



THE BIRDFISH

FALL 2019

Churchill Northern Studies Centre
Newsletter

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Cover Photo by Anna Solecki

Malaise traps are tent-like structures that tend to catch insects that fly up when they encounter an obstacle



A Bird in the Hand...

By Marley Aikens

Photo of plover: Laura McDuffie

AS THE THICK PACK ICE OF HUDSON BAY RECEDES IN early June, the crisp air near Churchill, Manitoba is alive with migrating birds. These birds have undertaken arduous journeys to reach the Arctic's Edge, often travelling thousands of kilometers to breed in the rich wetland ecosystem of the Hudson Bay Lowlands. In the summers of 2018 and 2019, I set forth on a journey of my own, travelling from Peterborough, Ontario to study the breeding and migration ecology of shorebirds.

My MSc research focuses on the semipalmated plover, a small, quirky shorebird that our team has been studying for 20+ years in Churchill. The plover project, led by Dr. Erica Nol at Trent University, is one of the longest running studies on arctic shorebirds in the world! From this research, we have a well-rounded understanding of semipalmated plover breeding ecology, including pair dynamics, habitat selection, survival estimates and factors contributing to breeding success. My research builds upon this foundational work to understand links between breeding and a magnificent yet understudied period of the annual cycle: migration.

My goal is to figure out where, when and why individual birds



Marley Aikens holding a banded plover

migrate after breeding in the subarctic, with hopes of identifying critical stopover habitat, migration routes and causes of migration behaviour. To track the incredible migrations of these aerial athletes, we outfitted hundreds of birds with tiny radio transmitters that emit a signal unique to each individual bird. As a bird migrates, its signal is picked up by the Motus Wildlife Tracking Network ("Motus"), a collaborative system of over 400 stationary receiving stations across North and South America. Dozens of new receiving stations are popping up each year, allowing researchers to track movements of individual birds in unprecedented detail.

Near Churchill, our team has contributed to the network by building five Motus receiving stations, including one tower in Wapusk National Park and another right at the CNSC! These towers collect data not only for our project, but for several other Motus projects tracking arctic breeders. For instance, endangered rufa red knots tagged in Delaware Bay, New Jersey are often detected in Churchill en route to their high arctic breeding grounds. The collaborative nature of Motus is key to its growing success in the field of movement ecology. So far, our tracking data show that successful breeders fly the coop shortly after their chicks are old enough to survive alone,

To pinpoint and fully address these declines, we need to understand the complex connections between breeding, migration and wintering habitats and then develop robust, community-based conservation plans.

but failed breeders (birds whose nests were predated or otherwise destroyed) stick around, presumably in hopes of re-nesting before the short breeding season comes to an end. After leaving Churchill, birds travel along three distinct migration routes: **1)** through the Great Lakes region; **2)** along the James Bay and Maritime province shore-lines or; **3)** a direct continental flight to the Delaware Bay area, where birds from all

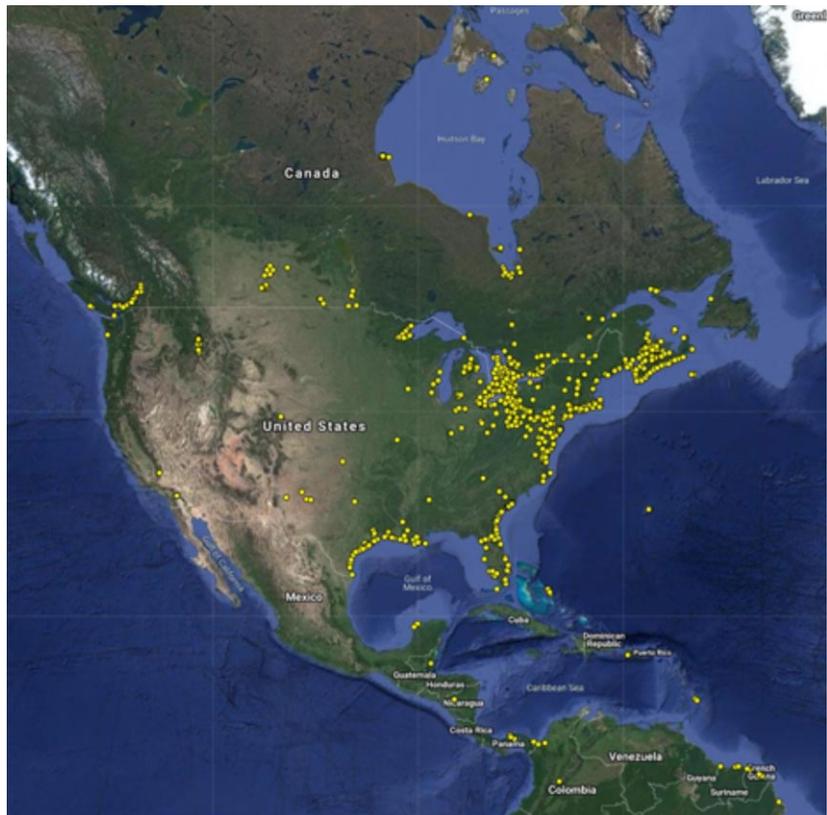
three routes tend to reunite for a bite to eat and rest before continuing south. In 2018, tagged semipalmated plovers were detected as far south as French Guiana and Suriname, only weeks after leaving Churchill. That's a remarkable feat for a 45 g bird!

From this ongoing work, we are unlocking secrets of semipalmated plover migration and validating the use of Motus in the North. I am hopeful that our research will inspire the deployment of more Motus stations in the Arctic, which would expand its spatial range and consequently, its potential. This is a critical time for shorebirds – on average, populations have declined by an estimated 70% since the 1970's, and species breeding in the Arctic have been hit the hardest. To pinpoint and fully address these declines, we need to understand the complex connections between breeding, migration and wintering habitats and then develop robust, community-based conservation plans. My MSc research is only one piece of this ecological puzzle, but it is definitely a step (or a flight!) in the right direction.

This research would not be possible without the generosity of the W. Garfield Weston Foundation and the logistical support of the amazing CNSC staff. I am incredibly thankful for your contributions to Arctic research – together, we truly can Understand and Sustain the North! ❁



Plover



A Map of all the active Motus receiving stations in North and Central America as of September 2019.



Diversity of Flies in the Subarctic

By Anna Solecki

Why do we find species where we find them? This question is one asked by community ecologists who strive to understand patterns of species occurrences in the natural world. My research, in particular, examines the diversity patterns of flies in the North.



Why flies? Flies (Diptera) are the most abundant, species-rich and ecologically diverse insects in the Arctic, and are integral to every terrestrial food web in the North, yet research on them is limited. One reason for this is that many fly species are unknown. However, the magnitude of reported changes linked to climate change in the Arctic is large and warming temperatures have already been linked to changes in some Arctic insect groups. Thus, it is critical to study this system and inventory the current fly fauna present in northern habitats. Understanding the factors affecting their current diversity patterns may help us predict future changes.

For my PhD research, I am investigating the factors that affect northern fly diversity at local habitat and large continental scales. At small scales, meter-scale differences in temperature and moisture are known to impact insect assemblage composition overall, but is this the case for flies? And, what are the mechanisms underlying their patterns? To examine these questions at a local scale, I have chosen Churchill, MB, as my study site. Located in the Subarctic, Churchill is a transition zone between boreal forest and tundra. Differences in community composition between these two habitats may inform how fly communities are formed. Compared to the boreal forest where there is tree cover, the tundra is a harsher environment with regards to wind exposure for instance. A harsher habitat may filter for species with certain specific traits, such as flies with small wings to minimize wind dispersal. Thus, examining community structure at multiple scales between these two different habitats with different pressures may provide insight into the mechanisms involved in forming these communities.

For this study, I sampled flies in the Churchill region during the summers of 2016 and 2019 at the peak of fly activity in July using a hierarchical design at multiple spatial scales. Four sites were selected in each habitat (tundra and boreal forest) for a total of 8 sites in Churchill. Each site was sampled with six pan traps, where each pan trap serves as its own unit that will be examined separately. Pan traps are small, shallow liquid-filled yellow bowls that are dug into the ground. They collect insects that are attracted to bright yellow colours (such as pollinators) or that stay close to the ground, either walking or flying. Malaise traps were also used at each site to characterize the overall diversity. Malaise traps are tent-like structures that tend to catch insects that fly up when they encounter an obstacle.

Currently, the material collected for this study is still being sorted



Malaise traps



Malaise head



Malaise jar

since the diversity and abundance of insects (and particularly flies) is so high in the Canadian North. Once all flies are retrieved from samples, I will be able to start examining patterns. However, many of the fly species collected are likely to be unknown to science and unnamed. One way to examine a large species assemblage in such a context is to examine their molecular diversity, and, more specifically, to use DNA barcodes. The DNA barcode region for animals is a short gene sequence which can be used to assign specimens to a group which often represents a species when formally examined. Once finished, this study will contribute to our general knowledge on the importance of considering scale when looking at species assemblage. As well, understanding how fly communities are structured at a transition zone may help in the future to predict what indirect changes may occur based on a changing climate. ❄️

Learning How to Adapt to Field Conditions

By Alex Harman

I recently graduated from the University of Wisconsin-Platteville. I have been collecting and studying insects since I was four years old and have just started pursuing my master's degree at Oklahoma State. During my freshmen year at UW-Platteville, I attended a talk given by professors and students on their recent short-term study course focused on sub-arctic, boreal, and coastal ecology, based out of the Churchill Northern Studies Centre. As I had recently begun birding, I was amazed at their photos of floating eiders, soaring terns, and aggressive jaegers, and decided I had to research this place a bit more. That night, I found that the butterflies of the region were, in my opinion, even more impressive than the birds! From a variety of orange fritillaries, brilliantly patterned with spots of silver, gold, and black, to a half-dozen species of sulphurs ranging from pale cream to burnt orange, the butterfly diversity was stunning. Many of these were high arctic species, for which Churchill is the most southern point in their range, species I would never encounter in Wisconsin. It was that night that I decided that if I had the opportunity to go on this trip, I would take it!

This past spring, that opportunity presented itself. In preparation for the trip, we had weekly class meetings to discuss various aspects of the course and trip. One course requirement was to conduct an on-site research project. It didn't take me long to devise a project that would allow me to spend a substantial amount of time doing what I do best, spending time in the field netting butterflies. The plan was to investigate if the three dominant groups of butterflies in Churchill: lesser fritillaries (*Boloria* spp.), sulphurs (*Colias* spp.), and satyrs (*Satyrinae*) were active at the same time of day, or if they were staggered. I hypothesized that the dark satyrs would be able to absorb more solar energy, and therefore would be active for a longer period than the light-colored sulphurs, with the fritillaries falling somewhere in the middle. As the trip drew nearer, with careful planning my classmates and I finalized the details of our projects. At this point, there was only one thing that could stand between me and success: the weather.

As anyone who has been to Churchill can attest, placing bets on the weather is a risky game to play. It can change dramatically, going from hot and sunny to cold and drizzly within a day, which is precisely what it did! Our first full day on site the weather was perfect, and the butterflies even more abundant than I expected. The morning was spent on the tundra, and I barely took notice of the clouds of mosquitos while I was busily chasing *Melissa*, *Jutta*, and *Polyxenes* Arctics around the tundra. I even found three *Polaris* Fritillaries, my number one target of the trip! On an afternoon trip to the Twin Lakes area,

I encountered a dozen Boreal Long-lipped Tiger Beetles, a species that had only been collected in the area a couple times! However, as I stood by the bonfire that evening on the longest day of the year, the dropping temperature and forecast indicated that I would need to find a new research project for the week.



While butterflies are usually active only during pleasant weather, many arthropods are not so particular. Beetles, spiders, and ants all were relatively indifferent to the adverse conditions, as they lack the fragile, scale-covered wings that give butterflies their popularity. As an alternative idea, I set pitfall traps, cups buried into the ground that collect terrestrial arthropods, in three different environments—dry tundra, wet tundra, and tree island—to compare ground-dwelling arthropods from these different sites.

While the results suffered a little from time constraints (the traps were only left out for two days), the results we did get were fairly interesting. The vast majority of the taxa we collected were only found in one of the habitat types, suggesting that there was high specificity to each one. This is in contrast to the butterflies, which, being more mobile than the ground-dwelling species we collected, blended throughout the assorted habitats. Of particular interest to me were the ground beetles, which included *Carabus taedatus* and a *Notiophilus* sp., as they were both species I had kept an eye out for but failed to find while exploring the area.

Overall, the trip was a wonderful experience and I hope to return someday! In addition to all the insects I collected, I also saw over one hundred bird species over the course of the trip, as well as some of the other species Churchill is best known for, such as arctic hares, beluga whales, and foxes. I'll end with a quote that is often (incorrectly) attributed to Charles Darwin, but I feel is applicable to the unpredictability of field work as well as natural selection:

"It is not the strongest of the species that survives, nor the most intelligent; it is the one most adaptable to change." ❄️



Going Full (Subarctic) Circle!

By James Kushny

DO YOU REMEMBER...YOUR FIRST VISIT TO CHURCHILL? ...YOUR FIRST ADVENTURE TO THE SUBARCTIC AND ARCTIC? ...YOUR EXCITEMENT OF POSSIBLY SEEING A POLAR BEAR? A ONCE IN A LIFETIME TRIP!

My first experience in the north was 29 years ago as an undergraduate student. I discovered that the Churchill Northern Studies Centre hosted field courses offered by universities across Canada and the U.S.A. As an undergrad at the University of Toronto, I made an inquiry with the lead instructor (the renown Plant Ecologist Dr. Robert Jefferies) about the 'Arctic Ecosystems' field course. "Uncle Bob", as he was affectionately known, ended up offering me an opportunity to work as a field assistant at a remote field camp (Nestor 2 at La Perouse Bay), in what is now Wapusk National Park. The CNSC played a vital part in providing resources and logistics to the field camp. Bob Jefferies was an early and frequent contributor to the CNSC and played a key role in establishing its vision and mandate.

As I continued on to graduate studies, the CNSC supported my research and study of caribou herds along the Western Hudson Bay Coast. As one of the most accessible northern field research stations in Canada, the CNSC provides year-round support to scientists involved in research. Along with providing logistic support and facilitating my genetic

There is a captivating feeling about the North that one immediately experiences upon arrival: the way of life; the natural beauty; the meeting of three distinct Eco-zones (Marine, Boreal and Subarctic) and the spirit of the people who live here.

investigation into caribou herds, the Northern Research Fund (NRF) enhanced my research financially by contributing user-days and vehicle-days.

As a researcher, I have had the opportunity to instruct field courses at the CNSC. The Centre offers a perfect destination for field course offerings, providing a safe base and logistic support for exploring the subarctic. As a teacher, I have had the opportunity to share my experiences in the subarctic with a range of learners. During 'Whales, Trails and Polar Bear Tales'



James Kushny with students

(a workshop for children) I read the children's book on polar bear conservation entitled 'Winston of Churchill' to group of students in grades 2 and 3 who were visiting from the Kortright Centre for Conservation in Ontario. I have also had the privilege of sharing my northern experiences with many participants of the Road Scholar Program, including a retired US Naval Commander from San Diego (celebrating his 90th Birthday!). As a life-long learner, my perspectives from Churchill and the CNSC make me feel just as excited today about the North as I did on the day I first stepped off the plane arriving in Churchill 29 years ago. Today, I have the honour and privilege of contributing to the direction and future of the CNSC as a member of the board of directors.

Churchill will always kindle that same excitement I had when I first visited here. There is a captivating feeling about the North that one immediately experiences upon arrival: the way of life; the natural beauty; the meeting of three distinct Eco-zones (Marine, Boreal and Subarctic) and the spirit of the people who live here. It is a joy to be able to share the exhilaration of viewing beluga whales and polar bears or discovering the emergence of a wildflower species. The circle, and cycle, continues. ❄️

Churchill Keeps Drawing Me Back!

Visitor returns, 4 times and counting!

By Kelly Kandra, 2018 Volunteer

Nancy Hoecker, a pharmacist and master gardener from Springfield, Oregon, first came to the Churchill Northern Studies Centre in February 2008 with EarthWatch Institute. Being an avid volunteer, she was eager to take a vacation that gave her opportunities to get hands-on experience in the environment. However, having gotten divorced in 2006, Nancy also wanted a vacation that didn't charge extra because she was a single person. That's how she found Earth Watch.

Ending up in Churchill wasn't necessarily part of Nancy's plan. After searching for volunteer travel organizations on the internet, Nancy found that Earth Watch offered a search feature for tours by month. Since Nancy could only travel during certain times of the year, she clicked the February box and up popped the EarthWatch expedition at CNSC. "What really grabbed me," says Nancy, "was with the Churchill expedition you could build an igloo and spend the night in there. I've now done that twice."



As of October, 2018, Nancy has visited Churchill four times total. When she visited with Earth Watch again in February, 2011, the new CNSC building was close to being completed. It looked so nice she thought to herself, "Oh, I have to come back and see the new building!" She then returned in September 2014.

Finally, in October 2018, she came back to see the polar bears.

"It was great," says Nancy of being a participant in the Lords of the Arctic Program. "It was my first time in a helicopter. That was fun. I could handle doing more of that."

Being a master gardener, Nancy was especially interested in learning about Rocket Greens, the self-contained garden on CNSC's campus that operates out of a shipping container. Through the container's heavy insulation and energy efficiency, Rocket Greens is able to provide 250-400 pieces of fresh food to Churchill residents every week. According to Nancy, if she was living in Churchill she'd definitely be a subscriber. "I'd want some of those greens in my diet!"

Of course, polar bears were also a part of Nancy's Churchill experience. "My favorite part about being on the tundra was when a polar bear came up close to the tundra buggy." The bear got so close, Nancy could even see it sniffing the tires. Nancy recommends that anyone who wants to visit Churchill should just do it. "It's great for single people because you don't have to have a partner and learning vacations can be less expensive than other types of vacations. You have fun and you learn a lot!"

She's also not done with Churchill just yet. After her Lords of the Arctic tour, Nancy had plans to visit Brazil and Iceland. But when asked if she would ever come back to Churchill for a fifth time, Nancy laughs. "I'm now thinking of coming back and volunteering sometime as a Studies Centre volunteer. I'd like to come back in the summer to see the belugas and the wildflowers." ❁

Established in 1976, the Churchill Northern Studies Centre is an independent, non-profit research station located along the western coast of Hudson Bay.

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Have you made a Lasting Impact on northern research and education? If you are receiving this newsletter you have. All of you have created a lasting impact by donating directly, participating in a course, conducting research, instructing a course, volunteering your time or by becoming a member of our organization. We would like to take this opportunity to thank you and let you know that you have made a difference. Every year we face new challenges but what remains consistent is your dedication to helping us continue our mission here in the north. **Thank You!**

How can you continue to make a Lasting Impact on the north? Tell everyone around you about your experience with us in Churchill. By becoming an ambassador for the Churchill Northern Studies Centre (CNSC) your impact on northern research and education will be limitless. You can recommend us as a destination for learners of all ages, school group trips, conferences and meetings, credit and non-credit university courses, a place to conduct research from any discipline and as a charity worthy of support of any amount. **Thank you for all you do for us!**

In honour of Dennis Macknak, we are starting a scholarship fund to annually award a local youth pursuing science and/or education. If you want to help us jump-start this fund, please choose to donate to the Birdfish Fund and make a note that you support the scholarship!

contribute

Your contribution is still needed to ensure that WE meet all the expectations that YOU, our participants, researchers, educators, donors and members have for the future of the CNSC. No contribution is too small. Every gift counts.

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Visit our Canada Helps Giving Page – <https://www.canadahelps.org/en/charities/churchill-northern-studies-centre/>

Contact Kim at **204 675 2307** or daley@churchillscience.ca – and she will process your donation personally.

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