Beaverhill Bird Observatory

The WILLET

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Editor Richard Hedley

2024 Activities at BBO

By Jana Teefy, BBO head biologist

The BBO would like to welcome its members and volunteers to the 2024 field season!

The season will once again kick off with the annual Snow Goose Festival on April 27-28. We are excited to host guided tours throughout the natural area to the observatory for banding demonstrations. Want to volunteer? Sign up here! Want to attend? Get your tickets here! The banquet promises to be delicious and fun!

We are excited to host many other events this spring, including:

- A free event on World Migratory Bird Day May 11
- Spring Songbird banding events starting May 17
- Big Birding Breakfast on June 1-2.

More information can be found below. Keep an eye on your inbox for the announcements!

The BBO staff are excited to participate in the annual Big Birding Day fundraiser once again. You can even sponsor an owl nano-tag through this fundraiser! Donate here!

The field season brings over 27 monitoring projects. With the help of our summer interns, we will continue our long-term monitoring projects on bats, butterflies, Tree Swallows, House Wrens, and the Grassland Breeding Bird Census. We are excited to install 2 additional Purple Martin colony nest boxes and establish an internship to monitor the Purple Martin breeding colony. In addition to banding, the staff will continue monitoring the shorebird and marshbird populations, Least Flycatcher breeding activity, the breeding birds in the forest, our local mammals using trail cameras, and we will establish a new pollinator monitoring project. We will continue to monitor the 48 Northern Saw-whet owls that were nano-tagged last autumn and plan to deploy 50 more owl nano tags this year. We are exploring the possibility of nano-tagging nesting Saw-whet Owls in Alberta to capture a complete picture of their life histories.

We will be hosting work bees in early May to install the Purple Martin colony boxes, repair the current colony boxes, Tree Swallow boxes, and bat boxes that were damaged by cattle in the natural area, and for stewardship and trail maintenance.

Our biologists Jana Teefy and Jon Van Arragon would like to welcome our summer staff who will be joining us this spring. We welcome back our local e-bird celebrity, shorebird expert, and permitted bander, Ethan Denton, who will be joining us between school years at Lethbridge College. We would also like to welcome Young Ornithologist and BBO volunteer Xavier Quantz and Emelie Dykstra, local birder and teaching assistant for Jon Acorn.

Welcome to spring! We can't wait to see you out there!

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Territorial Acknowledgement: Beaverhill Bird Observatory is located within Treaty 6 territory, a traditional gathering place for diverse Indigenous Nations, including the Plains Cree, Metis, Blackfoot, Saulteaux and Nakoda Sioux People, who are the original stewards of the Beaverhill Lake area since time immemorial.
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The Snow Goose Festival is Back!

The BBO is excited to once again co-host the Snow Goose Festival on April 27 & 28, 2024 to celebrate the spring migration of snow geese through Beaverhill Lake. The festival includes bus tours, a free Trade Show in the Tofield Arena, a Banquet & Silent Auction.

Volunteers Needed:
Sign up here for the BBO tour guides
Sign up here for the Snow Goose viewing tour guides

Tours:
Two- and three-hour tours around Beaver County to view the flocks of Snow Geese and other migratory birds. Purchase a ticket here.

Two-hour tours to BBO for a guided hike into the observatory and banding demonstrations. Come say hi and watch the BBO biologists at work! Purchase a ticket here and watch BBO biologists at work.

Trade Show:
Saturday and Sunday 9:30 am - 5:00 pm.
The Trade Show is at Tofield Arena, featuring festival partners, kids activities and Speaker sessions. Come meet our education ambassador birds and see BBO biologist Jon's presentation on our Northern Saw-whet Owl MOTUS project Sunday morning.

Banquet and Silent Auction:
Saturday, April 27 at Tofield Community Hall.
Doors open at 5:30 pm, supper at 6:30 pm.
Keynote Speaker: Geoff Holroyd, Beaverhill Bird Observatory
Live music by Jen Guiton
Get your tickets here!

FREE Shuttle from Sherwood Park:
There is a free shuttle from the Sherwood Park Bethel Transit Terminal to the Festival Saturday & Sunday. Hop aboard the Strathcona County Transit to go directly to the Festival. **Shuttle is free but does NOT include tickets on the Bus Tours from the Festival.**

Visit www.snowgoosefestival.ca for tickets and information!

UPCOMING EVENTS

APRIL
27-28

Snow Goose Festival

Tofield Alberta
www.snowgoosefestival.ca
Tours, Tradeshow, Banquet, Speakers

MAY
11
1-4 pm

World Migratory Bird Day

Free family friendly event at BBO
Banding demonstrations, guided hikes, interpretive talks, kids crafts, ambassador bird meet and greet

MAY
17
Thu-Fri-Sat

Songbird Banding Events

Join the BBO biologists for a morning of bird banding and learn about our research

Ticket sales open in early May!

MAY
20

Big Birding Day Fundraiser

Support our annual birding day fundraiser to help fund our research efforts
donate or sponsor an owl tag **HERE**!

JUNE
1-2

Big Birding Breakfast

Jon BBO biologists for a morning of bird banding, homemade crepe breakfast, kids crafts, and a feather toss
Ticket sales open in early May!

Volunteer Spotlight: Meet three of BBO's most dedicated volunteers

Charlotte Pedersen

I'm currently a student at Portage College in the Environmental Technologist program. I first heard about the BBO when Jana Teefy brought a live bird of prey to our school. I started volunteering in June 2023 and had to quickly learn how to scribe for the banders. On my second day I was delighted to be able to band 3 birds: a Clay-coloured Sparrow, a Brown-headed Cowbird, and a Yellow-bellied Sapsucker! I went back to the BBO as many times as I could over the summer helping with both spring and fall migration, and throughout the fall with the Northern Saw-whet Owls. I even got to band a Long-eared Owl!

I'm very thankful for the staff and other volunteers at the BBO for their patience with me as I am very new to this field and look forward to learning so much more from everyone.

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Irene Crosland

My involvements with Beaverhill Bird Observatory began innocently enough. Out on a walk of discovery at the invitation of a friend who holds adjoining land, I stumbled upon Lisa Priestley banding birds, a whole new thing to me. She let me hold a bird after it was banded and I was hooked. "A bird in the hand", as the saying goes. Having always dived into the natural world with both feet I switched from flowers and mushrooms to birds. Little by little I gained confidence identifying them by sight and sound, getting to do more and more of the hands-on work, but it was with extracting that I became most comfortable. I'm not sure why my skill previously as an obstetrics nurse did not better equip me for the "skulling" technique; after all a sagittal and occipital suture should be the same, right? You figure out the connection between the respective techniques.

The fall Saw-whet Owl banding also became increasingly something I enjoyed and because staffing is often in flux at that time it was felt useful if I could get my bander's permit for these and Boreal Owls. This night-time adventure fits me well. Learning about their aging and sex characteristics, learning of their travels when following up on recaptures is fascinating.
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Still, all birding aside, it is all the young people I have met over the years, some who have remained life-long friends. Kevin Methuen first called me “Field Mom” when I produced cookies to a hungry lad on MAPS field work. Sara Pearce Meijerink called me “Mama Goose”. And so these names give me reason to smile, as my husband and I have enjoyed hosting at our home. In the early years when the facility was even more rustic this might have included a stop for a shower on hot muggy days. Computer connections were not available in the field early on so a cool place to do this work could lead to an invitation to stay for supper. And the water tap filled many a jug of water – another excuse to say a “hello”. Gives us great joy. Yes, being a volunteer is a great way to intersect with Beaverhill Bird Observatory in an ongoing way. Thank you for letting me come by, often unannounced and often just when the help was needed most.

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Madi Szafranski

I've been a volunteer at BBO for two-ish years now, helping with songbird and owl banding, banding events, and other educational events! I've worked around animals and wildlife for most of my career, having worked as an interpreter at the Edmonton Valley Zoo, at different wildlife rehabilitation facilities, and as a falconer and educator at The Raptors. I've always loved animals and have grown quite fond of birds over the years, especially raptors and birds of prey.

Throughout university I had heard of the BBO, and always wanted to come out to visit and volunteer. Finally, in the fall of 2019 I made it out for my first owl banding event! Except, my mom and I had no clue what to expect... we drove through the dark forest on a Halloween Night to the volunteer parking lot (oops!), then we walked terrified through the dark, thinking we were in a horror movie the whole time, to the old banding station. Luckily for us this story turned out ok and we've both loved the BBO, and its owl banding events, ever since. I've had lots of fun the last two falls with all the staff and fellow volunteers, and have appreciated all their knowledge, their teachings, and ability to make everyone feel welcome.

I look forward to banding more birds, learning more about our avian friends, sharing the love for them with more visitors, and hopefully going back to school to do a Master’s on them some day!
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Ringed Kingfisher

Keel-billed Toucan

Plain Chachalaca

Congratulations to Jana and Jon!

After the 2023 field season, Jana and Jon attended the North American Banding Council (NABC) 10-day workshop and certification session at the Toucan Ridge Ecology and Education Society (TREES) in Belize. NABC is a non-profit organization that aims to promote sound and ethical techniques in bird banding that are standardized across North America. This organization offers certification at 3 levels: assistant, bander, and trainer.

Jana and Jon in Belize

The first 5 days consisted of the banding workshop with 16 participants. The days consisted of morning banding, then mid-morning classroom learning sessions, lunch, then more learning sessions, then evening banding. Then we had 2 full days of exams and evaluations, which only 5 of the workshop participants stuck around for. Truthfully, because Jon and I were attempting both the bander and trainer levels of certification, our evaluations started during the workshop and continued into the 2-day evaluation period. We had to prove proficiency in numerous practical skills for the bander level, like net set up and take down, net checks, extractions at 3 difficulty levels, banding procedures including band application and removal, ageing, sexing, skulling, fat scores, and various measurements. For the trainer level practical skills, we were evaluated on our ability to lead and teach everything we were evaluated on at the bander level as well as our critical thinking and problem-solving skills. We also completed a 3-hour written exam and specimen exam on ID, age, and sex for the bander level, created and delivered a presentation to the workshop attendees and completed an interview with the evaluators for the trainer level.

The group during a classroom session. It was easy to get distracted by hummingbirds and toucans right outside the window!

It wasn't all work and no play. Thankfully, we had a one-day break between the workshop and evaluations for a big birding day. The whole group was bussed around Belize for birding opportunities including the Belize Zoo, a beautiful blue lagoon, some eco-resorts, and a cocoa farm/chocolate maker. We finished our evaluations a day early (because we are so awesome) and a smaller group went birding to the coast, which was spectacular!

Look at the beautiful molt limit on this Green Honeycreeper! The blue feathers on the wing, tail, and body are newly replaced feathers and the green feathers are juvenile feathers.

Throughout the trip, we saw over 200 incredible new species, including the Royal Flycatcher, Keel-billed Toucan, Collared Aracari, Magnificent Frigatebirds, Anhinga, Jabiru Stork, Plain Chachalaca, Crested Caracara, Laughing Falcon, Roadside Hawk, Squirrel Cuckoos, Green Honeycreeper, Golden-hooded Tanager, Red-capped and White-collared Manakins, many vulture species, many kingfisher species, and many many species of hummingbirds, parrots, and parakeets. We also saw some favorites from home, like Magnolia Warblers, Ovenbirds, Least Flycatchers, a House Wren, Baltimore Oriole, Gray Catbirds, and Northern Waterthrush, and some from eastern Canada, including Wood Thrush, Kentucky Warbler, Hooded Warbler, Worm-eating Warbler, and White-eyed Vireo.

The view from the lower orchard on net checks

We braved the heat, sudden rainstorms, copious amounts of mud and bugs, the 100% humidity (which you can see in Jon's curls), and a Covid outbreak at the facility. Despite all that, Jana and Jon had a marvellous time and are incredibly proud of ourselves for earning both bander and trainer certifications - the 2 highest levels of certification NABC offers. These certifications offer a higher level of data collection and training opportunities at the BBO. We can't wait for the field season to start so we can put this training into action and teach the summer BBO staff, volunteers, and Young Ornithologists. Thanks to BBO for sending us on this adventure and to a BBO member for your donation to pay for the training!

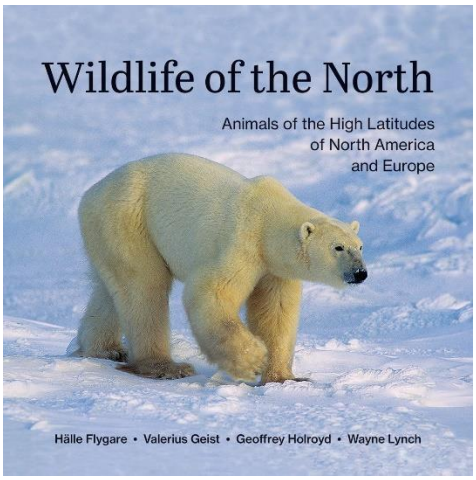
Birds that were capture and banded during the workshop. A Golden-hooded Tanager, Royal Flycatcher, Kentucky Warbler, Common Pauraque

Wildlife of the North

Read about the polar mammals, birds, plants, icecaps and glaciers of North America and Europe with stunning photos. Co-authored by BBO Chair and ornithology expert with 36 years' experience in the Canadian Wildlife Service, Geoff Holroyd.

Signed copies available through Geoff Holroyd for $30 at the Snow Goose Festival and at the observatory. Unsigned copies available through Amazon.

Get your copy now!



BBO Merchandise

The BBO now has an online merchandise store! Purchase t-shirts, hoodies, crew necks, and more with the BBO logo or an adorable Northern Saw-whet Owl on it.
[Check it out today!]

Tru Earth Fundraiser

Please consider supporting the environment and BBO by ordering through our fundraiser link or scan the QR code to place an order

Help Beaverhill Bird Observatory
Earn Money Sustainably
by purchasing
Environmentally Friendly Products
from
TRU EARTH

Place your orders through our Fundraising link

http://tru-earth.sjv.io/BBO

Saw-whet Owl Migration from Beaverhill Lake – Spring update

By Geoff Holroyd

With spring upon us, news of the northward migration of Saw-whet Owls with MOTUS tags that we attached last autumn is arriving! MOTUS is a global wildlife tracking system which uses the same radio frequency to detect the tags and identify each tag's serial number. In the autumn, the owls went to the northwestern US states, but after the end of November we didn't hear of any detections through the winter. Then, in March, MOTUS stations detected the start of their northward migration.

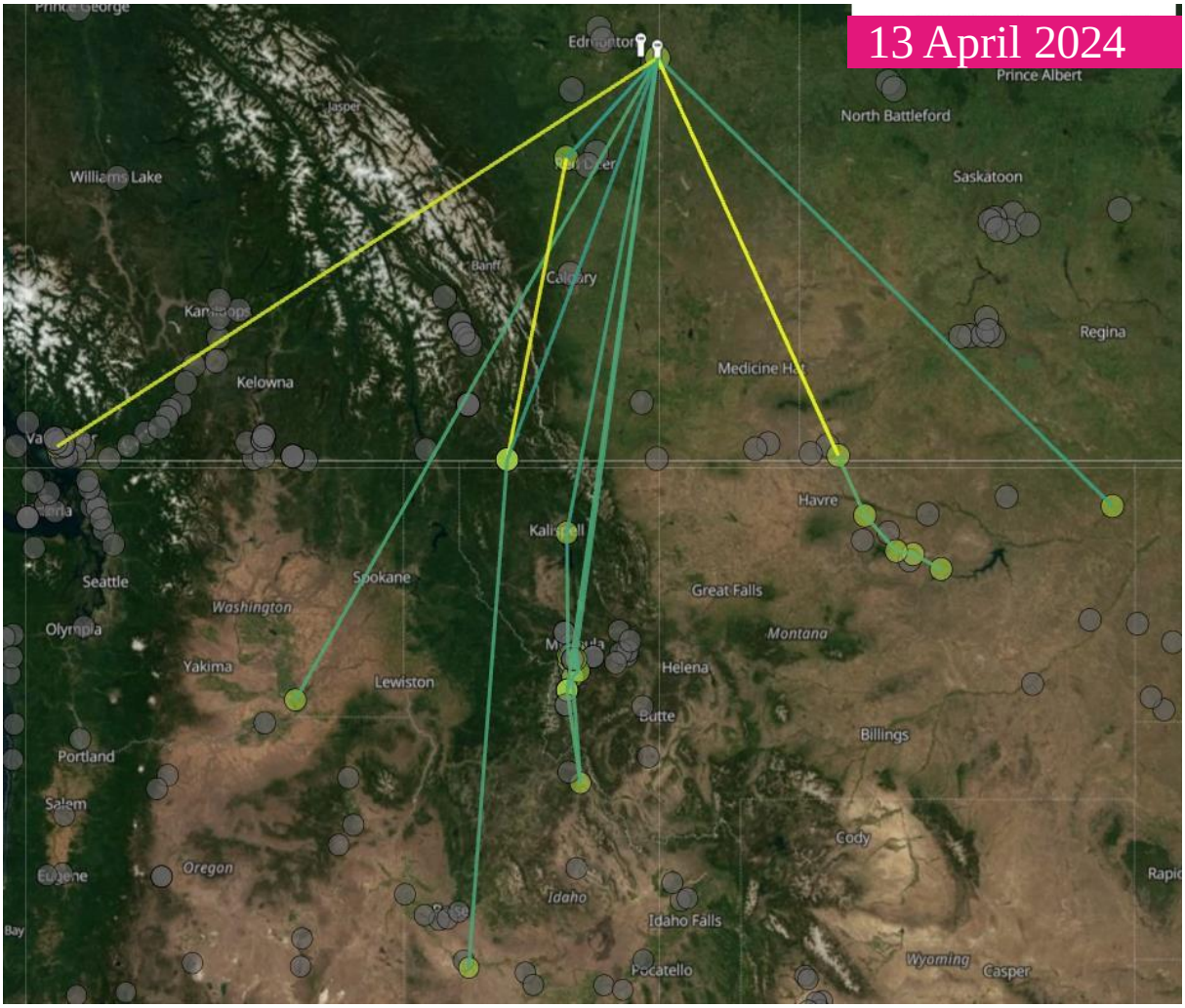
The first detection was on 8 March on the coast south of Vancouver, BC. Then, on the 11 March an owl was detected at Teller Refuge in Montana. On the same day, another owl was detected at McNary National Wildlife Refuge in Washington. On 2 April, an owl that had been detected in October at Sylvan Lake was detected in southern BC at Newgate Ambrose. And the latest record was at Battle River Saskatchewan on April 9. One of the big unknowns in our owls' movements was when the spring migration occurred. Now we have the first indications of its timing, with more detections to come!

Some Saw-whets overwinter in Alberta and are already on their nesting territories with the added advantage of a home before the migrants return. Listen for the owls in woodlots and ravines near your home. If you find nesting owls in central Alberta let us know and we will try to visit and check for a tag on the owl with our receiver. Write to chair@beaverhillbirds.com.

The autumn migration of Saw-whet Owls has been documented at the Beaverhill Bird Observatory for over 20 years. Band recoveries indicated that most owls flew east towards the Great Lakes and eastern North America with a few found to the south and west. However, most owl banders are to the east of us with few to the south and west. In 2023, members of the BBO donated $300 each to purchase 50 MOTUS nanotags. The results have been surprising with all the owls' tags detected to the south and west of Alberta during October and November.

Get Involved – Sponsor an Owl!

We want to increase our sample size and repeat this project again in 2024. With your help we will purchase 50 more tags to attach to Saw-whet Owls in September and October at BBO. The cost to sponsor an owl is $300, which covers the cost of the tag. If you want to sponsor a tag and name an owl in 2024 please donate at https://www.beaverhillbirds.com/get-involved/donate/ and tell us the name of your owl! We will send you a certificate with a photo of your owl and you will receive regular updates on the owl migration project.



Detections of Northern Saw-whet Owls tagged at BBO as of 13 April 2024. All owls shown were tagged at Beaverhill Bird Observatory in autumn 2023.

BBO Chair Geoff Holroyd with a tagged Northern Saw-whet Owl.

Shorebirds of Beaverhill Lake

By Ethan Denton & Geoff Holroyd

In addition to Snow Geese, shorebirds are passing through our area on their way to their arctic nesting grounds.

An American Avocet flies over the lake.

Beaverhill Lake is recognized as one of the foremost shorebird migration stopovers in Western Canada. The lake is recognized as a site of Regional Importance by the Western Hemisphere Shorebird Reserve Network. Surveys in the late twentieth century suggest that around 20% of the continental population of Pectoral Sandpipers staged on the lakeshore, alongside significant populations of Long-billed Dowitcher, Stilt Sandpiper, and Black-bellied Plover. Unofficial surveys in 2005 found 10,000 or more of an additional three migratory shorebird species.

A Long-billed Dowitcher forages in the shallows.

By the early 2000s, Beaverhill Lake had all but dried up. Grasses and forbs invaded the lakebed leaving little to no mud flats. In the 2010s, especially starting in 2016, lake levels rose almost annually. With autumn dry spells, mud flats reappeared, and large flocks of shorebirds were reported by bird watchers on eBird in the 2020s.

In 2023, the Beaverhill Bird Observatory decided to conduct surveys along the southern end of the lake using a standardized protocol of the International Shorebird Survey. Twelve stops were established 400m apart on a 4.4 km stretch of the south shore. Fourteen surveys were conducted on foot from May to August.

Over the course of the surveys, 25 shorebird species were detected. Of these, Lesser Yellowlegs was the most consistently detected, present on 12 of the 14 surveys. Across the entirety of the study period, 36,227 individual shorebirds were observed. Long-billed Dowitcher was the most populous species, accounting for 27,957 individuals or 77% of all individuals. The number of both species peaked on the first survey, conducted on May 7th. There was a significant dip during June, before numbers rose in mid-July and fluctuated thereafter. The highest single-day total of individuals was 12,742 shorebirds, comprised primarily of Long-billed Dowitchers on May 7th. This was followed by August 20th with 9,285. The lowest totals were June 2nd, with 50 individuals and July 25th with 69 individuals.

Young ornithologists learn to survey shorebirds from Ethan. Photo credit: Geoff Holroyd.

Raptors numbers peaked on the 7th of May with 11 species hunting the southern shore of the lake, including Bald Eagle, Northern Harrier, Peregrine Falcon, and Merlin. Peregrine Falcon and Merlin were the only raptor species observed to actively pursue shorebirds during the surveys.

In conclusion, Beaverhill Lake is still an important location for migrating shorebirds. Despite sharp declines in most species, the survey found high enough shorebird traffic on the lake to suggest that there is still adequate habitat to support a large number of staging shorebirds. White-faced Ibis and Black-necked Stilt showed significant increases from the previous surveys, following province-wide trends. One Red Knot was observed on July 17th. This species is in decline and listed as Endangered under the Species at Risk Act. The survey results indicate more than 20,000 shorebirds use the lake annually, as well as over 1% of the country's Long-billed Dowitcher population. Both of these are factors which qualify Beaverhill Lake for continued Regionally Important designation under WHSRN standards.

The full report is available at www.beaverhillbirds.com. If you would like to conduct surveys along the south shore of the lake following the standardized methods, please contact biologist@beaverhillbirds.com.

Forest Breeding Bird Census – 2023 Summary

By Jon Van Arragon, Biologist, Beaverhill Bird Observatory

A Least Flycatcher on its nest. Photo credit: Geoff Holroyd.

In the last 50 years, bird populations in North America have declined 30%, and declines have been especially dramatic among aerial insectivores, including Least Flycatchers. Least Flycatchers are the most common breeding birds in the aspen-balsam forest that dominates the Beaverhill Natural Area. Since 2016, the BBO has conducted territory mapping censuses in this aspen forest to give a more complete picture of forest songbird abundance and population trends in the Beaverhill Natural Area. A territory mapping census covers the same area repeatedly and uses the position of singing male birds to deduce the approximate boundaries of birds' territories, allowing the total number of individuals or each species breeding in an area to be determined.

The aspen-balsam forest found throughout the Beaverhill Natural Area. Photo credit: Geoff Holroyd.

As in past years, Least Flycatchers were the most abundant species followed by Yellow Warblers, House Wrens, Baltimore Orioles, Warbling Vireos and Red-eyed Vireos. A total of 132 territories were identified in the ¼ sq km study area, or over 500 territories per square kilometer! The study led by Myrthe Van Brempt in 2022 showed that our flycatcher population is more productive and at higher density than elsewhere. This high density of breeding birds is sustained by the abundant insect life in the forest.

The previous years of census data suggest that some degree of local population decline has occurred for forest songbirds in the Beaverhill Natural Area over the last 3 years. However, these results should be interpreted with some caution. The territory mapping technique has a high degree of variability inherent in its protocol due to observer bias, as determining the exact boundaries of territories from a map of sightings is slightly subjective.

The full report can be found at http://www.beaverhillbirds.com/media/2446/forest-breeding-bird-census-09.pdf

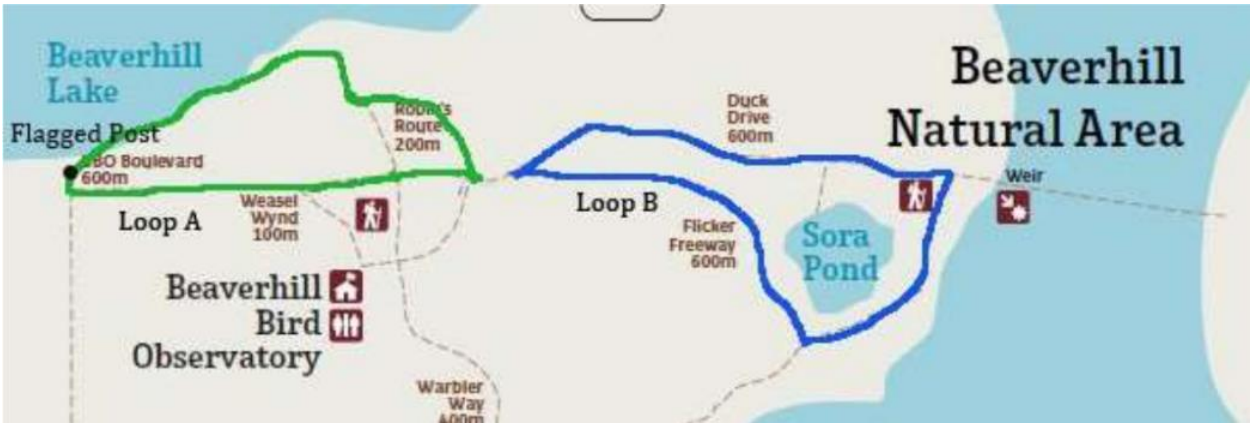
Change in Species Diversity and Population Number of Butterflies in the Beaverhill Natural Area (1996-2023)

By Laura Azzolini Correa, Intern, Beaverhill Bird Observatory

The abundance and diversity of butterflies varies greatly by habitat and over time. Documenting such information is important to detect changes and particularly declines in butterfly populations. The North American Butterfly Association (NABA) first collected data on butterflies in the Beaverhill Natural Area (BNA) for six years starting in 1996. However, the data collection was not standardized since the distance walked, hours of surveying and number of observers were inconsistent for each year. In 2013 BBO initiated a standardized surveying protocol for butterfly populations. This report outlines the impact of incorporating data obtained through diverse surveying methods on the observed results for species diversity and individual counts spanning the period from 1996 to 2013.

The author pursuing butterflies

The number of species per km of the Pollard Transects declined slightly from 0.8 to 0.7, with highs of 1.5 in 2006 and 2014. The number of individual butterflies reported varied considerably between 120 per km to 5 per km. Overall there was a significant decline from about 50 per km in 1996 to about 10 in 2023. To ensure consistency, all survey data was standardized to species and individuals per kilometer and plotted to assess variations arising from different survey methods. Interestingly, when including only the data from the BBO standardized methods, the trend for total butterflies showed a much flatter trajectory. Additionally, the trend for species diversity was shown to be increasing when data with differing methods was excluded, contrasting with a negative slope when included. This shows the impact of standardized methods on observational outcomes, emphasizing the potential for differing interpretations based on the choice of surveying techniques.



Map of the loops walked by the BBO interns that completed butterfly surveys, provided by the Beaverhill Bird Observatory (2023)

A source of error for this paper is that NABA had multiple observers on their counts, additionally, the survey method is unknown which adds even more uncertainty to that set of data. It should also be highlighted that survey method is not the only source of variation; studies elsewhere have shown that the number of individuals and species varies not only with current weather conditions but also previous summer and winter weather conditions. Having surveys completed throughout the season, and on standardized loops helps with data consistency, which is now standard for BBO interns. Species-specific research should also be done for the individuals/km index to show population changes per species. Given that surveying protocol remains for future years and interns are encouraged to survey for all the May-August time frame, it is likely that these analyses will be more accurate.


A Mourning Cloak butterfly captured during the project.

My complete report can be found on BBO's website:
http://beaverhillbirds.com/publications/student-interns/

Impacts of Air Quality on Breeding Success in House Wrens (*Troglodytes aedon*)

By Adrienne Bailey & Willow Zilliox, BBO Student Interns

As global temperatures increase, wildfires are becoming more prevalent. Wildfire smoke decreases air quality, which negatively affects both the health and behaviour of wildlife. In this study, we investigated the impacts of air quality on House Wren (*Troglodytes aedon*) breeding success while monitoring ninety-nine House Wren nest boxes that are maintained by the Beaverhill Bird Observatory in the Beaverhill Natural Area. House Wrens are insectivorous, cavity-nesting passerines that are widely distributed between approximately 58°N in North America to 55°S in South America. With such an expansive range, House Wrens are adapted to a variety of environmental conditions.


A clutch of house wren eggs.


House wren nestlings.

Bird species are particularly vulnerable to air pollutants due to their lung structure, which facilitates one-directional airflow and enables them to take in air both while inhaling and exhaling. Although this lung structure allows birds to obtain twice as much oxygen in hypoxic environments, such as high altitudes, it also makes them vulnerable to air pollutants. Previous research shows that air pollution can affect bird species both physiologically and behaviourally. Physiologically, exposure to air pollutants increases the likelihood of respiratory disease and illness. Furthermore, wildfire smoke can increase avian stress levels and cause immunosuppression. Air quality, including the

presence of nitrogen dioxide, sulphur dioxide, and carbon monoxide, has been listed as a major driver affecting migratory bird mortality. Behaviorally, pollution can result in decreased bird presence, availability, and detectability. For example, in a study in Washington state, wildfire decreased the probability of observing 37% of studied bird species.


One of the authors checking a nest box.

Long-term air pollution also has cascading environmental effects, including reduced prey availability, such as arthropods, and foraging success. As the House Wren diet consists heavily of invertebrates, it is possible that increases in air pollution could similarly impact the resident House Wrens at the Beaverhill Bird Observatory. While it is not the only factor influencing clutch size, an early hypothesis by David Lack suggests that clutch size is impacted by the food availability for future nestlings. Therefore, a large clutch must also be sustainable to feed. If wildfire pollution diminishes food availability for House Wrens, the average House Wren clutch size would also presumably decrease.

In our study, we compared House Wren breeding success over several breeding seasons (2013-2022) and analysed the relationship between air quality (Air Quality Health Index (AQHI), tracked by Environment and Climate Change Canada), the total number of House Wren nests, the average clutch size, and the proportion of nestling survival. Because air quality impacts birds behaviourally, physiologically, and may reduce prey availability, we predicted that there would be a greater number of House Wren nests, a higher average clutch size, and greater nestling survival when air quality health risks were lower during the early breeding season.


Field work at the Beaverhill Natural Area.

We hypothesised that poorer air quality would negatively affect nest initiation dates, clutch size, and nest success rates. However, after conducting a series of correlation analyses, we found that there was an insignificant positive relationship between air quality, nest initiation, clutch size, and nest success. This may be explained using a similar theory to the reproductive compensation hypothesis, which states that animals which mate under non-ideal circumstances, specifically with a non-preferred partner, will produce a greater number of offspring to improve the chances of offspring survival. During times of decreased air quality, a similar mechanism may encourage House Wrens to lay more eggs to increase the likelihood of reproductive success. A species' response to decreased air quality is difficult to separate from other environmental stressors. Therefore, it is possible that the results of the study were influenced by factors which were not accounted for.

The full article and references can be found at
http://beaverhillbirds.com/publications/student-interns/

2023 Grassland Breeding Bird Census in the Beaverhill Natural Area

By Janine (Jasper June) Heber, BBO Intern

In the last several years, populations of grassland bird species have declined. The Grassland Breeding Bird Census is conducted by interns each summer for the BBO to monitor breeding bird territory abundance in the Beaverhill Natural Area. This study uses the spot mapping or territory mapping census repeated 6 times to determine the number of territories of each species in the study area. Ten species were recorded in the grassland study area in 2023. Least Flycatchers were the dominant species in the aspen woodland, Yellow Warblers in the shrubland and Savannah Sparrow in the grassland. This report analyzed whether breeding bird species territory densities were associated with annual precipitation levels in the Beaverhill Natural Area from 2016 to 2023. Results showed that breeding bird territory abundance may not be affected by annual rainfall or that rainfall has remained relatively stable over time.

Annual number of breeding bird territories in the Grassland Grid, by species, showing changes in species abundance across an 8-year period.

Species	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Alder Flycatcher	13	5	12	10	0	6	1	3
Least Flycatcher	27	3	2	16	15	21	24	26
House Wren	1	4	1	2	4	1	4	4
Sedge Wren	0	0	0	5	12	6	5	0
Gray Catbird	0	0	3	0	0	0	1	0
Yellow Warbler	43	24	20	25	24	41	26	36
Common Yellowthroat	0	1	9	19	24	49	21	23
Savannah Sparrow	52	32	6	14	8	7	12	4
Clay-colored Sparrow	83	42	23	49	32	48	31	43
LeConte’s Sparrow	7	0	0	39	31	24	12	9
Nelson’s Sparrow	0	0	0	0	19	13	9	8
Song Sparrow	0	3	4	7	3	0	1	3
Red-winged Blackbird	1	4	2	16	20	18	17	19
Black-capped Chickadee	3	0	0	7	0	0	2	2
Warbling Vireo	0	0	0	3	0	0	4	3

Winged Whispers: Tales from the Tree Swallow Studies

By Jinxuan Cui & Lucille Wang, BBO Interns

An adult Tree Swallow incubating eggs.

During the summer of 2023, we interned as student researchers, monitoring Tree Swallows at the Beaverhill Bird Observatory. Our work was conducted under the supervision of Dr. Ivana Schoepf, an assistant professor from the University of Alberta, Augustana Campus. This experience deepened our fascination with Tree Swallows (*Tachycineta bicolor*). Tree Swallows, aerial insectivores primarily consuming flying insects, are facing significant population declines in North America. Tree Swallows are cavity-nesters and have been extensively researched through the use of artificially constructed nest boxes, providing valuable data on their breeding habits, such as average clutch sizes and hatching success rates. Despite being well-researched, the reasons for their decline remain unclear.

Newly hatched chicks with an unhatched egg.

We conducted a study that focused on the difference between Tree Swallow breeding success across two natural sites and one agricultural site, using clutch size and hatching success as indicators. This investigation aims to elucidate the impacts of land-use changes on Tree Swallow populations, offering insights that could inform conservation strategies for aerial insectivores facing similar challenges across their ranges.

A young clutch of tree swallows.

In conclusion, this study found Tree Swallows had a weak association between clutch size and site selection. While birds in the agriculture area had smaller clutches than those in the natural area. Additionally, there was no overall difference in hatching success between these sites which suggests agricultural activities and human disturbance might not be primary factors in the population decline. Future research should explore additional reproductive success measures like fledging success to better understand site selection's impact on fitness in Tree Swallow populations.

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