Canada

The meeting was adjourned at 9:10 p.m.

## **CORRESPONDENCE**

### **Application for membership: Justin Peter**



Born in Ottawa, Justin has been interested in natural history since he was a young child. Initially his mother introduced him to growing plants from seed and the care of plants more generally, and his father imparted a strong interest in animal life. In Grade 1, Justin received the Reader's Digest North American Wildlife and immediately made heavy use of it...the bird pages fell out of the binding within weeks. His parents and family friends gradually stocked an extensive nature book library for him, and telling others about nature became a schoolyard and neighbourhood pastime. Soon thereafter, a family friend introduced him to field birding at Charleston Lake Provincial Park where he was finally able to make the 'link' between birds in his books and in the wild.

When he was 8, the family moved from a condominium district to a detached house with close access to acres of woodland and brush along a limestone scarp in the highest part of Ottawa. It was during his explorations here that he was confronted with the variety of plants and animals to be found in the area. From here he came to be interested in ecology. His discoveries over the years also provided much more material to study and about which to tell the neighbours. At age 14, a family

friend invited him to attend the birding course he was teaching for adults. Justin fairly quickly assumed the role of unofficial assistant in the classroom as well as co-leader and, later, leader of the field excursions.

Despite his strong natural history interests in his childhood and teen years, Justin pursued what he thought might be more lucrative job opportunities when he enrolled at the University of Guelph to complete a B.Sc. with a specialization in Biomedical Toxicology. It was nonetheless a fortunate choice as the university's Arboretum provided countless more hours of opportunity for study, especially by providing a chance to become familiar with Carolinian trees. After graduating, Justin moved to Seattle to pursue a Ph.D. in Pharmacology at the University of Washington. After a year he decided that the medical sciences were not his calling, so he returned to Ontario and re-directed his interests back to the outdoors, initially taking some University of Guelph correspondence courses. One of the courses introduced him to Aldo's Leopold's Sand County Almanac, which would become a major influence. He then began a Master's degree in the University of Waterloo's Faculty of Environmental Studies; however, work opportunities quickly developed as he landed a job as a seasonal, and then full-time interpretive naturalist at Gatineau Park, a federally-managed park in Quebec near Ottawa. Besides providing the opportunity to be immersed in the wilder part of his home region, the job got him interested in the art and science of interpretation, including the process of visitor learning and motivations. Why do people care about nature? What are they willing to do for wildlife? Three years later, he pursued these questions while beginning full-time work as Senior Park Naturalist at Algonquin Park, where he worked for almost seven years organizing the park's educational programming based at the Visitor Centre, recruiting and mentoring promising young interpretive naturalists, and assisting with various park management activities. At Algonquin, he developed his administrative and supervisory abilities and also had the opportunity to work with Dan Strickland and Ron Tozer.

Justin has done many side-projects. He married his interests in birds and in languages by participating in a migration monitoring program at the Strait of Gibraltar in Spain, and also completed a stint in bird-banding at the Observatoire d'oiseaux de Tadoussac in Quebec. He also enjoys publishing notes on field observations whenever possible and has done so to Ontario Birds and the Canadian Field-Naturalist. Most recently he worked as lead reviewer for the 2015 re-print of the popular book, Trees of Algonquin Provincial Park. He has always liked leading bird and tree excursions and presenting talks, and is regularly involved with the Toronto Ornithological Club, Ontario Field Ornithologists and the Ottawa Field-Naturalists' Club. He has been an occasional bird-bander at Toronto's Tommy Thompson Park in Toronto. He is also one of the administrators of the Facebook group Ontario Birds. Academically speaking, Justin is fascinated by ethology, biogeography, notions of sympatry, rarity, and evolution.

Justin moved to Toronto in 2013 to begin work with Quest Nature Tours as Director of Programs, where he could continue to apply and expand his interests in natural history interpretation (and worldwide travel) while applying his administrative and organizational abilities.