PICOIDES

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A newly hatched Short-billed Dowitcher (*Limnodromus griseus*) chick. // Un oisillon Bécassin roux nouvellement éclos. Photo: Mark Duchene.

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Editors' Message

Rob Warnock and Barbara Bleho

Welcome to the first issue of *Picoides* in 2026. We hope everyone had a wonderful holiday season and start to 2026. In Daneille Ethier's latest President's Message, she encourages everyone to renew their SCO-SOC membership. She also briefly discusses the new SCO-SOC Student Committee, the growth of the mentor-mentee program and the SCO-SOC website updates and refresh. Danielle notes the need for volunteers for the upcoming virtual and free SCO-SOC conference in October 2026. The new Student Committee is to increase awareness of the Society among undergraduate and graduate students, create meaningful professional development opportunities, and foster connections across institutions. We also encourage membership renewals and participation in the SCO-SOC mentor-mentee program, the SCO-SOC virtual conference (please see the poster on page 15) and the upcoming Student Committee activities.

In this issue, there is a solid set of Student Research Award Reports from Sarah Chiasson, Maya Wade, Sunny Tseng, Aalia Khan, and Laurianne Richard. A report on the 2024 University of Toronto Field Research in Ecology & Evolution Diversified (FREED) event and an article on student-led conservation of the American Kestrel in the Quebec City area are also in this issue. Other articles in this issue include a Science in Action article from Birds Canada and a brief article on The Roost, an online discussion forum for all things ornithology in Canada. In addition, there are a thesis abstract from Annika Wilcox, artwork from Olivia Maillet, a review of the online *Saskatchewan Breeding Bird Atlas, and* the latest *Avian Conservation and Ecology* Table of Contents is included in the issue. Check out all these items in this issue.

Without the five student research award reports, we would have seen a reduced number of submissions for this issue. More submissions make *Picoides* more useful and interesting for you, the SCO-SOC members. We need your help in increasing and maintaining momentum for *Picoides*. The next *Picoides* deadline is May 15, 2026. We look forward to your next submission to keep the momentum going, especially from students and bird labs. Without submissions, there is no *Picoides*. We also welcome your feedback as it is your publication, and we wish everyone a safe transition to spring.

FRANÇAIS—Message des éditeurs – Rob Warnock et Barbara Bleho

Bienvenue dans le premier numéro de *Picoides* de 2026. Nous espérons que vous avez tous passé de merveilleuses fêtes de fin d'année et que vous avez bien commencé 2026. Dans son dernier message, la présidente Daneille Ethier encourage tout le monde à renouveler son adhésion à la SCO-SOC. Elle évoque également brièvement le nouveau comité étudiant de la SCO-SOC, le développement du programme de mentorat et les mises à jour et actualisations du site web de la SCO-SOC. Danielle souligne le besoin de bénévoles pour la prochaine conférence virtuelle et gratuite de la SCO-SOC en octobre 2026. Le nouveau comité étudiant a pour objectif de mieux faire connaître la société auprès des étudiants de premier cycle et des cycles supérieurs, de créer des opportunités de développement professionnel significatives et de favoriser les liens entre les établissements. Nous encourageons également le renouvellement des adhésions et la participation au programme de mentorat de la SCO-SOC, à la conférence virtuelle de la SCO-SOC (voir l'affiche à la page 15) et aux activités à venir du comité étudiant.

Dans ce numéro, vous trouverez une série de rapports sur les bourses de recherche pour étudiants rédigés par Sarah Chiasson, Maya Wade, Sunny Tseng, Aalia Khan et Laurianne Richard. Un rapport sur l'événement de l'Université de Toronto en 2024 intitulé « Field Research in Ecology & Evolution Diversified » (FREED) et un article sur la conservation de la crécerelle d'Amérique dans la région de Québec, menée par des étudiants, sont également inclus dans ce numéro. Parmi les autres articles de ce numéro, citons un article de Birds Canada intitulé « Science in Action » et un court article sur The Roost, un forum de discussion en ligne consacré à tout ce qui touche à l'observation des oiseaux au Canada. En outre, ce numéro contient un résumé de thèse d'Annika Wilcox, des illustrations d'Olivia Maillet, une critique de l'Atlas des oiseaux nicheurs de la Saskatchewan en ligne et le dernier résumé de Avian Conservation and Ecology. Découvrez tous ces articles dans ce numéro.

Sans les cinq rapports de bourse de recherche pour étudiants, nous aurions eu moins de contributions pour ce numéro. Plus il y a de contributions, plus *Picoides* est utile et intéressant pour vous, les membres de la SCO-SOC. Nous avons besoin de votre aide pour renforcer et maintenir la dynamique de *Picoides*. La prochaine date limite pour *Picoides* est le 15 mai 2026. Nous attendons avec impatience vos prochaines soumissions afin de maintenir l'élan, en particulier celles des étudiants et des laboratoires d'ornithologie. Sans soumissions, il n'y a pas de *Picoides*. Nous apprécions également vos commentaires, car il s'agit de votre publication, et nous souhaitons à tous une transition en toute sécurité vers le printemps.

President's Message

Danielle Ethier

Winter is quickly coming to an end, and spring migration is just around the corner. I am personally looking forward to hearing my first Red-winged Blackbird, which always marks the turning of the seasons in southern Ontario.

Save the date for our annual conference, which will take place virtually this year from October 5–7. By hosting the conference online, we will open the doors to a broad, diverse community of participants from across the globe! Details on submitting workshops, symposia, and abstracts will be shared soon here: https://sco-soc.github.io/Virtual2026/en/index.html. If you are interested in volunteering to help plan the event, please sign up here: https://docs.google.com/spreadsheets/d/1tzSmrYgxh8bmkinN1UfFBcZ2-ehtaeQ47GFvXt_1b6I/edit?usp=sharing.

It's time to renew your membership! Memberships are a great way to stay connected with the Society, and they give you access and discounts to activities we run — including free access to this year's virtual conference. You can follow the link or scan the QR code to renew: https://www.zeffy.com/en-CA/ticketing/1d8439b2-5cea-4886-a00a-3fa734fa8610

Several of our committees have been hard at work over the winter months, and I am proud of their accomplishments. Our website has been undergoing updates to keep content fresh and relevant for our members: www.sco-soc.ca. Our mentor–mentee program is the largest yet, with 32 participants! We have also formed a *new* Student Committee that aims to increase awareness of the Society among undergraduate and graduate students, create meaningful professional development opportunities, and foster connections across institutions. Thank you to everyone who has been involved in these efforts!

Danielle Ethier, PhD
President | Society of Canadian Ornithologists
Senior Scientist | Birds Canada
president@sco-soc.ca

FRANÇAIS— Message de la présidente – Danielle Ethier

L'hiver tire déjà à sa fin, et la migration printanière approche à grands pas. J'ai bien hâte d'entendre mon premier Carouge à épaulettes, qui marque toujours le changement de saison dans le sud de l'Ontario.

Réservez la date pour notre conférence annuelle, qui se tiendra virtuellement du 5 au 7 octobre cette année. En organisant la conférence en ligne, nous ouvrirons nos portes à une communauté diversifiée de participants provenant des quatre coins du monde! Les détails concernant la soumission d'ateliers, de symposiums et de résumés scientifiques seront bientôt disponibles ici: https://sco-soc.github.io/Virtual2026/en/index.html. Si vous souhaitez faire du bénévolat pour aider à la planification de l'événement, veuillez-vous inscrire ici: https://docs.google.com/spreadsheets/d/1tzSmrYgxh8bmkinN1UfFBcZ2-ehtaeQ47GFvXt_1b6I/edit?usp=sharing.

C'est le moment de renouveler votre adhésion! L'adhésion est une excellente façon de demeurer en contact avec la Société, tout en profitant d'un accès privilégié et de rabais pour nos activités — y compris l'accès gratuit à la conférence virtuelle de cette année. Vous pouvez suivre le lien ci-dessous ou scanner le code QR pour renouveler: https://www.zeffy.com/en-CA/ticketing/1d8439b2-5cea-4886-a00a-3fa734fa8610

Plusieurs de nos comités ont travaillé d'arrache-pied au cours des derniers mois, et je suis fière de leurs accomplissements. Notre site Web a été mis à jour afin d'offrir du contenu pertinent et actuel pour nos membres: www.sco-soc.ca/fr. Notre programme de mentorat est plus populaire que jamais, avec 32 participants! Nous avons également formé un *nouveau* comité étudiant, dont l'objectif est d'accroître la visibilité de la Société auprès des étudiantes et étudiants de premier, deuxième et troisième cycle, de créer des occasions significatives de développement professionnel et de favoriser les liens entre les établissements. Merci à toutes les personnes qui ont contribué à ces efforts!

Danielle Ethier, PhD
Présidente | Société canadienne d'ornithologie
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Follow SCO on social media for news, exciting research, updates from members, and more!
Suivez SOC pour les nouvelles, la recherche passionnante, mises à jour des membres, et plus encore!

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SCO-SOC Taverner Award Student Report

Sunny Tseng, PhD candidate in University of Northern British Columbia
Project Title: From Recordings to Ecology: Turning Bird Sounds into Ecological Insights

When machine learning meets ornithology

"What does your Merlin say?" It's a question many of us now hear regularly in the field. Machine learning tools are now widely used to help find and identify birds by their sounds, transforming how we observe and study avian communities. Identifying birds acoustically has long been one of the most efficient ways to detect species in the field, especially when visual observation is difficult, such as at night, in dense foliage, or over long distances. In recent decades, researchers have increasingly relied on autonomous recording units (ARUs), programmable devices that record sound on a predefined schedule, to sample bird vocalizations and monitor biodiversity remotely. ARUs have revolutionized ornithology by enabling data collection across spatial and temporal scales that are impossible to achieve with human observers, while also reducing observer bias. However, this convenience comes with a major challenge: how do we translate vast amounts of audio recordings into reliable and ecologically meaningful detections?

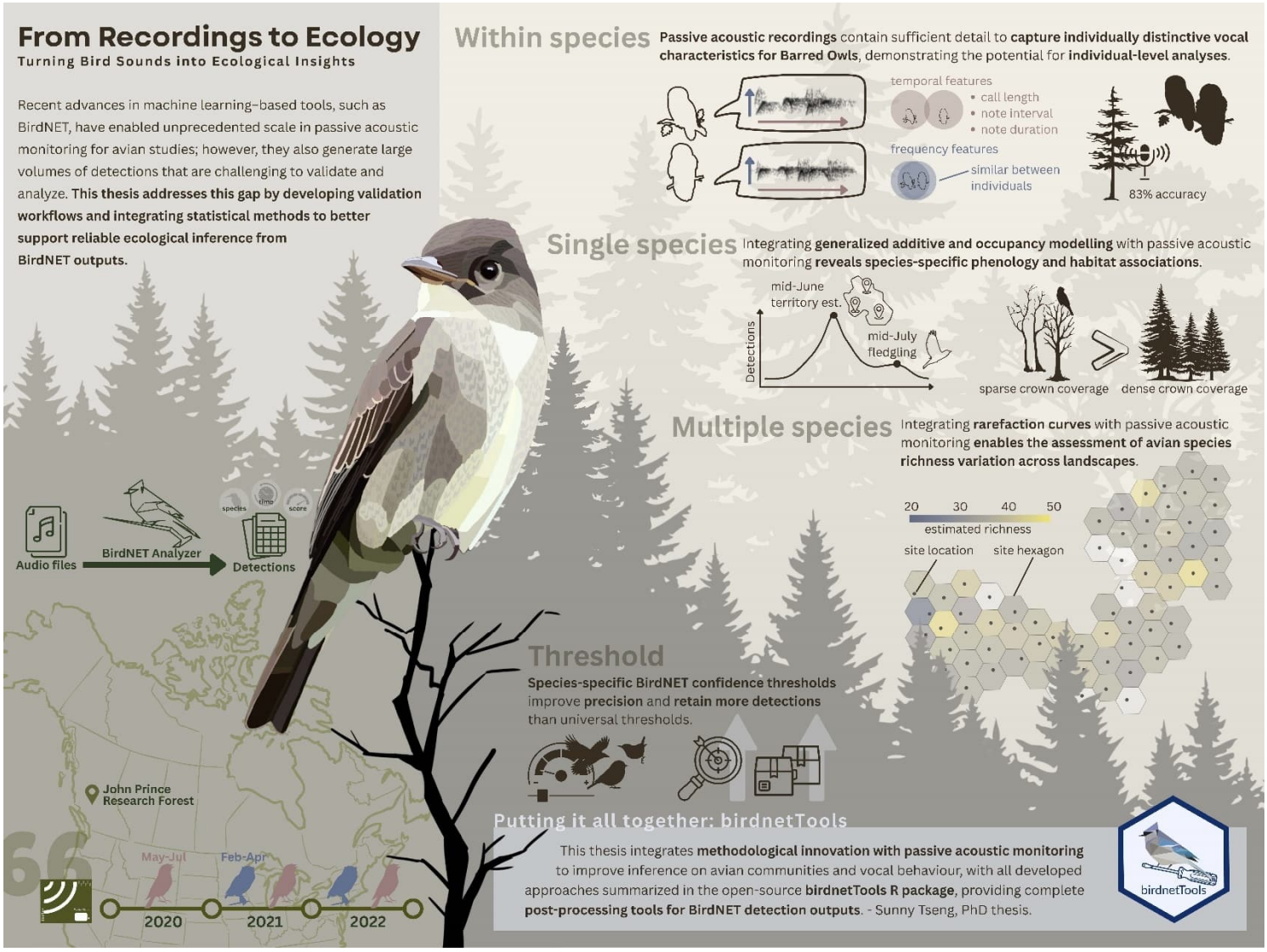
An autonomous recording unit (ARU), which can be programmed to record on a predefined schedule (e.g., time of day). Photo by Gintas Janulis.

A machine learning tool developed for bioacoustic ecologists

One of the most widely used tools for automated bird sound identification today is BirdNET. First released in 2021, BirdNET is a machine-learning algorithm based on convolutional neural networks that can identify more than 6,000 bird species worldwide. The training datasets came from the two largest bird sound libraries in the world: the Macaulay Library and Xeno-Canto. Importantly, BirdNET follows an open-science approach. It is freely available through multiple platforms, including a smartphone app, a web interface, and open-source code hosted on GitHub. The development team has also released Python and R packages, as well as graphical user interfaces, lowering the barrier for ecologists to adopt this technology. As a result, BirdNET has become one of the most successful examples of interdisciplinary collaboration, where advances in computer science directly address long-standing challenges in ecology. By converting raw audio recordings into species detections without requiring users to train their own models, BirdNET has enabled passive acoustic monitoring at unprecedented spatial and temporal scales.

The end of the story, or the start of a new game?

As powerful as BirdNET can be, it is far from the end of the story in bioacoustics. One of the most immediate challenges that comes with BirdNET is how to interpret its output. BirdNET can generate vast numbers of detections, with performance that differs across species, and there remains no standardized workflow for converting these outputs into reliable ecological inference. This challenge became the starting point for my PhD research. While I was inspired by BirdNET's transformative impact on bioacoustics, I also recognized the need to tame this powerful tool, its strengths, its limitations, and the assumptions behind its predictions, so that we are not overwhelmed by the promise of machine learning. In my PhD, I address this gap by developing validation workflows for BirdNET outputs and integrating statistical approaches that support more reliable and transparent ecological inference from passive acoustic data.



A graphical abstract summarizing my PhD research, including the development of workflows for validating BirdNET outputs and the integration of statistical methods with acoustic detections for ecological inference. Infographic designed by Sunny Tseng.

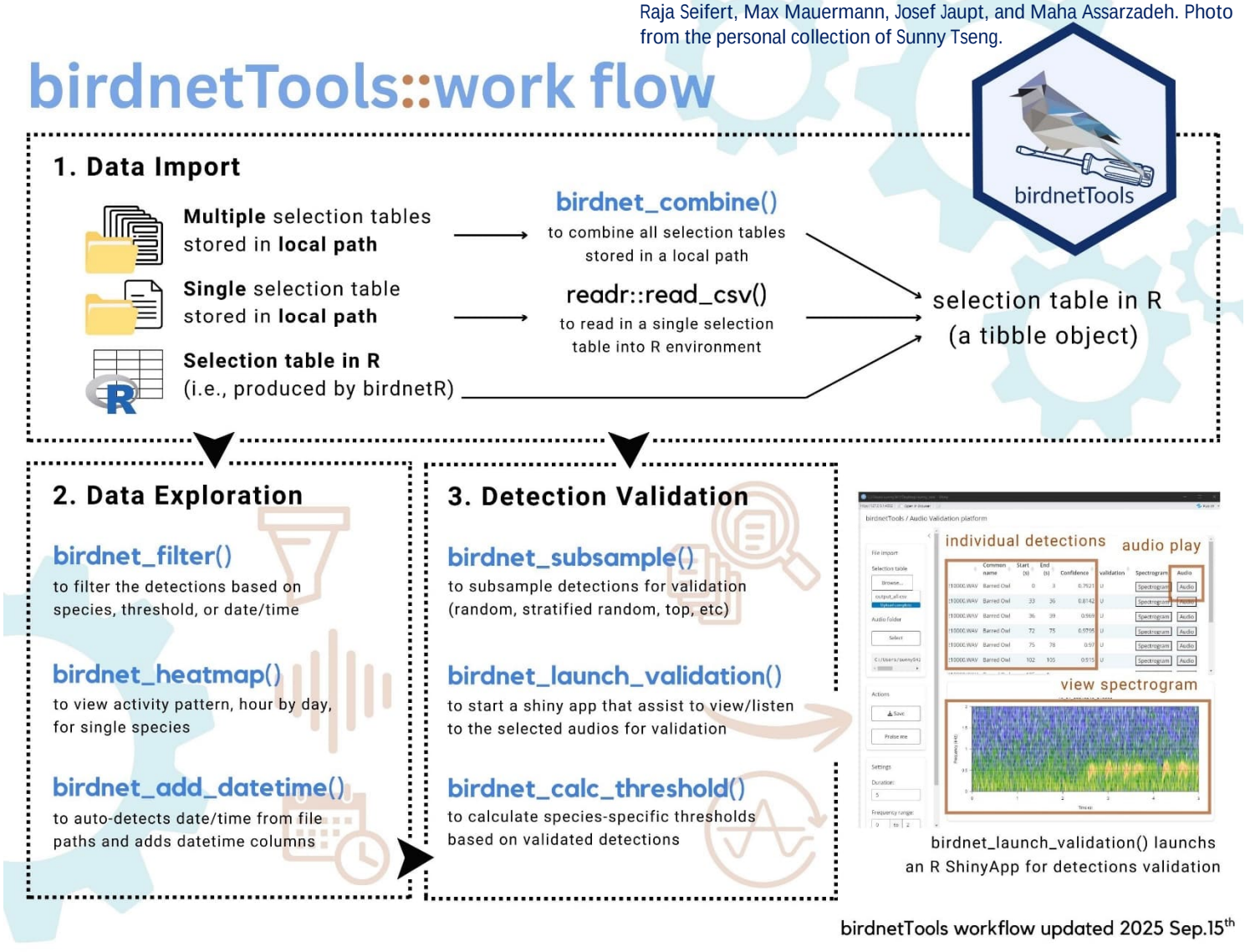
My journey with BirdNET and bioacoustics

Using three years of passive acoustic monitoring data collected in the John Prince Research Forest in BC, Canada, I evaluated the performance of BirdNET and demonstrated how its outputs can be applied to ecological questions across multiple scales. First, I developed a workflow for setting species-specific confidence thresholds for BirdNET detections. I showed that species-specific thresholds can increase precision, the proportion of true positives among predicted detections, while retaining more usable detections, thereby improving data quality without unnecessary data loss. Building on this framework, I then demonstrated the feasibility of using passively collected audios to identify individual Barred Owls (*Strix varia*), highlighting the potential for passive acoustics to support individual-level analyses in nocturnal species. Next, I integrated generalized additive models and occupancy modelling with acoustic detections to quantify seasonal vocal activity patterns and examine habitat associations for a case-study species, the Olive-sided Flycatcher (*Contopus cooperi*). Finally, I integrated passive acoustic monitoring data to assess breeding bird richness across a landscape scale. Together, this thesis demonstrates that passive acoustic monitoring, when paired with automated identification tools and careful validation, can move beyond simple presence–absence inference to address a wide range of ecological and management-relevant questions.

The strength of open science

As a scientist who strongly supports open science, I see the next stage of my PhD work as consolidating these methodological advances and making them more accessible to the research community. In 2025, I visited the BirdNET team in Germany and spent the summer working with them to develop an R package, *birdnetTools*, which brings together the methods I developed throughout my PhD. The *birdnetTools* package supports data import, visualization, and manipulation, enabling users to validate detection confidence values in a transparent and study-specific way. By lowering technical barriers, the package improves the accessibility, reproducibility, and transparency of BirdNET-based workflows for bioacoustic research. *birdnetTools* is fully open access and freely available on GitHub (https://github.com/birdnet-team/birdnetTools).

A summer working with the BirdNET team in Chemnitz, Germany, inspired the development of the R package birdnetTools. Stefan Kahl (far right) is the creator of BirdNET. From right to left: Sunny Tseng (second to right), Raja Seifert, Max Mauermann, Josef Jaupt, and Maha Assarzadeh. Photo from the personal collection of Sunny Tseng.



The *birdnetTools* cheatsheet, highlighting key R functions that support validation, visualization, and data wrangling of BirdNET outputs. Infographic designed by Sunny Tseng.

Notes

Parts of my PhD thesis have been published as peer-reviewed articles, including *"Setting BirdNET confidence thresholds: species-specific vs. universal approaches"* and *"Using autonomous recording units for vocal individuality: insights from Barred Owl identification."* My PhD research was partially supported by the Taverner Awards from the SCO–SOC. I am deeply grateful to the Society for providing meaningful opportunities for students and early-career researchers to grow, collaborate, and contribute to the ornithological community. I am committed to giving back and supporting the next generation of researchers in the field.

Sarah Chiasson, BSc with Honours in Environmental Science, Saint Mary's University
Project Title: Do female starlings who engage in intraspecific brood parasitism also raise concurrent broods?

Intraspecific brood parasitism (IBP), a reproductive strategy whereby a female bird lays an egg in the nest of a conspecific, has long been documented in European Starlings (*Sturnus vulgaris*). While past studies have shown that European Starlings engage in IBP due to nest disturbances and low nest site availability, the question of whether they engage in IBP while having concurrent broods has so far been unexplored. My Honours project therefore aimed at answering this question, as well as looking at the body condition of female parasites and their hosts to investigate whether body condition plays a role in host selection.

European Starling exiting its nest box. Photo: Cameron Brown.

From May to July, in both 2024 and 2025, I collected data from the nest box breeding population of European Starlings located on the campus of Saint Mary's University, Halifax, NS. This data included blood samples collected from 89 adults that were caught and banded with CWS and colour bands, as well as blood samples from 208 nestlings that were also banded with a CWS band. All caught adults also had their mass and tarsus length measured to eventually calculate body condition.

Following the 2025 field season, I extracted the DNA from all the collected blood samples and determined the concentration and purity of each DNA sample. I am now in the process of optimizing multiplex reactions to genotype all adults and nestlings using eight polymorphic microsatellites.

Preliminary findings show that some female starlings in the study population have engaged in IBP while raising a concurrent brood. As this project continues, I will determine the frequency of IBP within the study population during the 2024 and 2025 breeding seasons, calculate the body condition of the adult starlings, and determine whether body condition had a significant impact on host selection for IBP.

I would like to express deep gratitude to the SCO-SOC for the financial support they have provided, allowing me to purchase the primers I require for genotyping.

STUDENT CONTRIBUTIONS WANTED FOR PICOIDES

SCO-SOC encourages students to submit material for *Picoides*. In particular, we would like each issue to feature abstracts of at least one or two recently published theses. They must be from students at a Canadian university, but need not necessarily focus on Canadian birds. Abstracts should be 250-400 words long, preferably accompanied by one or two relevant photos.

We also welcome articles describing aspects of student research in greater detail; these should focus on a subject relevant to Canadian ornithology, require references, and may be up to 1,000 words long, again preferably accompanied by one or two photos. See the SCO-SOC Information page for submission details.

SCO-SOC Fred Cooke Award Student Report

Laurianne Richard, MSc, Institut National de la Recherche Scientifique

Project Title: Embryotoxicity of PFAS in Northern gannets (*Morus bassanus*): An egg-injection study

Laurianne collecting Northern gannets' eggs at Île Bonaventure. Photo: Anaïs Kerric.

During egg formation, female seabirds transfer a wide range of biomolecules to their embryos to support proper development. Per- and polyfluoroalkyl substances (PFAS), well-known persistent pollutants with a strong affinity for both lipids and proteins, can also be transferred to eggs, thereby exposing embryos to these contaminants. Although PFAS toxicity in avian embryos has been documented, the underlying molecular mechanisms of action remain poorly understood. Therefore, the objective of the second experimental chapter of my PhD is to assess PFAS embryotoxicity in Northern Gannet embryos (*Morus bassanus*), a species known to accumulate high concentrations of persistent contaminants, using an egg-injection approach combined with the assessment of physiological and molecular endpoints.

To achieve this objective, we travelled to Île Bonaventure (Gulf of St. Lawrence, Québec, Canada), which hosts the largest Northern Gannet colony in North America, in May 2025. We collected 100 freshly laid eggs and transported them to the laboratory, where they were randomly assigned to ten treatments: non-injected punctured controls, vehicle (DMSO) controls, and two concentrations of the well-characterized compound PFOS (C8), as well as three additional PFAS selected based on their carbon chain length and environmental relevance: PFHxA (C6), PFOA (C8), and PFDoDA (C12). Following injection, all eggs were artificially incubated for 14 days, corresponding to approximately one third of the full incubation period for this species. Eggs were then opened to assess embryonic survival and development, and tissues including brain, heart, and liver were sampled for subsequent gene expression analyses.

At this stage, only preliminary results are available. Overall, 76% of the collected eggs were fertilized, and among these, 67% survived throughout the artificial incubation period. Based solely on survival and gross developmental assessments, we did not observe significant differences in embryo condition among PFAS treatments. However, embryos exposed to PFHxA and PFOA tended to show a higher proportion of underdeveloped individuals, potentially suggesting growth-related effects of these compounds. In addition, we did not observe a clear dose-dependent effect on mortality, except for PFHxA, which showed a significantly reduced survival rate at the higher exposure concentration.

Several steps remain to further investigate these trends. We will primarily assess PFAS-induced changes in gene expression through RNA extraction followed by RT-qPCR analyses in the sampled tissues. Genes of interest include those related to oxidative stress, thyroid and stress hormone signaling, immune function, and xenobiotic metabolism. We will also evaluate embryonic morphology and assess heart rate using photographs and videos collected during sampling. Finally, we will quantify PFAS distribution within eggs through chemical analyses of the yolk, albumen, inner shell membrane, and embryonic carcass. Together, these complementary analyses will allow us to better understand how PFAS affect avian embryonic physiology from the molecular to the morphological level, as well as how these contaminants partition among egg components during early development.

I am extremely grateful to have received the Fred Cooke Award in 2025. This project would not have been possible without the generous support of the SCO–SOC and Birds Canada, which enabled the funding of my fieldwork.

Laurianne sampling tissues of a Northern gannet embryo. Photo: Anaïs Kerric.

SCO-SOC Avian Conservation Award Student Report

Maya Wade, MSc student, UBC Faculty of Forestry & Environmental Stewardship

Project Title: Impacts of Climate-Driven Shrub Expansion on Birds in the Western Canadian Arctic

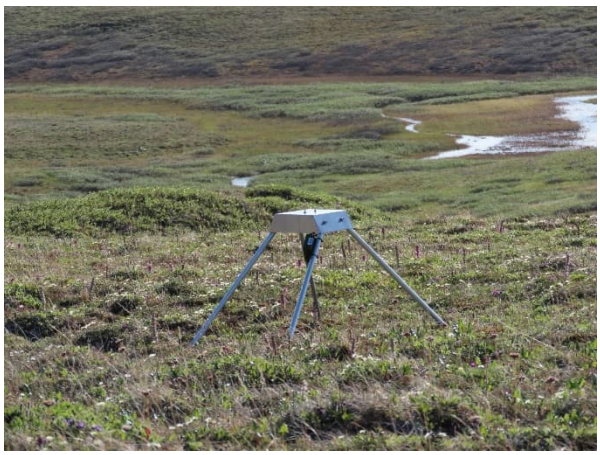


Figure 1. An autonomous recording unit deployed on Qikiqtaruk, with a large willow shrub patch growing in the background. The local muskox love to use our metal tetrapods as scratching posts. Photo by Maya Wade.

Climate change is driving the growth of tall, woody shrubs in formerly open tundra landscapes, a phenomenon known as shrub expansion. This vegetation change is rapidly reshaping habitat structure and ecosystem processes across the Arctic, with profound implications for over 200 bird species that rely on tundra ecosystems for survival and reproduction. However, the long-term ecological consequences of shrub expansion for Arctic birds remain poorly understood.

Shrub expansion could alter avian species distributions, population dynamics, and community composition through mechanisms such as increased nest predation and the loss of suitable foraging and breeding habitats for open-tundra specialists. Shifts in bird populations may disrupt trophic interactions and cause cascading ecosystem effects across species' migratory ranges. Previous research suggests that bird abundances often respond nonlinearly to shrub expansion depending on species-specific habitat preferences, but these studies are limited by short time frames that preclude detection of lagged or long-term ecological responses. Given ongoing and widespread population declines in Arctic birds, long-term research is urgently needed to inform avian management and conservation efforts.

For my MSc research, I am studying how shrub expansion affects the community composition, population dynamics, and habitat use of Arctic birds on Qikiqtaruk-Herschel Island, Yukon. My project integrates 37 years of Yukon Parks' bird surveys with bioacoustic monitoring and remotely sensed vegetation data. Specifically, my objectives are to:

1. Quantify long-term trends in avian community composition, abundance, and nesting activity (1990-2026)
2. Investigate species-specific habitat associations across shrub density gradients using bioacoustic monitoring
3. Synthesize circumpolar bird population trends and environmental niches to test whether local avian responses on Qikiqtaruk-Herschel Island are consistent across the Arctic

Qikiqtaruk-Herschel Island (hereafter Qikiqtaruk), a territorial park in the Inuvialuit Settlement Region, is a hotspot for avian wildlife, with over 120 species recorded and 46 species breeding on the island. Over the past four decades, Qikiqtaruk has undergone dramatic climate-driven environmental change, with warming temperatures facilitating rapid shrub expansion at the expense of low-lying tundra vegetation. Qikiqtaruk hosts one of the longest continuous ecological monitoring programs in the Western Canadian Arctic, including an annual breeding bird survey that has been conducted since 1990. This provides a unique opportunity to assess long-term ecological responses to environmental change in the Canadian Arctic. The Park is co-managed by Yukon Parks and the Inuvialuit, and research conducted on Qikiqtaruk directly supports Inuvialuit-led stewardship, monitoring, and conservation decision-making.

I completed my first field season on Qikiqtaruk from June to mid-July 2025, timed to coincide with the local breeding bird season. I deployed 33 autonomous recording units (Figure 1) and collected high-resolution drone imagery at each site to characterize site-level shrub cover. In collaboration with Territorial Park Rangers, I participated in Qikiqtaruk's 36th annual Yukon Parks Breeding Bird Survey and the Yukon Parks Raptor Survey, supporting the park's long-term ecological monitoring program. I conducted an additional 16 bird surveys in habitats not covered by the official bird monitoring program to ground-truth bioacoustic detections (Figure 2).

Figure 2. Scanning for bears or scanning for birds…always both! Photo by Cameron Eckert.

Preliminary analyses of Qikiqtaruk's Breeding Bird Survey data (1990-2025) suggest that the tundra bird community composition has shifted significantly since 1990, driven largely by species turnover. While species richness and diversity metrics remained relatively stable, standardized total abundance significantly decreased, suggesting within-species population declines and possible disruptions to ecological function. Shrub-associated species such as White-crowned Sparrow and Bluethroat have increased, while open-tundra-nesting species like American Golden-Plover and Lapland Longspur have decreased.

Figure 3. A young Baird's Sandpiper chick foraging. A parent was nearby, keeping watch over all three of its chicks. Photo by Maya Wade.

Environmental vector fitting identified maximum annual NDVI, a proxy for tundra land-surface greenness that reflects vegetation change such as shrub expansion, as the strongest predictor of these compositional changes. Over time, the land surface is becoming greener, concurrent with shifts in the bird community towards shrub-dependent species and away from open-tundra specialists. These results suggest that climate-driven shrub expansion is likely playing a key role in reshaping tundra bird communities, threatening the persistence of open-tundra specialist species (Figure 3). Further analyses incorporating site-level vegetation data will strengthen inferences about how shrub expansion is affecting tundra-breeding birds, and local habitat associations derived from bioacoustic monitoring will provide insight into which species are most vulnerable to continued shrub expansion.

By integrating long-term monitoring with novel bioacoustic and remotely sensed data, my research will provide insight into how shrub expansion is reshaping Arctic bird communities. These findings will directly inform Inuvialuit-led stewardship and adaptive management on Qikiqtaruk, while also contributing to broader circumpolar efforts to protect Arctic birds under rapid environmental change. I am exceptionally grateful to the Society of Canadian Ornithologists and Birds Canada for their support through the Avian Conservation Award, which has played an important role in advancing this research and supporting my development as an early-career avian ecologist.

SCO-SOC Discovery Award Student Report

Aalia Khan, MSc, Carleton University

Project Title: A Global Evidence Synthesis of Outcomes of Urban Bird Conservation Interventions

I recently completed my master's thesis with Dr. Rachel Buxton's Biodiversity Conservation Solutions Lab at Carleton University. For my thesis, I worked with coordinators of Nature Canada's Bird Friendly Cities program to understand outcomes of conservation interventions for birds in cities.

Cities contain high concentrations of threats to avian populations. The most severe threats include predation by cats, collisions with windows, disorientation by light pollution, and bird-vehicle collisions. A number of programs address bird conservation in cities, such as the American Bird Conservancy and Environment for the Americas' Bird City Network and Nature Canada's Bird Friendly Cities program. The objectives of these programs are to reduce bird mortalities in cities and build bird conservation awareness. This is done in part by promoting interventions that have been proposed to tackle some of these threats. Proposed interventions include the application of window decals to help birds avoid colliding with windows, specialized cat collars to reduce cat predation, and using downward-facing lighting designs reduce the effects of light pollution. While some of these interventions have been tested and proven to be successful, knowledge of the effectiveness of many interventions remains limited.

To improve our understanding of the effectiveness of these interventions, we conducted an evidence synthesis on the global academic literature exploring outcomes of interventions for four key threats facing urban birds: cat predation, bird-window collisions, light pollution, and bird-vehicle collisions. Specifically, we:

1. summarized the current state of the literature on urban threats and conservation interventions for birds; and
2. evaluated the outcomes of interventions aimed at reducing impacts of major urban threats on birds.

Our evidence synthesis followed, as closely as possible, the Collaboration for Environmental Evidence's (CEE) standardized guidelines for systematic maps. we separated papers into "threat-based" and "intervention-based" studies. Threat-based studies were defined as studies that established the presence, magnitude or drivers of a threat facing birds. Intervention-based studies were defined as studies that assessed the outcome of an implemented intervention on bird populations. These latter studies were assessed for the quality of their methodological approach and then findings were compared using a meta-analysis.

Our evidence synthesis retrieved a total of 522 articles, including 118 on cat predation, 93 on bird-window collisions, 221 on light pollution, and 101 on bird-vehicle collisions. Across all topics, we found that only 6.7% of papers (i.e., 35 out of 522) studied outcomes of conservation interventions, while the rest were focused on establishing the presence, magnitude, or drivers of the threat (Figure 1). While publications studying threats have greatly increased in volume over time, those exploring outcomes of interventions have not seen the same growth, remaining infrequent in urban bird research. We actually found no urban intervention-based studies on light pollution, and only two intervention-based studies for vehicle collisions, and so could not draw conclusions on the outcomes of proposed interventions for these two threats.

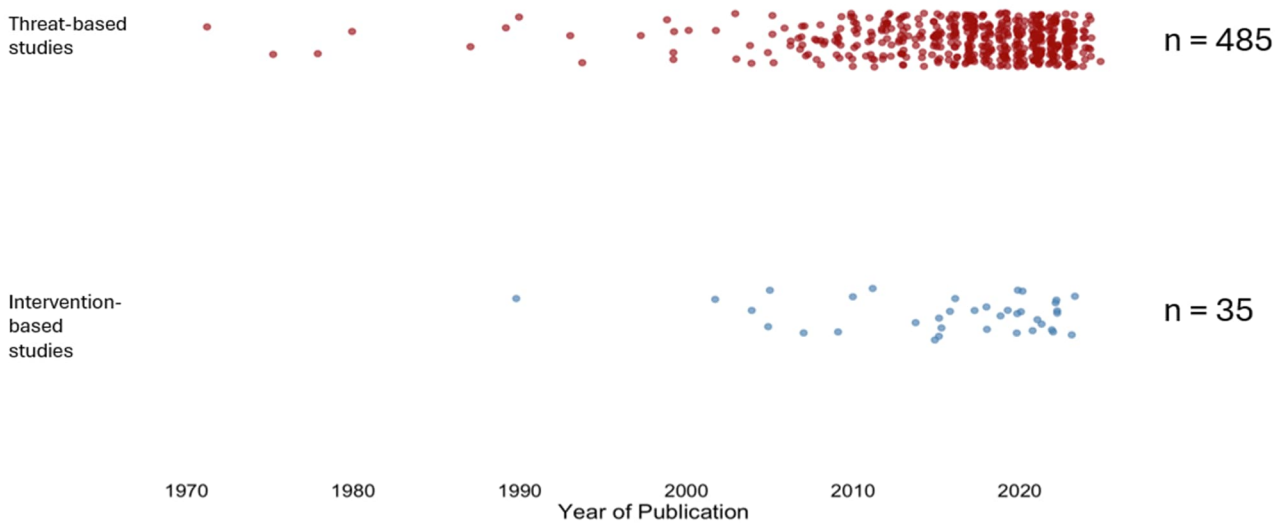


Figure 1: A jitter plot of publications over time. Studies that establish the presence, magnitude or drivers of threats facing urban birds are in red. Studies that assess outcomes of conservation interventions to address urban threats are in blue.

Of the existing intervention-based studies, 20 were focused on interventions to address window collisions, most of which were in the form of decals. Our meta-analysis found that most of the window treatments that were tested, except for bird of prey decals and other decals with low area coverage or placed on the inside of the window, effectively reduced bird-window collisions. Decals with closely spaced vertical stripes and circular or square decals were the most effective and reduced bird mortality rates by up to 98%.

Cat predation had the second greatest number of studies on interventions in urban areas (n=13). All of these studies focused on specialized collars or behavioural treatments to reduce the number of birds brought home by owned domestic cats that were let outside. Of these treatments, our meta-analysis found that the Birdsbesafe™ collar, a rainbow-colored collar designed to make the cat highly visible to birds, was the most effective in reducing the number of birds brought home (a net reduction of 54%). However, it is important to consider that cats wearing these collars still brought home some birds, whereas none would be brought home if these cats were kept indoors. A major element missing from the literature was research on the effectiveness of cat roaming bylaws as well as programs to reduce feral cat populations in reducing bird deaths in cities.

In summary, our evidence synthesis found a significant dearth of academic literature on outcomes of interventions for bird conservation in cities. Our findings from the existing literature will be used to help improve Nature Canada's Bird Friendly Certification criteria, ultimately improving bird conservation efforts in Canada's cities.

Figure 2: A cat wearing a Birdsbesafe™ collar to prevent predation on birds. Photo copyright © belongs to Birdsbesafe™.

Recent Canadian Ornithology Theses

Wilcox, Annika. 2024. Limiting Factors of Restored Agricultural Wetlands for Migratory Birds. MSc. Thesis. University of Guelph, Guelph, ON.

Wetland loss across southern Ontario has reduced critical stopover and breeding habitat for many migratory bird species, making wetland restoration a key conservation strategy in agricultural landscapes. However, we still lack a clear understanding of which factors most strongly influence how bird communities use restored wetlands. My research examined multiple potential limiting factors at restored agricultural wetlands in Norfolk County, Ontario, to identify the ecological drivers shaping bird community composition.

I quantified wetland characteristics such as age, size, and vegetation structure, as well as surrounding landscape features, including adjacent land use and the quantity of nearby water bodies. To assess food availability and habitat quality, I characterized aquatic invertebrate community composition, focusing on key taxa such as stoneflies, mayflies, and caddisflies, which are both an important avian prey source and indicators of good water quality. Bird communities were surveyed repeatedly throughout the spring and early summer through point counts and the use of autonomous recording units (ARUs) to capture patterns of species richness and abundance.

Contrary to expectations, wetland age and the number of nearby water bodies did not consistently explain observed patterns in bird communities. Instead, wetland size and landscape context emerged as dominant influences: larger wetlands and those bordered by pasture supported higher bird species richness and abundance, whereas smaller wetlands and those adjacent to urban development tended to host fewer birds. Within the wetlands themselves, sites with greater floating vegetation cover and edge vegetation, as well as a higher presence of pollution-sensitive invertebrate taxa, were used more heavily by birds, highlighting the importance of both habitat structure and invertebrate food resources.

These findings suggest that where a restored wetland is located on the landscape, and what it provides at the local scale, can be as important - if not more so - than how long it has been restored. For practitioners and land managers aiming to enhance habitat value for migratory birds, prioritizing restoration in more favourable land-use contexts and promoting in-wetland features that support important resources could improve conservation outcomes.

Above: Green Heron at Annika Wilcox's study site. Top right: Annika Wilcox doing a point count. Bottom right: Annika Wilcox performing invertebrate sampling. Photos courtesy of Annika Wilcox.

Feature Articles

2024 University of Toronto Field Research in Ecology & Evolution Diversified (FREED) Event

Jaden Tran, Student and FREED Participant

As I stepped onto the grounds of the Algonquin Wildlife Research Station, I found myself being the first student to arrive for the 2024 University of Toronto Field Research in Ecology & Evolution Diversified (FREED) event. Despite having just returned from a field course in Peru, I was eager to spend another week in the field at Algonquin Provincial Park. After gathering my daypack and meeting the FREED team, I lingered in a quiet spot outside, listening to the birdsong drifting through the trees as sunlight filtered through the forest, and the lake's fresh scent hung crisp through the cool air. Soon thereafter the other 14 students arrived - each carrying their own individual thread of interest, stories and goals that would weave together to form a tapestry of new discoveries and experiences.

Jaden holding a black-capped chickadee in the birds workshop. Photo credit: Jaden Tran.

I spent my undergraduate years researching avian ecology and aerodynamics with Dr. Santiago Claramunt's team at the University of Toronto. Working in the lab and at the Royal Ontario Museum largely kept me indoors with research papers, study skins, and data spreadsheets. Growing up, my family did not have the means for me to interact with nature outside of urban Toronto either. I eventually got the chance to perform field experiments handling migrating warblers coming through Toronto and conducting my own avian biodiversity studies in the Peruvian Amazon. I returned to Canada afterwards with a newfound excitement for the outdoors, eager to explore more of my native country through FREED. For many people, including myself, we fell in love with working in nature through valuable, hands-on experiences connecting us with the outdoors and the natural world. However, there are many barriers to individuals accessing opportunities to connect with nature and the land directly; thus, restricting chances to develop confidence, knowledge, and field skills. This is especially true for those who identify as Indigenous, Black, and/or Racialized, the demographic FREED was created to address and support.

On the first morning, I woke up before the sunrise and went out alone for a walk around the station grounds with my binoculars. With the busyness of the previous day, settling into our cabins and learning the ground rules of the research station, it was a welcome chance to sit with my own thoughts and prepare myself for the days to come. It was during this time of serenity when a Great Blue Heron flew over my head and landed in the water nearby, walking around searching for prey until it disappeared into the tall reeds. This marked the first of many amazing birds that I was able to see over the week, many of them being life listers. My favourite birds included Merlins, Black-and-white Warblers, Northern Flickers, and Ruby-throated Hummingbirds. We also saw River Otters, Snapping Turtles, Ring-necked Snakes, Blue-spotted Salamanders, and even a Moose!

FREED participants birding at Mew Lake Campground. Photo credit: Alexander Abdel.

One of the many workshops at FREED was led by Brendan Boyd, Ontario Forest Birds Program Coordinator at Birds Canada, and Alexandra Israel, Species Recovery Conservation Steward at the Toronto Zoo. They taught us the basics of bird identification, used mist nets to catch birds, showed us how to attach leg bands, and had us record morphological data. It was magical seeing students that had never held a bird before do so for the first time! Beyond the structured workshops, I am beyond grateful to the staff for being amazingly supportive of our desire to learn from the natural classroom we found ourselves in. My early morning birding was turned into an impromptu trip to the airfield in Mew Lake Campground, which grew into a full-blown group excursion as more students began to show interest!

The experiences and opportunities offered through FREED have proven to be invaluable to students looking to pursue careers relating to ecology and the environment, regardless of their current academic progress. As a graduating student with a focused career trajectory, I could take this time to hone my field ornithology research skills while having fun exploring alternative paths with little commitment. The breadth of the workshops also enabled younger students without a defined goal to freely discover their interests. It was such a delightful experience being able to spend time with the other FREED students and build lifelong relationships with them. We taught each other a great deal about our individual passions, inspiring the same enthusiasm in others. As I wrap up my undergraduate journey and we all move on to continue our paths, we know that no matter where we are in the world, we will always have this connection, leading back to that one summer week at Algonquin. Thank you, SCO-SOC, for your continued support in making FREED events possible!

Double-crested cormorant in Algonquin Provincial Park. Photo credit: Jaden Tran.

A Student-Led Initiative for the Conservation of the American Kestrel

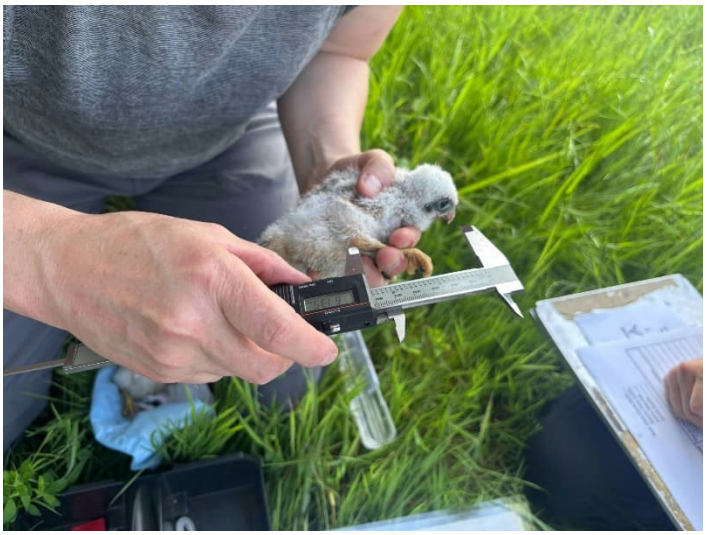
Laurie Boulerice and Marguerite Rousseau

The American Kestrel (*Falco sparverius*), the smallest falcon on our continent, uses most of North America as a breeding ground. The American Kestrel inhabits open and semi-open habitats with low ground vegetation, where it feeds primarily on insects and small rodents. According to the North American Breeding Bird Survey, American Kestrel populations have declined approximately 1.3% per year (-1.30 [-1.88; -0.72]) from 1970 to 2022 (Environment and Climate Change Canada and Birds Canada, 2024). Several hypotheses have been proposed to explain this decline, including increased predation from Cooper's Hawk (*Accipiter cooperii*), infection from pathogens such as West Nile virus, pesticide use, and habitat loss (Bird and Smallwood, 2023). As McClure et al. (2017) demonstrates, close monitoring of American kestrels is therefore essential to better understand the drivers behind these trends.

American kestrels are secondary cavity nesters and readily use nest boxes, making them an ideal species for nest box programs. One such program, the *Projet Crécerelle*, is an initiative of The Wildlife Society student committee of Laval University and aims to monitor American Kestrel populations, provide suitable nesting habitats in the Québec City region, and raise awareness about the species' conservation status.

Projet Crécerelle began in 2008, initiated by Jean-François Therrien, who installed the first network of nest boxes in the Québec City area. In 2011, Marie-Claude Martin further developed the project by contributing her expertise in bird banding, thus enabling the banding of nestlings to gather morphological and biological data. Although the project was long associated with the *Hawk Mountain Sanctuary*, an association focusing on raptor's conservation, it is now partnered with NestWatch, a Cornell Lab of Ornithology program. This allows us to submit standardized nesting data. *Projet Crécerelle* also collaborates with the *Observatoire d'oiseaux de Tadoussac* and the *McGill Bird Observatory*, which run nest box programs, as well as with the Collège Mariste de Québec, a local high school, whose students build nest boxes as part of their science curriculum.

While the nest box network remains the project's primary activity, members also organize monthly birdwatching outings, participate to the Christmas Bird Count on campus, host outreach booths and presentations in schools and non-profit organizations, to raise awareness on American kestrels. The committee is also exploring the possibility to introduce many new projects like bird-friendly coffee in a student cafeteria, as well as establishing a partnership with a professor at Université Laval to support an undergraduate introductory research project using the data collected through the program.



Baguage_crecerelle: A young American Kestrel being measured, before being banded.

Today, a total of 52 nest boxes are installed throughout the Québec City region. Each winter and spring, student volunteers monitor the network. In March, nest boxes are cleaned and prepared for the kestrels' return by removing old nesting material and replacing it with fresh substrate. Damaged boxes are also repaired or removed. Following the kestrels' arrival in May, volunteers identify occupied boxes. Throughout the breeding season, these nests are closely monitored to record laying dates, hatching success, mortality, and fledging. Nestlings are banded during this period, around June July. Last year, a pilot project tested the installation of a camera inside a successful nest box. This season, eight cameras will be deployed to gather valuable information on egg hatching date, number of eggs, precise date of fledging and possibly what the nestlings are being fed, while reducing the need for frequent visits and easing the workload of volunteers.

The project engages a large number of students. In 2025 alone, 40 students participated either in one of the three nest box monitoring rounds or in kestrel banding, and the executive committee currently includes 12 students. Since the beginning of the project, 109 kestrels have been banded. The occupancy rate, which stayed under 7.5% for the first ten years (2009-2019), kept increasing to reach 25% last year. While this increase over time could suggest population growth, it is possible that nest boxes previously used are more likely to be reused in subsequent years (Hannay et al. 2023). As such, the pattern may instead reflect the successful implementation of the nest box network. Furthermore, an increase in nest-box occupancy should be seen for nest-limited populations of kestrel up to 4-6 years after the implementation of nestbox programs (Smallwood et al. 2009). The lack of this tendency in our data might suggest that the population of kestrels around Quebec City, might not be nest-limited, although this hypothesis would need to be further tested. It is also important to recognize that some boxes have been removed when in unsuitable habitat or after years without occupancy, which can artificially inflate occupancy estimates. At present, no clear trend in productivity has been detected within the project. This contrasts with observations from Hawk Mountain Sanctuary, where a decline in American kestrel productivity in nest boxes has been reported over the past decade, although continued monitoring will be necessary to confirm whether similar patterns will emerge in the kestrels of Quebec.

Projet Crécerelle offers a good opportunity for undergraduate students at Université Laval to gain field experience beyond their coursework. Participants contribute to data management, project development, and strategic planning for the student committee. Through outreach activities, members are introduced to birding and develop their science communication skills. Ultimately, the project plays a meaningful role in training future biologists and, perhaps, inspiring the next generation of ornithologists.

Tournee_nettoyage: A volunteer climbs a ladder to clean a nest box in preparation for the return of American Kestrels.

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Information Exchange and Announcements

SCO-SOC and Birds Canada Team Up to Launch The Roost!

The Society of Canadian Ornithologists and Birds Canada have partnered to launch The Roost, an online discussion forum for all things ornithology in Canada. The Roost is free to join, and open to anyone interested in the research and conservation of Canada's birds. The Roost is a place for open discussion and collaboration. Topics include field data collection, data analysis, conservation applications, recent research, outreach, and technology platforms like NatureCounts and WildTrax. It is an ideal place to ask questions, work out ideas, and share announcements like job postings and academic opportunities.

We are working hard to make The Roost as accessible and inclusive as possible, and to build it into a rich community for ornithologists of all career levels. It is easily accessed with a free Birds Canada account — the same one used for Motus, NatureCounts, and other Birds Canada programs. To explore The Roost, visit roost.birdscanada.org. We invite you to share the community with anyone who might be interested and welcome your feedback as we strive to make it the best that it can be. See you on The Roost!

SCO-SOC et Oiseaux Canada s'associent pour lancer Le Perchoir !

Le Société des ornithologistes du Canada et Oiseaux Canada se sont associés pour lancer Le Perchoir, un forum de discussion en ligne consacré à tout ce qui touche à l'ornithologie au Canada. L'inscription à Le Perchoir est gratuite et ouverte à toute personne intéressée par la recherche et la conservation des oiseaux du Canada. Le Perchoir est un lieu de discussion et de collaboration ouvert à tous. Les sujets abordés comprennent la collecte de données sur le terrain, l'analyse des données, les applications en matière de conservation, les recherches récentes, la sensibilisation et les plateformes technologiques telles que NatureCounts et WildTrax. C'est l'endroit idéal pour poser des questions, échanger des idées et partager des annonces telles que des offres d'emploi et des opportunités académiques.

Nous travaillons d'arrache-pied pour rendre Le Perchoir aussi accessible et inclusif que possible, et pour en faire une communauté riche pour les ornithologues de tous niveaux. Il est facilement accessible avec un compte Oiseaux Canada gratuit, le même que celui utilisé pour Motus, NatureCounts et d'autres programmes de Oiseaux Canada. Pour explorer Le Perchoir, rendez-vous sur roost.birdscanada.org. Nous vous invitons à partager la

communauté avec toute personne susceptible d'être intéressée et nous vous remercions de vos commentaires, car nous nous efforçons de la rendre le meilleur possible. Rendez-vous sur Le Perchoir!

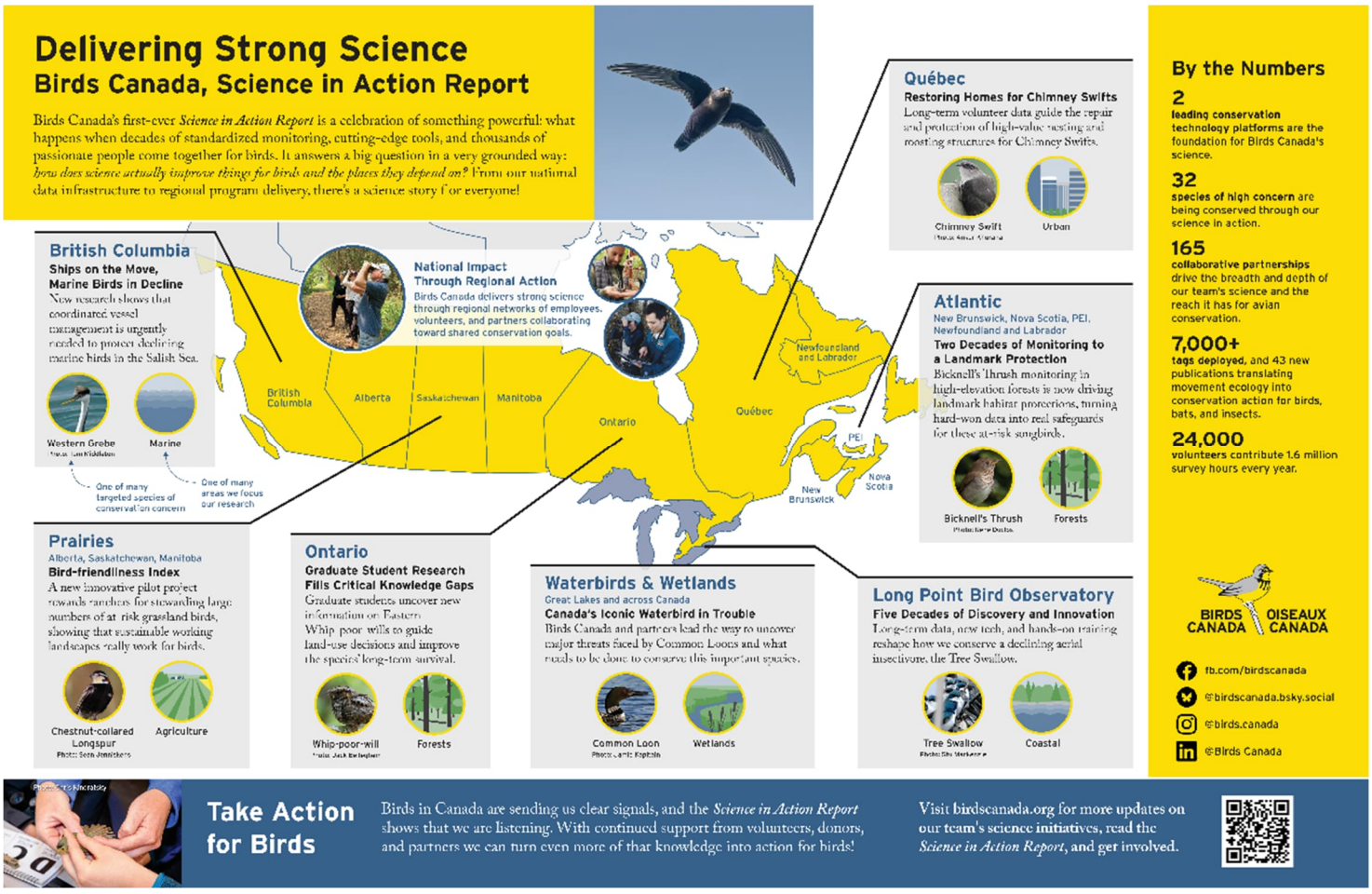
Delivering Strong Science: Birds Canada's First Science in Action Report

Danielle Ethier, Ph.D., Senior Scientist, Birds Canada

Birds Canada's first-ever Science in Action Report is a celebration of something powerful: what happens when decades of standardized monitoring, cutting-edge tools, and thousands of passionate people come together for birds. It answers a big question in a very grounded way: How does science actually improve things for birds and the places they depend on?

What is the Science in Action Report?

The Science in Action Report is a new look at how Birds Canada's science is driving conservation on the ground. The report pulls together key stories and numbers from across the country to show how data collected by more than 24,000 volunteers during 1.6 million hours in the field are being turned into better policies, restored habitats, and stronger protections for species at risk. This year's Science in Action report brings to life the stories that science is revealing, the people behind them, and the birds that we observe and count using different methods, in order to understand how we can help their populations thrive. From our national data infrastructure to regional program delivery, each section of the report answers a simple question: Over the past year, what has our science done to help birds thrive?



Produire une science robuste

Le tout premier rapport *La science en action* d'Oiseaux Canada célèbre quelque chose de puissant : c'est la célébration d'une force immense : que se passe-t-il lorsque des décennies de suivi standardisé, des outils de pointe et des milliers de passionnés se mobilisent pour la protection des oiseaux? Cela

répond de manière très concrète à une question essentielle : comment la science peut-elle réellement améliorer la situation des oiseaux et de leurs habitats?

Qu'est-ce que le rapport *La science en action*?

La science en action offre un nouvel aperçu de la façon dont les recherches scientifiques d'Oiseaux Canada contribuent concrètement à la conservation sur le terrain. Ce rapport rassemble des témoignages et des données clés provenant de partout au pays afin de démontrer comment les données recueillies par plus de 24 000 bénévoles au cours de 1,6 million d'heures passées sur le terrain permettent d'améliorer les politiques, de restaurer les habitats et de renforcer la protection des espèces en péril. *La science en action* de cette année donne vie aux récits que la science révèle, aux personnes qui les portent et aux oiseaux que nous observons et recensons à l'aide de différentes méthodes, afin de comprendre comment nous pouvons favoriser la prospérité de leurs populations. De notre infrastructure nationale de données à la mise en œuvre de nos programmes régionaux, chaque section du rapport répond à une question simple : au cours de la dernière année, qu'a fait notre science pour aider les oiseaux à prospérer ?

Book Review

Saskatchewan Breeding Bird Atlas

Latremouille, L. M., S. L. Van Wilgenburg, C. B. Jardine, D. Lepage, A. R. Couturier, D. Evans, D. Iles, and K. L. Drake (editors.). 2025. Birds Canada, Saskatoon, SK, https://sk.birdatlas.ca

The Saskatchewan Breeding Bird Atlas (the Atlas) is the first one for the province and Saskatchewan and is the last formal original provincial breeding bird atlas completed in Canada outside the three Territories.

It is great that this Atlas is freely available online and the Birds Canada is maintaining with website and the database of over 600,000 records and maps for 271 avian species. Although I love hard copy books (no clicking required or looking at a computer screen for long periods of time), I understand why this Atlas was not printed: cost and likely limited sales for hard copies. I hope this important resource will remain free and available online for years to come. Online resources do come and go over time.

For the first time use of the Atlas, I would recommend reviewing the well-written introductory chapters of the Atlas. These chapters include the purpose, sampling methods and mapping methodologies used and layout of the species accounts. The necessary drought statement was inserted into the Atlas to alert readers to the fact that drought conditions occurred Atlas survey years 2017 to 2021 affected some of the atlas results. I learned about how the data was collected and analyzed and how the Atlas was put together. Point Counts and bioacoustics were key in determining breeding evidence for most species with special attention given to obtain data for rare and colonial breeding species.

I really like the species accounts in this Atlas. They are laid out very well and are user friendly Each species account contains scientific, English, and French names, a fact box, a colour photo of the species two different sized breeding evidence maps, a paragraph summary of the Atlas results and paragraph summary of the species account found in the 2019 book *Birds of Saskatchewan* by Alan R. Smith, C. Stuart Houston and J. Frank Roy. To access the fact box, click on the hyperlink. The fact box contains the conservation rank, Breeding Bird Survey trends (1970-2022), number of point counts that included the species. and number of atlas squares of confirmed, probable and possible of breeding by the species and a hyperlink to the species account in the *State of Canada's Birds*. With the map, you can add five overlays: waterbody names, cities and roads, atlas regions, and bird conservation regions. I found it very helpful to have hyperlinks to the full species accounts in the online pdf version of the Birds of Saskatchewan.

The species accounts section dedicated to potential breeding species and hybrids is missing with 'coming soon' message.

Unlike other atlases, there is an opportunity to go beyond the published book itself. On the Atlas website, there is a detailed and useful tools and resources section. This includes downable maps of overlays of breeding evidence maps in species accounts, forms and instructions, helpful tutorial and bird identification videos and atlas summaries. Additional Atlas data is located on Birds Canada's NatureCounts website. Switching between NatureCounts and the main Atlas websites is not as seamless as it should be, especially going back to the Atlas website from Nature Counts. Atlas summaries include number of checklists, sampled squares, participants point counts, bioacoutic samplings, hours of effort, and the number of species recorded. Clicking on the atlas region will bring up the atlas region's species list and if you know atlas square number you can bring up the square's recorded species list. These species lists will be helpful for planning for future survey work. One can generate atlas effort maps with these four layers: priority squares, square assignments, atlas regions and atlas blocks. Other useful tools include atlas quiz on codes, how bioacoustics were used for the Atlas, point count coordinates, checklists and codes, coverage and breeding maps, and bird species breeding dates for northern and southern Saskatchewan.

A key section of the Atlas is missing. It is the references. On the website, it says 'coming soon'. Without it, the atlas is incomplete. However, there are some limited references in the introductory chapters of Methods, Mapping Methods and How to Read Species Accounts.

An analysis of distributional and abundance changes between the Atlas and the Atlas of Saskatchewan Birds by Alan Smith in 1996 would have been welcome. Alan Smith collected information about breeding birds from numerous sources and plotted breeding status location information onto 1:50,000 topographic maps. Although methodologies used clearly differ between the two publications, a comparative analysis would have illustrated and verified some of these changes in distribution and abundance for some of the breeding bird species over time in Saskatchewan.

I would recommend the Saskatchewan Breeding Bird Atlas to anyone interested in the breeding birds of the province. Completing both the references and potential breeding bird and hybrids section of the species accounts would fully complete the Atlas. It is an impressive work by everyone involved with the Atlas and nicely complements other Canadian breeding atlases completed to date.

Reviewed by Rob Warnock, e-mail: warnockr@myaccess.ca

Bird Art

Red Phalarope (*Phalaropus fulicarius*) by Olivia Maillet

Avian Conservation and Ecology Articles

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Feature in progress – Submissions Now Open

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Bruce Falls	1992-1994	Susan Hannon	2006-2008	Nicola Koper	2020-2022
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David Nettleship	1996-1998	Erica Nol	2010-2012		

MEMBERSHIP INFORMATION

SCO-SOC membership forms can be found at www.sco-soc.ca/membership.html. Current membership rates are provided below. SCO-SOC provides free membership to members of equity-denied communities. See our website for more information.

Student	$15.00/year	Regular	$35.00/year ($45.00/year international)
Early Career (<5 y post-grad)	$25.00/year	Sustained	$75.00/year
Life	$500.00	Retired	$25.00/year

SCO-SOC WEBSITE

The SCO-SOC website (www.sco-soc.ca/index.html) includes sections on membership, meetings, news, publications, awards, information for students, an overview of SCO-SOC, and links of interest to members and other visitors.
Please direct any suggested additions or edits to the website to the Society's webmaster, Jennifer Foote, at jennifer.foote@algomau.ca.

SUBMISSIONS TO PICOIDES

Articles and photos relevant to Canadian ornithology are welcomed by the editors. If submitting photos, please save them in .tiff or .jpeg format with descriptive file names, and supply captions including common names of species, location, date, photographer, and any other notes of interest. Deadlines for submission are February 15, May 15, and October 15; issues are typically published 4-6 weeks later. Please send all submissions to Rob Warnock at warnockr@myaccess.ca. Disclaimer: *Picoides* is not a peer-reviewed journal; the publication of an article in *Picoides* does not imply endorsement by SCO-SOC.