❄ 11th annual newsletter ❄

The Snow Bunting Report

CANADIAN SNOW BUNTING NETWORK

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This year's highlights

❄ New research students and their projects at the University of Windsor (UWin)

❄ Updates on last year's projects

❄ A successful ongoing Citizen Science project in Labrador

❄ Monitoring by University of Sherbrooke

❄ Snow bunting in Florida

❄ News from Iqaluit and Alert

Welcome back to the 11th annual Canadian Snow Bunting Network! This year we are happy to highlight the research work of students and some exciting article about snow buntings from birders and community members!

If you have any questions about Snow Bunting research in Canada, please feel free to contact Oliver Love at olove@uwindsor.ca

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Newsletter Editors: Baptiste Courtin, Inès Fache, Marianne Turcotte and Sachin Anand

A True “Snow Bird”: Snow Bunting Sighting at Merritt Island, Florida

by Becki O’Brien, *Birder in Florida*

A remarkable avian visitor has captured the attention of the birding community in Florida this Fall. A snow bunting (*Plectrophenax nivalis*), typically found in the Arctic tundra and rarely seen in Florida during winter migrations, was discovered in the marshy areas of Merritt Island in late November 2024.

This unexpected visitor, thousands of miles from its usual range, remained in the area from around November 26th until December 11th, providing an extraordinary opportunity for observation and documentation. The bird, displaying typical snow bunting behavior, was frequently spotted foraging among the grasses at ground level, exhibiting the species' characteristic preference for open areas. Larra Wanders, a local to the area, was able to observe the snow bunting and commented, “I was so excited to get to see this rare sighting. I've never seen snow before and definitely not a snow bunting. As someone who tries to add to my e-bird list regularly this was special. I'm glad this little one got so many people out in nature as well.”

What makes this sighting particularly intriguing is not just its location but the bird's unusual tolerance of human presence. Throughout its stay, the snow bunting allowed countless wildlife photographers and birding enthusiasts to capture detailed images, providing invaluable documentation of this rare occurrence. Another local birder, David Dowling, observed the following about the bunting’s demeanor, “I found the behavior of this gem to be most unusual. On my first visit he literally ran between my legs showing no signs of fear, I almost stepped on him, as he rushed to his spot and began eating.”

The presence of this species so far south raises interesting questions about migration patterns and potential environmental factors. While individual birds occasionally stray from their typical migration routes (a phenomenon known as vagrancy), the appearance of a snow bunting in Florida is exceptionally unusual. Several factors might explain this occurrence, including:

- Disrupted navigation due to recent storms
- Changes in traditional Arctic feeding grounds
- The influence of shifting weather patterns on migration routes

The extensive photographic documentation collected during this period will prove valuable for researchers studying avian migration patterns and the potential impacts of environmental changes on Arctic species.

As of the first week of December 2024, the snow bunting has not been observed in the area, suggesting it may have continued its journey. While its ultimate destination remains unknown, this remarkable visitor has provided an unprecedented opportunity for citizen scientists and researchers alike to document and study a species far from its typical range.

Tracking Snow Bunting Migration in Labrador

By Cheryl Davis - *A birder who calls New Brunswick home*

In 1997 we moved to Wabush, Labrador. On April 12th the following year, hundreds of snow buntings invaded our yard and feeders. A few years prior, on April 22nd, I had lost my mom. Feeling melancholy on that date in '98, I went for a drive and was blown away by the abundance of migrating snow buntings in the area. I counted 1710, and 1998 became the beginning of a yearly 'Snow Bunting Count' for Western Labrador. With April 22nd also being Earth Day, it seemed a natural fit.

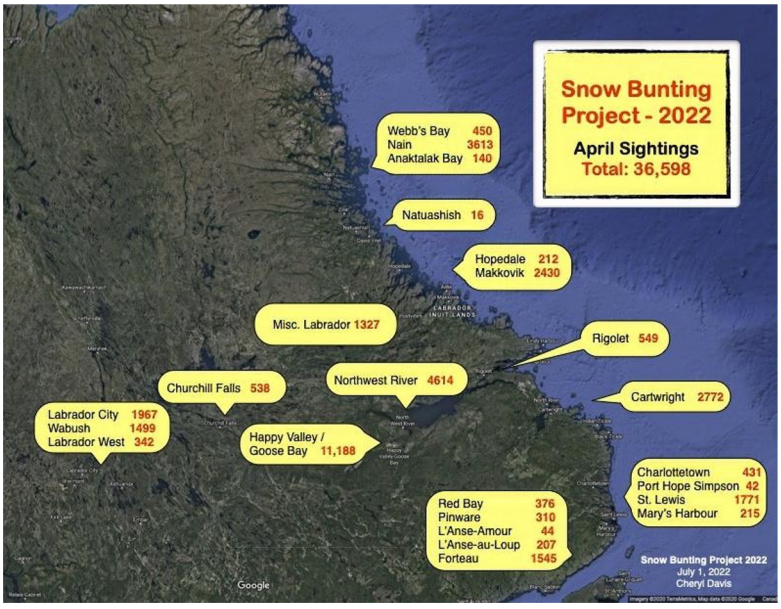
After our move out of Labrador in 2003, Gordon Parsons from Labrador City continued the 'Snow Bunting Count' until his death in early 2018. It looked like the 20-year-old tradition was going to end.

Attempts to continue the 'Snow Bunting Count' in 2018-19 failed. In early 2020 an email arrived from Regina Wells with Environment and Climate Change Canada, and I learned the importance of collecting snow bunting data, especially for the Indigenous governments of the region. Prior to his death, Gordon had suggested that the April 22nd date be changed to an earlier one, as he thought migration patterns were getting earlier. Taking all of this into consideration, 'The Snow Bunting Project' was born in early 2020. In 2024, it was renamed the 'Snow Bunting Project of Labrador'. Using a Facebook group by the same name (https://www.facebook.com/groups/2914441521910597), data is collected from Jan-May, rather than just one day in April. Project participation has been a success. In April 2024, snow bunting sightings came in from 34 Labrador communities with 14,876 bunting sightings (Labrador Pop: 26,655).

Simplicity works; people are invited to post to the Facebook group their estimated highest single daily bunting sighting so as not to double count, along with their location. Pictures, videos, and GPS coordinates are encouraged. Data is then collected from the Facebook group and input into a monthly spreadsheet, which is broken down by community and by date. The spreadsheet also highlights April 22nd, which was renamed the 'Gordon Parsons Memorial Snow Bunting Count', making it a good date to push for end-of-month sightings. Then, final data is sent to Environment and Climate Change Canada, where GPS mapping is done to track spring movements of the Labrador buntings on a week-to-week basis.

Spin-offs from the Project include: The 'Snow Bunting Network', setting up banding stations in several Labrador communities over the last 2 springs, including Forteau, where long-time birder Vernon Buckle has recently become a CSBN bander.

The annual migration of snow bunting has endeared itself to the people of Labrador for centuries, weaving their spring arrival into the very fabric of the region's traditions. This, along with a simple drive in 1998, and the engagement by those throughout Labrador who send in their sightings, has built an online community, and the 'Snow Bunting Project of Labrador' has become a Citizen Science success story. To those within and outside the Labrador borders - Thank You!



9 years of monitoring by University of Sherbrooke

By Patrice Bourgault - *Ph.D. Biol.*
Department of Biology, University of Sherbrooke

The Department of Biology at the University of Sherbrooke has been modestly (but passionately!) involved in the winter monitoring of snow buntings in the southeast of Quebec for the past 9 years. Initially, the project aimed primarily to enhance the practical training and experience of our undergraduate students in ecology. The program places a strong emphasis on field training, which includes teaching the various techniques commonly used in ornithology. Depending on seasonal opportunities, we try to teach basic methods such as monitoring the nesting of swallows in nest boxes, capturing migrating passerines with mist nets, or even trapping and banding at winter feeding stations. Our students greatly appreciate these opportunities to interact with birds, but the most popular activity by far remains the winter capture of snow buntings!

Students are always amazed to find themselves in such an unusual, even exotic, setting! Not only are most of them unaware of the existence of this unique species, but they are even more surprised to realize that such a small bird can thrive in such a hostile environment! Indeed, students quickly experience the reality of research in a winter context: waiting for birds in a windy field with clothing that is never warm enough, frozen fingers, loss of dexterity during handling…

Despite these challenges, students are excited to hone their bird-handling skills in this very specific context. We also take advantage of these field outings to address topics studied by different researchers in the network, such as differential migration, variations in maintenance costs in cold and unpredictable conditions, or even adaptation to climate change in northern migratory species.

Of course, we are pleased that the data collected during our activities contribute to the banding efforts led by the Canadian Snow Bunting Network. Since 2016, we have captured nearly 700 individuals, including some local recaptures and a few recaptures from elsewhere in Quebec and even from our colleagues in Ontario. This always generates great excitement among our students! Naturally, southern sites like ours are increasingly impacted by climate change, which unfortunately shortens the winter seasons drastically. We therefore cross our fingers each year hoping to experience at least two or three weeks of truly cold and snowy conditions.

I would like to thank all those who have contributed, through their diverse experiences, to making this educational project relevant, interesting, and credible over the years: Pierre-Alexandre Dumas, Oliver Love, François Vézina, Rick Ludkin, Catherine Geoffroy, Chelsey Paquette, and Marianne Turcotte. I would especially like to thank the Lieutenant family of the municipality of Stoke for their openness in allowing the passage of strange characters across their fields each winter... Thank you!

New graduate students at University of Windsor

A Noisy Narrative
By Angelina Kemp, MSc student at UWindsor

As Iqaluit, Nunavut's capital expands, so does the noise from vehicles, construction, and daily human activity. While urban noise is something humans learn to tune out, it can create new challenges for Arctic wildlife, including the snow bunting, as these songbirds rely on vocal signals like alarm calls to warn one another about danger. However, in a noisy environment, those calls could be drowned out, putting their survival at risk. A key adaptive trait for urban birds is their degree of behavioural adaptive capacity, allowing them to quickly adjust to learn and tolerate environmental changes. Birds may flexibly respond to noise pollution by learning to recognize vocalizations amid noise, habituating to it as a non-threatening stimulus, or enhancing visual detection by increasing vigilance or minimizing distractions.

My research seeks to examine how urban noise affects the ability of snow buntings to perceive alarm calls and their overall vigilance behaviour. Using playback experiments at feeding stations around Iqaluit, I will test their reactions to different sound treatments. By observing behaviours like how quickly they flee, how often they scan for threats, and how long they stay at feeders, I hope to determine how these birds respond to noisy environments.

Additionally, studying the impact of noise on Arctic wildlife not only enhances our understanding of northern regions but also provides opportunities for collaborative research with local communities. The Inuit of Nunavut continue to play a vital role in scientific exploration; however, meaningful engagement initiatives for Inuit youth remain limited, especially within environmental research. Thus, my thesis will also expand on the development of inclusive engagement initiatives with community members, governing agencies, and educational establishments in Iqaluit, to increase Inuit youth participation in environmental and songbird research. Through co-developed workshops, school presentations, and hands-on learning, I aim to produce a collaborative research project that fosters the development of stronger community stewardship efforts.

This study will provide real-world insights into the species' behavioural flexibility, by examining their responses in their natural habitat. It will also assess the potential of northern urban zones to support these birds amid habitat alterations and climate change. By aligning scientific goals with youth and community involvement, this project fosters reconciliation, knowledge sharing, and co-development between researchers and Inuit communities.

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New Birds on the Block: Studying Snow Bunting Behaviour in Iqaluit

Rachel Dow, MSc Student at Uwindsor

Species worldwide are facing unprecedented changes from multiple sources such as habitat loss, climate change and human disturbance. With these changes, species are forced to shift to new environments or persist in changed environments through behavioural flexibility. The global expansion of urbanization has drastically altered many environments, and an area of increasing interest is how certain individuals of a population may be successful within urban environments while others remain restricted to rural areas. Research focusing on behavioural flexibility in bird populations has shown that urban birds tend to be less fearful of humans, more likely to explore new food sources and be more aggressive towards predators than rural birds. Despite ongoing infrastructure changes in the north, our understanding of effects on Arctic species remains limited.

Historically, Arctic songbirds nest within the tundra; however, with recent northern development, birds have begun nesting within Arctic cities. Understanding what may allow certain individuals to be successful in urbanized areas is relatively unexplored in Arctic environments. Iqaluit is the largest city in Nunavut with a growing population and rapidly progressing industrial development. Iqaluit is also surrounded by natural habitats, which is also found both within and outside the core of the city leading to many potential nesting habitats for different Arctic migrant songbirds. We recently began documenting buntings nesting within Iqaluit across an urban gradient, creating an opportunity to examine the behavioural responsiveness of this breeding bird to urbanization.

The overarching goal of this study is to determine if snow buntings may be distributing themselves throughout Iqaluit depending on their individual sensitivity to urbanization. Specifically exploring how exposure to urbanization may influence an individuals' fear of humans, willingness to approach a new food source, and responsiveness to a novel object. This study provides insight into the behavioural mechanisms that may allow buntings and possibly other Arctic songbirds to adapt to a rapidly changing world and therefore answer whether cities may be acting as refuges which could presumably slow population declines. Our findings will highlight how northern urbanization may be influencing at-risk songbird species and support policy and city planning decisions, as Arctic environments are predicted to become more developed.

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It's getting hot in here, so take off on your chicks: Is snow bunting parental care affected by a rapidly warming climate?

Elena Tranze-Drabinia, MSc student at UWindsor

The Arctic is warming at accelerated rates compared to the global average, allowing for the exploitation of previously inaccessible natural resources that trigger urban development. The result is a positive feedback loop via urban heat island (UHI) effects, elevating temperatures in the city core, an unstudied phenomenon in the Canadian Arctic particularly from an ecological perspective. To fill this gap, I will investigate the combined effect of climate change and urbanization on snow buntings in Iqaluit, which has recently reached maximum summer temperatures of 20°C. Captive studies suggest active buntings begin to overheat at low ambient temperatures 9-12°C, however, free-living active birds may use behavioural flexibility to mitigate the negative effects of high body temperature. Snow buntings breed in high densities in Iqaluit compared to the rest of their circumpolar range, putting them at the forefront of UHI effects, with the city either acting as a thermal refuge from the tundra, or an ecological trap.

The goal of my research is to quantify how Iqaluit snow buntings are affected by climate- and urban-induced heat stress, what behavioural and physiological mechanisms they use to mitigate that

stress, and how those responses impact breeding success. I will examine the flexibility in provisioning rates across a thermal gradient, and whether some individuals manage rising temperatures better than others. I will also be using offspring quality and quantity as a proxy to determine whether high temperatures and other anthropogenic factors may be positively or negatively affecting snow bunting reproductive success.

I am joining the Iqaluit Snow Bunting team, and this past season we deployed equipment at 60 nests with an equal distribution between high, medium, and low urban pressures for my project. We implanted birds with a Radio-Frequency Identification (RFID) tag subcutaneously between the scapulars and set up the antennas at the entrance of nests, allowing us to record detailed provisioning rates and body temperature at every nest visit. We also placed temperature loggers within nest cavities to collect ambient nest temperatures. We also deployed temperature loggers placed inside 3D printed snow buntings to collect operative temperature , which provides a more accurate measurement of temperature as felt by the buntings. We measured, weighed and banded all nestlings at 7-11 days of age to extrapolate breeding success and fledgling quality. This novel research investigates how wildlife responds to the ecological effects of rapid environmental change in the Canadian Arctic and can hopefully act as a framework of how to coexist with urban wildlife in developing Arctic communities.

Continuing research from graduate students at UQAR and UWindsor

Fox-Proof Nests?
Challenges and Discoveries in the High Arctic
Emmanuelle Gouin, MSc student at UQAR

In the preceding newsletter, I presented an overview of my proposed master's project. This communication will now address the progress and findings of the second year of the research.

In May 2024, the team was back in Alert, Nunavut, for a second field season of four months. Eager to continue our research, our objective was to study the effects of rising temperatures in the high Arctic on the thermoregulation and reproductive performance of snow buntings. We began capturing birds as soon as we arrived in the field, when they were in their pre-breeding period. To our great surprise, we recaptured eight birds banded in 2023, including four breeding adults. Of these, two mated in 2024 and raised six beautiful chicks, whom we followed until they fledged. We also tracked a breeding female from 2023 who occupied the same breeding territory for a second consecutive year. The breeding season got off to a flying start with 21 bunting nests found by the team between 8 and 24 June.

However, working in the Arctic means having to deal with constant variations in habitat, such as annual fluctuations in food resources and predators. Unfortunately for both the project and the birds, we observed significantly higher numbers of Arctic foxes

in 2024 compared with the previous year. In addition, ermines, which were already a problem in 2023, continued to cause trouble in 2024. Thus, these two fearsome predators managed to attack 93% of the buntings' nests found in their natural habitat.

Fortunately, some very ingenious buntings were creative in their choice of nesting sites, managing to escape predation. In fact, 41% of the nests discovered by the team were located in human facilities, most of them inaccessible to four-legged predators. These small songbirds therefore obliged us to innovate in order to monitor them, as some of these nests were located in buildings several metres above ground.

Thanks to our close collaboration with the Alert community, particularly through the collection of observations and weekly presentations, we were able to work with members of the station, including military firefighters and civilian contractors, to complete the monitoring of the nests. With their precious help, we were able to collect all the necessary data, up until the fledging of the chicks. Finally, thanks to the team's perseverance, we managed to find nests right up to the end of the breeding season, with a total of 29 nests found and 30 breeding chicks captured.

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The end of a wonderful chapter

Marianne Turcotte, MSc, UQAR

My chapter as a master's student in Université du Québec à Rimouski (UQAR) just finished this very January with the deposition of my thesis. During the last two years, supervised by François Vézina and co-supervised by Oliver Love, I studied the physiological costs associated with wintering sites in snow buntings.

My study showed that while buntings wintering further north (*i. e.* closer to breeding grounds) might have a potential advantage on their fitness, due to reduced migration distances, but they might pay a high cost to do so. Indeed, the data revealed that buntings which winter in northern regions (Rimouski area) carried higher lipid reserves, were heavier, possessed more metabolically active tissue (lean tissue), and had thicker pectoralis muscles, resulting in higher physiological maintenance costs compared to those wintering in southern regions (southern Quebec and Ontario). Upon these findings, we wrote a scientific article titled Wintering closer to breeding

grounds comes at a cost in an Arctic-specialized songbird submitted to the journal Ornithology last September where it is currently under review.

While my journey as a master's student is over, I am eager to see what's in the books for me in the years to come. The dream would be to continue working with birds, especially species at risk, and to stay close to the research world. And who knows, maybe I'll be banding snow buntings in my spare time and contributing to this beautiful banding network!

I would like to thank again the wonderful banders who helped me gather precious data during my fieldwork. Thank you, Rick Ludkin, Nancy Furber, David Lamble, Patrice Bourgault and Rodger Titman, for your help. Thanks also to François Vézina and Oliver Love along with their amazing lab members with whom it's been a real pleasure sharing the last two years.

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What's on the menu ?
Inès Fache , PhD student at UQAR

Nowadays, it has been established that agricultural expansion and landscape modification have a major impact on birds' well-being. Even though most studies focus on the breeding period, it's still true that changes in farming play an important role on overwintering birds' survival. And it's exactly what's happening with snow buntings that we can find, with any luck, in our backyards and open fields, that serves as their pantry for the winter. As we know next to nothing about their winter diet, my last experiments were looking to determine what we can find in their lunchbox. Using crops' seeds, I studied, here in Rimouski, the diet preferences of the Quebecker snow bunting. On the menu, we had: oat, wheat, rapeseed, corn, barley and soy. Corn and rapeseed were preferred by far, but soy failed to please the buntings, for the happiness of the horned larks enjoying the buffet!

To understand this difference in preferences, I investigated the quantity of energy found in the crops' seeds. More precisely, I want to know what's the exact quantity of energy consumed by the birds, depending on the kind of seed they decided to eat. First, I have to measure the calories (a proxy for the quantity of energy) found in one kind of seed, and secondly, I have to measure the calories found in the


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feces of the birds which ate the same kind of seed. Then, thanks to this information, I can calculate the calories that were consumed by our birds, and with it evaluate their digestive efficiency! The sample are currently being analysed, but as for now, oat alone doesn't seem to be a very effective seed for the snow bunting. As an example, the birds have eaten similar quantity of oat and rapeseed, but observations show that both seeds had different impact on the birds' condition. The rapeseed, which contains more calories and fat, allowed the birds to maintain a stable weight, which the oat was not able to…

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Simplifying the measurement of energy reserves in snow buntings: a small equation to replace a big machine?
Baptiste Courtin, PhD student at UQAR

Snow buntings, like most migratory birds, accumulate large fat reserves to meet the enormous energy demands of their migratory flights. This is why these little balls of feathers become little balls of fat when spring arrives and the snow melts. These reserves play a key role in their migration to their Arctic breeding grounds. It is essential to measure this fat mass toin order to study its use and its impacts on the species' ecology. In the past, the method used was physico-chemical: simple, effective, but cruel. The bird was crushed and its fat separated and then weighed. This method was impractical for tracking the evolution of fat reserves over time. Fortunately for buntings, technology has evolved: quantitative magnetic resonance machines (QMR for short) now allow fat mass to be measured quickly, without excessive stress as the birds simply sit in a plastic tube for a few minutes before being released. However, these machines are rare, as they are expensive and complex to use in the field.

To address this, it is now possible, thanks to computer science and mathematical models, to estimate fat mass from age, sex, and simple morphological measurements commonly collected during bird banding. However, it is necessary to find a "key," an equation that links fat mass to these data. At first glance, the task seems simple: measure the morphological variables and fat mass using QMR on as many birds as possible (the more birds, the more accurate the results) and then use mathematical models to find the equation that links these variables to fat mass. Once the equation is found, it will allow fat mass estimation for all birds whose morphological data is available in the North American bird banding program archives (more than 33 000 individuals over 15 years). It is for this purpose that I measured snow buntings around Rimouski during the last two winters (more than 149 individuals in 2024), braving snowstorms and hungry shrikes, which will not stop me from continuing these measurements for a third winter, starting in the coming days.

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Buntings, Bands, and Big Discoveries: Our 2024 Field Season in Iqaluit

Patricia Rokitnicki, PhD student at Uwindsor

During the 2024 snow bunting field season in Iqaluit, we focused our efforts on both community engagement and research. Throughout the field season, we offered engagement opportunities to Iqaluit residents by organizing weekly walks to build relationships with community members and share information about our research. We also launched the Facebook page "Iqaluit ᖁᐅᓪᓗᖅᑕᖅ (Qaulluqtaaq) - Snow Bunting Project" to keep the community updated on our work. With the help of Iqaluit residents, we found 101 snow bunting nests and several nests for other species, such as northern wheatears, redpolls, American pipits, lapland longspurs and white-throated sparrows.

Our season started in early June with cold and wet conditions with snow still on the ground at the end of May. Snow buntings were actively searching for nesting sites in natural rock cavities and anthropogenic structures across the city. Our team spent countless hours searching for nests, recording nesting behaviours and banding snow buntings.

Over the season, we banded 55 adult snow buntings and 170 nestlings. Among these birds, we had several exciting recaptures from previous years in Iqaluit and from the South! We recovered one geolocator from a bird tagged in 2023 and recaptured several snow buntings banded in 2022 and 2023 in Iqaluit. We also caught a female snow bunting banded in January

2024 at the Haldimand Bird Observatory in Cayuga, Ontario. These findings provide important information about the return rates and connectivity of snow buntings nesting in Iqaluit.


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Perhaps the most exciting finding for our Iqaluit 2024 field season was the first record of double brooding for snow buntings in the Canadian Arctic. Our team found two female snow buntings in Iqaluit who successfully fledged their first broods, initiated second clutches and hatched or fledged nestlings from their second nesting attempts. This finding highlights potential changes in snow bunting's life history traits, which could be driven by warmer temperatures, earlier snowmelt, and increased invertebrate availability in urban Arctic areas like Iqaluit. For more details on this exciting discovery, stay tuned for our paper recently submitted to the journal Arctic, named Double Duty: First Record of Double Brooding in Snow Buntings in the Canadian Arctic.


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We wrapped up the 2024 field season at the end of July, reflecting on its successes and looking forward to the 2025 season. We are excited to continue our research, strengthen connections with the community, and continue exploring how snow buntings are responding to urban environments.


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We would like to highlight the fact that **Rebecca Jardine**, **Alysha Riquier**, **Samuelle Simard-Provencal** and **Marianne Turcotte** have completed their master's degrees. Congratulations! Your hard work and dedication have paid off, and we wish you all the best in your future endeavors.

May this next chapter be full of accomplishments and exciting opportunities!

The Snow Bunting Report

CANADIAN SNOW BUNTING NETWORK 2024

Thank you to our supporters and best of luck in the new year!

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