

Mackenzie Nature Observatory

Mugaha Marsh Banding Station

2023 Annual Report



Mugaha Marsh Banding Station is a cooperative project. Some of our main sponsors identify the project by a name and/or number:

Fish and Wildlife Compensation Program – Peace Region

Project name: Mugaha Marsh Banding Station, 2023-2024

Project Number: PEA-F24-W-3943-DCA

The Project is partially funded by the Fish and Wildlife Compensation Program (FWCP). The FWCP is a partnership between BC Hydro, the Province of BC, Fisheries and Oceans Canada, First Nations and public stakeholders to conserve and enhance fish and wildlife impacted by the construction of BC Hydro dams.

Environment and Climate Change Canada

Project Name: Migration Monitoring at Mackenzie Nature Observatory

Project No. GCXE22C004

This project was undertaken with the financial support of:

Ce projet a été réalisé avec le soutien financier de:

*Environment and
Climate Change Canada*

*Environnement et
Changement climatique Canada*

McLeod Lake Mackenzie Community Forest

Project: cell phone booster and improvements to Mugaha Marsh Banding Station

Birds Canada (BSC), Canadian Migration Monitoring Network

Mackenzie Nature Observatory (MNO) is part of the Canadian Migration Network. As such, we receive 75% of funds raised by individuals doing the Great Canadian Birdathon in support of Mackenzie Nature Observatory. The Birdathon is coordinated by Birds Canada.

Cover: Mugaha Marsh (Photo: Natalie Srochenski)

MACKENZIE NATURE OBSERVATORY
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<https://www.instagram.com/MackenzieNatureObservatory/>

The Mackenzie Nature Observatory is an incorporated society and a registered charity. Our members enjoy nature and we are involved in various projects. This report will give an overview of the activities of the station for the current year.

Purposes of the Society:

- *To research, conserve, restore and assist in the management of the natural resources found in the Mackenzie, BC area.*
- *To promote the understanding and enjoyment of nature by providing opportunities for public participation and education in habitat enhancement, restoration and monitoring projects that will provide additional public knowledge regarding nature.*
- *To encourage and engage in the protection and restoration of threatened and endangered species with special attention to the preservation of essential habitats.*

Our Executive Committee:

President: Ryan Bichon

Vice-President:

Secretary:

Treasurer: Sarah Curtis

Directors: David Lambie

Sandra Kinsey

Angelina Joiner

Director for BC Nature: Jeanne Shaw

EXECUTIVE SUMMARY

Mackenzie Nature Observatory started banding passerines at Mugaha Marsh in 1994. Since then, over 80,000 birds have been banded. In 2023, 2799 birds of 62 species were banded during the Standard Banding period of July 19 to September 23. The average catch rate was 0.6157 birds/net hour (average 0.6633). The top six species were Ruby-crowned Kinglet (334), Swainson's Thrush (273), American Redstart (256), Golden-crowned Kinglet (213), Dark-eyed Junco (171), and Wilson's Warbler (147). Noteworthy species were the first ever Broad-winged Hawk banded in the history of the station, the second ever Mourning Warbler, the sixth ever Cape May Warbler, and the fifth ever Rose-breasted Grosbeak. All these species are considered "eastern species" as they are common east of the Rocky Mountains. Weasels, wildfires and generally cool, very dry weather were challenges this year.

In 2023, Non-standard Banding involved the re-opening of four previously-used net lanes, which had been discontinued in 2002 as a result of high reservoir levels. An extra week of banding was also added at the end of the season as a pilot project; consequently the station was open until September 30.

Individuals and families from Mackenzie, Prince George, and farther afield visited the station for morning banding of passerines. Nets for Northern Saw-whet Owls were set up in September, on a volunteer basis, with 125 visitors hosted on ten of the nights. The addition of an Instagram account and weekly postings to Facebook served to increase MNO's social media presence. A booth at the annual May Leisure Fair and Thursday Community Markets provided face-to-face outreach opportunities with Mackenzie residents.

Next year, in addition to continuing the Standard Banding program for passerines, the station is planning to run a standardized program for Northern Saw-whet Owls. Pilot projects involving the use of the four previously decommissioned net lanes and an extended season until September 30 will continue. Social media reporting and attendance at face-to-face events in Mackenzie will also continue, with the goal of encouraging people to visit the banding station and get more involved in MNO activities.

PRESIDENT'S REPORT - 2023

2023 was an outstanding year for our bird banding station at Mugaha Marsh. Our banders were extremely energetic and enthusiastic, attending the local Leisure Fair and Community Markets as volunteers to help promote our station. They also developed an Adopt-A-Bird program for people to register their name to a particular songbird or owl and be notified if their bird is ever recaptured. The banders did an excellent job of reporting regularly on social media, with lots of great photos being shared.

Our owling program was extremely successful and attracted lots of visitors to the station. Owl banding at Mugaha has always been voluntary and ad hoc over the years. The banders experimented with some new owl net locations this year, with great success. We are now considering using these net lane locations to expand our owl banding into a full-blown, structured and standardized program.

Many thanks to everyone who volunteered their time, doing everything from site improvements to administrative duties to operational setup at the start of the season to daily assistance with bird banding to cleanup and takedown at the end of the season. Thanks also to everyone who visited the site. Public awareness and education are a big part of why we exist. We hope everyone who visited the station enjoyed their time there as much as we enjoyed having them.

A huge thank you to everyone who helped make 2023 such a success! I look forward to another great season in 2024.

Ryan Bichon,
President

<p>In the 2022 Annual Report last year, we told you about a Northern Saw-whet Owl we caught that had been banded elsewhere. We learned it was banded by Janos Kovacs at his station near Edmonton, Alberta, on Sept. 17, 2021, as a Hatch Year male.</p>
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ERRATA: In the 2022 report we mixed up the sapsuckers on Page 14. The top photo is the hatch year (HY) bird, the bottom photo is the adult (AHY) bird.
ERRATA: On Page 15, the shrike photo is actually of a young Eastern Kingbird.

ACKNOWLEDGEMENTS

2023 was another busy year for members of MNO and we would like to say a big “Thank You” to everyone who volunteered their time to keep the project going. Thank you everyone! And, thanks to all our sponsors and donors for their continued support.

Thanks to all the volunteers who assisted at the station this year. Some of you came out early to help the banders and stayed for the full day; others came when they could and still other volunteers from out of town drove many kilometers to assist the banders. Together, our volunteers put in hundreds of hours at the station over the ten weeks.

Thanks to our staff, Laura Tabbakh, Kirstin Lachance, and Benjamin Breton, for an amazing season at Mugaha and for donating their time during time off to conduct outreach and do owl banding in September. Special thanks to Laura and Kirstin for their reports on the season. Many thanks to Laura, Kirstin and volunteer Lucile for launching our Instagram account and keeping it active and engaging along with our Facebook page; we have had many positive responses.

Thanks go to these people for taking photographs with their own devices and sharing with us: Sue Crosby, Lucile Jacques, Sandra Kinsey, David Lambie, Laird Law, Kirstin Lachance, Barb Paterson, Jeanne Shaw, Anne Spiers, Natalie Srochenski, Laura Tabbakh and the UNBC student chapter of The Wildlife Society. Some of the photos will challenge your identification skills, especially since they are young birds. Mention of moulting birds is included. As you will see, moulting birds added another challenge to the identification of the birds.

Thanks to Sarah Curtis for writing the Funding Sources section and Sue Crosby for

the reports on the second year of monitoring Osprey and Bald Eagle nests and the MOTUS tower. Thanks to Laura Tabbakh for preparing the bulk of the report while Sandra was away. Thanks to Ryan Bichon for the President’s report. And special thanks to the others on the Board: Ryan, Sarah, Jeanne and Angelina, without whom we wouldn’t have operated in 2023.

Many thanks go to local MLA Mike Morris and Assistant Jesse Wright for their ongoing interest and support and their promotion of the station via their social media platforms.

We had visitors and volunteers in-training who enjoyed learning about birds and our station. They all appreciated the birds. Some of them will be coming back next year as volunteers!

If you would like to get involved in the station, including during the off-season, contact the club at the email addresses on Page ii.

Visitors can also participate by sharing their eBird lists with the station. Username is MNOebird.

Happy Birding,
Sandra Kinsey and David Lambie

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MIGRATION MONITORING MUGAHA MARSH BANDING STATION, MACKENZIE, BC

Background

The migration monitoring program started in Mackenzie in 1994 as a cooperative project between the Canadian Wildlife Service (CWS) of Environment and Climate Change Canada (ECCC), local forest companies, and the Mackenzie Nature Observatory. We started the project when we were known as the Environment Section of the Mackenzie Fish & Game Association. When we wanted to become a charity we formed the Mackenzie Nature Observatory (MNO).

For the first few years, volunteers did bird surveys on set routes in spring and fall. They also operated a banding station in the fall under CWS's permit. The first banding station (1994 & 1995) was at Gagnon Creek south of Mackenzie. In 1995, a banding station was started at Mugaha Marsh and in 1996 it became the only banding station.

The program is a cooperative project supported by various government and non-government organizations and foundations, local businesses and individuals, the community of Mackenzie and many, many volunteers.

Mackenzie Nature Observatory is one of 25 member stations of the Canadian Migration Monitoring Network (CMMN), a collaboration of bird observatories from across the country, along with Birds Canada



(formerly Bird Studies Canada) and the CWS. CMMN provides vital long-term information on

bird demographics and population trends for more than 200 bird species, and contributes data that advance the understanding of birds and other aspects of natural history in Canada.

Mackenzie Nature Observatory's volunteer Board of Directors supervises the seasonal operation of the station, raises funds, obtains permits, hires banders, and recruits volunteers. It also submits all appropriate data to various agencies: the Canadian Bird Banding Office, CWS (Environment and Climate Change Canada), Birds Canada (BSC) and the BC Wildlife Species Inventory Database. CWS is responsible for the regional analysis of the data and BSC for the national analysis of the data. Information from our Daily Estimated Totals Program is posted on the NatureCounts website (<https://naturecounts.ca>)

Mugaha Marsh Banding Station is located on the west side of the Rocky Mountains in the Rocky Mountain Trench in central British Columbia. It is east of the Parsnip Reach of Williston Reservoir. Some net lanes are actually in the floodplain of the reservoir when it is at or near full pond. To the west of the reservoir lie the Omineca Mountains. These landscape features create a funneling effect making Mugaha a suitable location to monitor the migration of species breeding in the forests and mountains of northern British Columbia, Yukon and Alaska.

MNO follows a standardized protocol that meets the requirements of CWS and CMMN. MNO supplies the specialized banding equipment and laptops needed for the program, and has a banding lab on site. The banders are hired as employees of MNO and are covered by WorkSafe BC. MNO also carries third party liability insurance through BC Nature for the volunteer work done for the banding station.

Goals and Objectives

The migration monitoring program in Mackenzie has three broad goals:

- To monitor changes in the populations of small landbirds that use and migrate through the Mackenzie area by providing annual indices of population numbers and structure, species composition, migration timing and possibly survival rates and indices of productivity. Of particular concern are species not effectively monitored by other survey methods (e.g. Breeding Bird Survey) and species showing declines in other regions.

- To understand migration ecology and its relationship to breeding dynamics and management issues, particularly the significance of Mugaha Marsh as a stopover site.

- To build partnerships within the community and between industry, naturalists, academia, First Nations, governments and interested citizens.

The program has several objectives:

- To identify and count individuals (observed and captured) daily of each species or subspecies, new and recaptures, using standard, nationally-accepted protocols during fall migration.

- To determine the age and sex composition of captured and observed birds for a demographic picture of species migrating through the area.

- To augment public interest and local knowledge of environmental issues through involvement and training opportunities.

- To produce annual reports. MNO will produce an annual report summarizing the season, containing numbers and composition of captures and recaptures, comments on habitat changes, weather conditions and other factors that may have affected the capture of birds locally. CWS BC/Yukon Region will produce an annual report analyzing the data on a regional basis.

- To investigate the use of migration numbers as an index of productivity, particularly for forest birds.

- To support further integrated research.

- To reduce, where possible, biases in sampling by improving survey protocols and skills of observers, maintaining local vegetation structure and composition, and supporting consistency of the surrounding landscape of Mugaha Marsh. We will investigate the best measurements and influences of variation in capture population (e.g. age, sex, migratory status, moult, mass gain) and other, uncontrollable potential sources of biases (e.g. weather, habitat change in the surrounding landscape, insect outbreaks, water levels) on the observed trends and adjust analyses accordingly.

- To follow a standardized protocol meeting the scientific requirements of CWS and CMMN.

Study Area

Mackenzie Nature Observatory's migration station is located at Mugaha Marsh, 14.5 km northwest of Mackenzie, B.C., latitude N55°23'55", longitude W123°12'30". UTM coordinates are 10U / 0486575 / 6139133.

The station lies within the Mugaha Marsh Sensitive Area, which was proclaimed under the Forest Practices Code of BC Act in 2001. The banding site is also within the McLeod Lake Mackenzie Community Forest.

Mugaha Banding Station consists of a permanent banding laboratory, living area, public wildlife viewing platform, parking lot, 32 net lanes (12 nets are used annually), and a census route. This site can be used for spring and fall banding.

The Recording Area boundary for counting birds extends from the trees at the southwest

edge of the marsh, to the trees bordering the northeast bank of the pond, to include species not observed elsewhere in the marsh. For passerines and near passerines (woodpeckers, hummingbirds, swifts and kingfishers), the boundary extends west along the main road until hydro pole #115, south along the main road until hydro pole #107, and north in the forest along the trail to Tutu Bay, until the aspen with three pink ribbons. There is no set distance for all other non-passerines.

Methods (a summary)

Mugaha Marsh Banding Station operates only during the fall migration season, from July 19 to September 23 (67 days). Starting in 2023, a week was added to the end of the season, from September 24 to September 30, inclusive, as an experiment. Also added this year were four decommissioned net lanes (Nets 13, 14, 15, and 16) for the season, also as an experiment. This experimental banding is deemed Non-standard Banding. Any birds re-captured in the standard nets became Standard Banding captures.

The station operates 12 12-metre passerine mist nets for six hours starting at sunrise, weather permitting. This is our Standard Banding period. The nets are checked every 30 minutes, more frequently if conditions warrant. The banders and trained volunteers extract the birds from the mist nets and place each bird in individual bird bags. The birds are then taken back to the lab for the banders or trained volunteers to identify to species (and sometimes to subspecies), age and sex, and place a small metal band (with its own unique number stamped on it) on the bird's leg. The band number, species, age, sex, date, net and time are recorded along with physiological measurements such as wing length, fat, muscle development, presence and type of moult and weight. The bird is then released. The same data is collected on previously banded birds that are recaptured,

unless it is a same day recapture in which case the bird is released at the net.

A one-hour, one kilometre long census is conducted over a standardized route each day, regardless of weather, recording all birds observed or heard in the Recording Area. In fall, this can be difficult as often birds do not sing; they merely make chip notes or, at other times, are silent as they flit through the vegetation.

In addition, observations of bird activity are recorded during the standard 6-hour banding period. Birds observed outside the 6-hour standard banding period may also be recorded, but these are kept separate from the observations during Standard Banding.

Totals from banding, recaptures, observations and census are used to compile an estimated total of the birds in or passing through the area each day.

Hummingbirds captured in the nets are banded when an authorized bander is present. The data for hummingbirds is kept separate from other songbirds and considered Non-Standard Banding as not every year does the station have someone permitted to band hummingbirds.

MNO also conducts Northern Saw-whet Owl migration monitoring in September. Both owl nets and passerine nets are used for this project. Audio lures are played starting 30 minutes after sunset for a varying amount of time, depending on the banders and the weather conditions.

Owl banding is currently volunteer-based and non-standardized. Plans are in the works to develop a full-time standardized owl banding protocol.

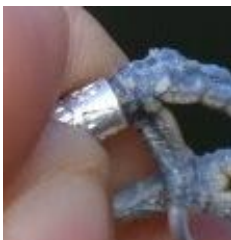
REPORTING BANDED BIRDS

Banded birds help scientists track the movements of birds. If you find a banded bird it is important to note as much as you can about the bird. If the bird is found alive, please do not try to remove the band. This could result in an injury to the leg (banders use special tools when a band needs to be removed). Please note the following information:

1. Numbers, in sequence, appearing on the band or bands
2. Colours, codes and materials of any bands or markers in addition to a metal band
3. Date on which the bird or band was found or observed
4. Exact location the bird or band was found or observed
5. Species, sex and age of the bird (if known)
6. Whether the bird was alive, dead, injured, free, or trapped
7. How the bird died (if known)
8. Online: <http://www.reportband.gov>
Or by phone 1-800-327-BAND (2263).
Or by mail: Bird Banding Laboratory
12100 Beech Forest Road
Laurel, MD 20708

For more information on reporting band recoveries see the Environment Canada webpage on [How to report a banded bird - Canada.ca](http://www.canada.ca/en/environment-climate-change/services/bird-banding/how-to-report.html).

<https://www.canada.ca/en/environment-climate-change/services/bird-banding/how-to-report.html>



FUNDING AND IN-KIND SUPPORT

The Mugaha Marsh Banding Station is a cooperative project with a variety of sources providing funding, in-kind donations and many hours of volunteer service. MNO extends a special “Thank You” to all our sponsors. Whether your contribution is financial, material or volunteer service, your help is greatly appreciated.

Funding Sources

Thank you to everyone who provided financial support to the Mugaha Marsh Banding Station in 2023.

Mackenzie Nature Observatory gratefully acknowledges the **Fish and Wildlife Compensation Program** (www.fwcp.ca) for committing \$25,050 for 2023.

Thank you to **Canadian Wildlife Service, of Environment and Climate Change Canada**, for its financial contribution of \$10,000 for the 2023 season.

Thanks to Ray Sturney and Maureen Sargent for participating in the 2023 Great Canadian Birdathon on behalf of MNO. They are long-time supporters. We received \$1728.75 from **Birds Canada** for our share of the proceeds. As a CMMN banding station, MNO received 75% of the funds they raised. Thank you for thinking of us!

We express our gratitude to the PayPal Giving Fund, the Provincial Employees Community Services Fund, anonymous donors, and to all those who participated in the Adopt-A-Bird program.

Thanks to the businesses and individuals who made donations to MNO in 2023: Nancy Krueger of Prince George; Jane Potter of Calgary, Alberta; Sara Sparks of Prince George and to everyone who donated during events in Mackenzie.

In-kind Support

Thank you to **Ministry of Forests**, in Mackenzie, for allowing us to store our trailers and campers, used for accommodations at the banding station, at their compound during the off season.

Thanks to the **District of Mackenzie** for grading the road to Mugaha Marsh and for allowing our banders and out-of-town volunteers to use the showers at the Municipal Campground and Recreation Centre.

From the banders:

“Thank you to the **Mackenzie Community Market** for receiving us twice this summer, allowing us to reach out to the locals and talk about the research we do right in their backyard. The experience was so gratifying, and we will definitely be going back next year!”



*The staff at our first visit to the community market. Left to right: Banders Ben, Kirstin and Laura, and volunteer Lucile
(Photo: Laura Tabbakh)*

Thanks to the **Mackenzie Public Library** for again hosting our display in their window. As she does each year, Jeanne Shaw set up the display. The exhibit explains bird migration and the work we conduct at the station.



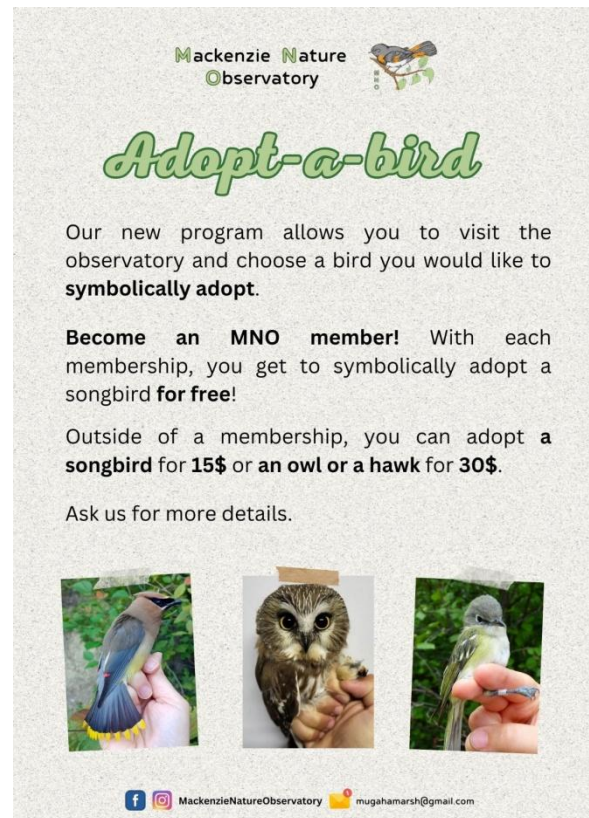
Window display at the Mackenzie Library, summer 2023 (Photos: Jeanne Shaw)

Adopt-A-Bird program

In September, we launched an Adopt-A-Bird program where people can sponsor a passerine for \$15 and a raptor for \$30. As a thank you for their sponsorship, they are presented with an adoption certificate containing the information of their adopted bird: band number, species, age, sex, wing length and weight. They will also be notified if their bird is ever caught again. New members were also offered a passerine to adopt as part of their new membership.

The program, combined with the owl visitor nights, was a quick success: in only one month, 30 owls and 18 passerines were adopted, raising over \$1,000. More birds were adopted during the Christmas holidays.

We hope to catch some adopted birds back again next year!



The poster features the Mackenzie Nature Observatory logo at the top, which includes a small illustration of a bird. Below the logo, the title "Adopt-a-bird" is written in a large, green, cursive font. The text describes the program, stating that visitors can visit the observatory to choose a bird to symbolically adopt. It highlights that becoming an MNO member allows for a free songbird adoption, while non-members can adopt a songbird for \$15, an owl for \$30, or a hawk for \$30. The poster includes three photographs of birds: a blue bird, an owl, and a green bird, each being held gently in a person's hand. At the bottom, there are social media icons for Facebook and Instagram, the website MackenzieNatureObservatory, and the email address mugahamash@gmail.com.

Mackenzie Nature Observatory




Adopt-a-bird

Our new program allows you to visit the observatory and choose a bird you would like to **symbolically adopt**.

Become an MNO member! With each membership, you get to symbolically adopt a songbird **for free!**

Outside of a membership, you can adopt a **songbird for 15\$** or an **owl or a hawk for 30\$**.

Ask us for more details.

  MackenzieNatureObservatory  mugahamash@gmail.com

*Bird adoption program poster. Design:
Volunteer Lucile Jacques*



STAFF

Returning Bander-in-Charge (BIC) for 2023 was Laura Tabbakh. Laura was introduced to banding and migration monitoring at the McGill Bird Observatory (Quebec) in 2016. She has since continued to train, work and volunteer at the Koffler Reserve (Ontario), Last Mountain Bird Observatory (Saskatchewan), Thunder Cape Bird Observatory (Ontario), and Lesser Slave Lake Bird Observatory (Alberta), before landing at MNO in 2021. When she is not away from home on a contract, she remains a regular volunteer at MBO for spring and fall migration, Monitoring Avian Productivity and Survivorship (MAPS), winter feeder banding, and Northern Saw-whet Owl and Snow Bunting banding.

Returning Assistant Bander # 1 (AB#1) was Kirstin Laviolette Lachance. Kirstin got her first taste of bird banding in 2018 through an ornithology course at Vanier College (Quebec). After graduating, she left the banding world for a few years, and worked various positions, including zookeeper, environmental technician, wildlife field assistant, environmental educator, and point count technician. But she could never stay away from the banding world very long. Her work and volunteer experience in bird banding include Prince Edward Point Bird Observatory (Ontario), Owl Moon Environmental (Alberta), Lesser Slave Lake Bird Observatory, McGill Bird Observatory, and Beaverhill Bird Observatory (Alberta).

Assistant Bander # 2 (AB#2) this year was Benjamin David Breton. Ben developed his passion for birds early, for raptors specifically, and was also introduced to bird banding via Vanier College in 2018. After college, he worked at the Ecomuseum Zoo (Montreal) for 5 years as a zookeeper for all species of Quebec, but of course took a

special interest in training many different species of raptors and corvids. He also volunteered at Prince Edward Point Bird Observatory to visit Kirstin during the owl banding season in 2021, as well as the McGill Bird Observatory. We were very happy to have him join the team this year!



Left to right: Bander-in-charge Laura, Assistant Bander 1 Kirstin and Assistant Bander 2 Ben (Photo: Barb Paterson)



Volunteers at the station

VOLUNTEERS

by Laura Tabbakh

The station had a number of local and out-of-town volunteers and volunteers-in-training. Together, they put in over 2217 hours during the 11 weeks the station was open.

Our local volunteers and volunteers-in-training were Elaine Bambrick, Ryan Bichon, Ken Bohn, Sue and Ron Crosby, Erin Gilbert, Aven Hogg, Dana Hopfauf, Barry, Dannie and Tim James, Karen Jungnitsch, David Lambie, Marisa Lei, Barb and Ron Paterson, Melissa Pick, Kieran Sculley, Kirk Smith, Doug Thompson, Trudy Tremblay and Jim Wellsman, and Thomas Zhu.

We also had volunteers and volunteers-in-training from out of town: Megan Connell, Jac Curry, Christina Cutbill, Jeff Dyck, Lucile Jacques, Sierra Jamieson, Angelina Joiner, Sandra Kinsey, Janos Kovacs, Kessie Konwicki, Laird Law, Jamie Quinn, Lauren Quinsey, Jeannine Randall, Kalum, Natalie, and Jeremy Srochenski, Myrthe Van Brempt, and Suzy Wright.

Apart from the usual maintenance work at the station and the set-up and takedown of the banders' living accommodations, this year's main project for local volunteers was the reopening of four net lanes last used in 2001. That meant a massive clean-up of the area where the net lanes were located, as well as the installation of two sets of stairs (thanks to funding from the McLeod Lake Mackenzie Community Forest).

Those nets were a welcome addition to our banding protocol and we cannot thank the team enough for all their hard work in making this possible: Ryan and Kessie; Sue and Ron; Barbara and Ron; Doug and Karen; Barry, Dannie and Tim; David and Ken.



*Volunteers Ken, Ron and Doug (left to right) working on the new stairs
(Photo: Sue Crosby)*



*Volunteers Kessie (left) and Dannie (right) helping build the new stairs
(Photo: Sue Crosby)*



Volunteer Ron standing proudly on top of the new stairs (Photo: Sue Crosby)

Another set of new stairs also needed to be built to safely access a new set of owl net lanes up the road. Volunteer Doug and volunteer board director David buckled down and got it done in the matter of an afternoon. That's efficiency!



New set of stairs for the new owl net lanes (Photo: Sue Crosby)

A training and review workshop was held just before the station opened for returning and new volunteers. Everyone found it very helpful. The station will put on more in the coming years.



Out-of-town volunteer Jeannine (left) and bander Laura (right) trying to decide which way to go first to return all the pegs (Photo: Lucile Jacques)



Pizza party for the crew on the last day of the season (Photo: Natalie Srochenski)



Everyone helped to take down the nets on the last day of banding (Photo: Natalie Srochenski)

This does not reflect the many hours put in before, during and after the season by the MNO Board of Directors. In addition, the banders put in many hours of volunteer time for owling and assisting, when they weren't scheduled to work, to conduct the daily census on their days off and help when the

morning got busy or when an extra set of hands was needed to close the nets. The banders and volunteers also put in countless hours into public outreach, launching and managing a new social media account and a bird adoption program. Our heartfelt thanks go out to them all.



*A memory picture of a wonderful two weeks at the station. Left to right: volunteer Laird, banders Kirstin and Ben, volunteer Janos, bander Laura, volunteers Lucile, David and Sandra.
(Photo: Lucile Jacques).*



Visitors at the station

VISITORS AT MNO

by Laura Tabbakh and Kirstin Lachance

We were fortunate to be able to host a number of organized group visits to the station this year. Our banders and volunteers enjoyed showing off the station and answering questions. Special thanks to our Banders Laura, Kirstin and Ben who willingly shared their extensive knowledge and experience with our visitors, and to volunteers Sue, Lucile and Lauren who helped manage large crowds on some occasions.

Outside of organized group visits, the station received numerous visits from locals who came to learn about migration and banding; see birds up close; discover the station; or just chat with our banders and volunteers on a sunny morning. We were especially popular with the little ones who loved nothing more than holding then releasing birds.



The little ones... and the big ones. Bander Laura gives UNBC student Chad a bird to hold and release. The smile says it all (Photo: Lucile Jacques)

This year was busier than usual with visitors. In July and August, we received many people from Mackenzie and abroad. Travellers and families with children drove up to learn about banding and see some birds. Several of them were locals who have

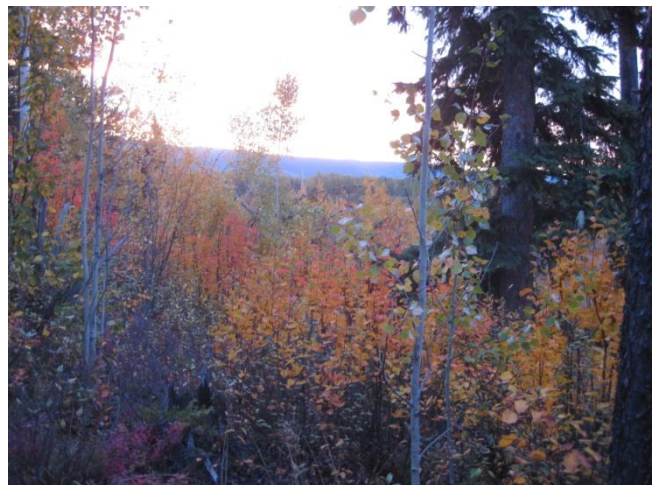
made the station a part of their summer program. About a hundred visitors came to spend their morning with us, and we loved having them!



Left to right: Bander Kirstin, UNBC visitors turned volunteers Megan and Jamie, volunteer Lauren, and banders Laura and Ben (Photo: Lucile Jacques)

September was the month of school and university groups.

On the weekends of 9-10 September and 16-17 September, the UNBC Student Chapter of the Wildlife Society came for an overnight visit. A total of 24 students came up to (re)discover our station and banding in general. Ecology nerds were quickly thick as thieves and both visits ended on a collaborative note between students and banders as well as a few new volunteers already signed up for next year. We hope to see more in the future!





*The banding team with a few volunteers, both local and out-of-town, and the UNBC students coming up for the weekend
(Photo: Lucile Jacques)*

On September 21st, the Grade 3 class of Morfee Elementary School came on a field trip, followed by the Grade 4/5 class of the same school on the 25th of September. 53 children aged 8 to 11 were delighted to see birds up close and accompanied us to the nets with great enthusiasm. Their happiness, questions and eager thanks were well worth the mess and noise!



*Banders Laura and Kirstin with the gorgeous thank-you card from the Morfee Elementary students
(Photos: Lucile Jacques)*

Two homeschooled classes visited the station in September after meeting us at the Thursday Community Market. One of them came for passerines, while the other attended an owl visitor night. Both groups enjoyed their visit and one of them adopted an owl in the name of the school.

On top of that, special visitor nights were organized during owling season and were immensely successful. More on that in the section Non-standard Banding -- Owls.

MNO BANDING REPORT 2023

*By Laura Tabbakh and
Kirstin Laviolette Lachance*

Standard Banding

(Appendices 1 & 2)

In 2023, standard banding occurred as usual between July 19 and September 23 (67 days). Additional non-standard banding was also conducted between September 24 and September 30 as a pilot project to possibly extend the banding season until September 30 on a permanent basis.

Overview

During our standard period, using our standard nets, a total of 2799 birds were banded of 62 species, making 2023 MNO's 14th most productive year. Notable events included:

- The station's first ever **Broad-winged Hawk** banded as a third-year bird of undetermined sex caught on September 5th.
- The station's 6th **Cape May Warbler** ever banded, a hatch year bird caught on August 22nd.
- The station's second **Mourning Warbler** ever banded, a hatch year bird caught on August 4th.
- The station's 5th **Rose-breasted Grosbeak** banded on July 20th.
- The station's 3rd **European Starling**, a hatch year male banded on August 2nd.
- Two swallows banded: a hatch year **Tree Swallow** on August 26th and a hatch year **Barn Swallow** on the 28th of July.
- Two hatch year **Pacific Wrens** banded on August 3rd and September 20th.
- 213 **Golden-crowned Kinglets** banded! The previous record was 132 in 2019.
- Only 4 **Cedar Waxwings** banded.

- **American Tree, Lincoln's and White-throated Sparrows** were well under average.

- 17 **Ovenbirds** banded (average is 5)
- A very exciting 6 **Black-and-white Warblers** banded, including two adult males and a fledgling. The breeding female banded last year was also recaptured, making her arguably the most note-worthy bird of the season.

- An overall poor year for warblers, with 10 out of 18 species under average captures.

The top 12 species banded for 2023 were:

1. Ruby-crowned Kinglet (334)
2. Swainson's Thrush (273)
3. American Redstart (256)
4. Golden-crowned Kinglet (213)
5. Dark-eyed Junco (171)
6. Wilson's Warbler (147)
7. Yellow-rumped Warbler (139)
8. Orange-crowned Warbler (138)
9. Magnolia Warbler (109)
10. Alder Flycatcher (104)
11. Northern Waterthrush (78)
12. Yellow Warbler (78)

Notable misses included **Sharp-shinned Hawk, Downy** and **Hairy Woodpecker**, and **Pine Siskin**.



We loved our busy mornings! Here's to many more. (Photo: Lucile Jacques)



12. Yellow Warbler



Ruby-crowned Kinglet



2. Swainson's Thrush



11. Northern Waterthrush



3. American Redstart



10. Alder Flycatcher

Top 12 species banded at Mugaha Marsh 2023



4. Golden-crowned Kinglet



9. Magnolia Warbler



5. Dark-eyed Junco



8. Orange-crowned Warbler



7. Yellow-rumped Warbler



6. Wilson's Warbler

Weather

The weather this year was much cooler overall than previous years especially compared to 2022 where we had high 20's well into September. Thankfully, we missed no full days to rain or wind this year – although we did have to close the nets early a couple days due to smoke from the Williston fires.

July was cool, with the temperature never reaching 20° C during banding hours. This month had an average opening temperature of 10.6°C and an average closing temperature of 17.6°C.

August had some hotter days, but overall followed this cooler trend with an average opening temperature of 10.0°C and an average closing temperature of 19.4°C. The temperature only hit 20°C for 12 days this month, surprisingly.

September was cold this year, with the average opening temperature being 5.4°C and the average closing temperature of 15.6°C.

Exception was three outlying days where the temperature shot up drastically from opening to closing, these being; September 10th, 15th, and 22nd which all started off below 5°C and ended above 20°C.

Our coldest day this year was the last day of Standard Banding, September 23rd, with an opening temperature of 0.5°C. Most of our nets were frozen shut that day, not surprisingly.

Banding effort

12 mist nets were used in Standard Banding this season: nets #32, 25, 26, 3, 9, 11, 12, 17, 19, 20, 21 and 22. This is the 10th year we have used this set of nets (see Appendix 4).

The weasels became a problem again this year, as of August; so the nets were again raised higher from the ground than optimal.

Overall, we managed a total of 4547.75 standard net-hours this year, compared to the average of 4219.05 net-hours for 1995 – 2022. This is our 6th highest effort year, and does not include our non-standard hours.



Standard Banding Results

Non-passerines

Hawks – Accipitriformes, Accipitridae

Surprisingly, we didn't catch a single **Sharp-shinned Hawk** in our standard nets this year. However, we did catch a beautiful Buteo: a **Broad-winged Hawk**! It was a first-ever for the station, which was very exciting for everyone involved. It was a team effort to band this bird seeing as they take special lock-on bands. The last new species was a Gray Catbird in 2019.



Broad-winged Hawk (Photo: Laura Tabbakh)

Woodpeckers - Piciformes, Picidae

Woodpeckers were lacking this year in our nets, except for the sapsuckers! We caught **7 Red-breasted Sapsuckers**, which is a record-year for them; much higher than their average of 1.



*Red-breasted Sapsucker, after hatch year
(Photo: Kirstin Lachance)*

We also caught **6 Yellow-bellied Sapsuckers**, not the most caught in a season, but higher than the average of 5; as well as **2 hybrids**, which is right on average for them.



*Yellow-bellied Sapsucker, hatch year
(Photo: Laura Tabbakh)*

We didn't catch a single **Downy**, **Hairy**, or **Pileated Woodpecker**, although we heard lots during census and observations ("obs") throughout the season.

Flickers were also much less than usual with only 2 banded: **1 Northern Flicker Intergrade** and **1 Red-shafted Flicker** which is the western subspecies, and only the 9th ever banded, and the first in 10 years! We didn't catch any Yellow-shafted like the one from last year, however.



*Red-shafted Flicker, after third year
(Photo: Lucile Jacques)*

Passerines

Flycatchers - Tyrannidae

Flycatchers were popular once again this year. We caught **104 Alder Flycatcher**, more than their average of 88. We also caught a **Traill's Flycatcher**, which Laura and Kirstin highly suspected to be a Willow, but they went with Traill's to be safe; this is only the 3rd for the station.



Alder Flycatcher (Photo: Laura Tabbakh)

Least Flycatchers were on the low side, however, with only **71** caught, compared to the average of 83.



*Least Flycatcher, hatch year
(Photo: Laura Tabbakh)*

Dusky Flycatcher had a good year compared to most years, with **46** banded, a third higher than the average of 31. **Hammond's Flycatcher** had the same number banded as Dusky (46), which is right near par for them.



*Dusky Flycatcher, hatch year
(Photo: Laura Tabbakh)*



*Hammond's Flycatcher, hatch year
(Photo: Laura Tabbakh)*

Yellow-bellied Flycatcher had a relatively average year, with **5** banded, slightly higher than the average of 4. This year also brought **2 Western** (formerly **Pacific-Slope**) **Flycatcher**.



*Yellow-bellied Flycatcher
(Photo: Lucile Jacques)*

Western Wood-Pewee made more of an appearance this year than in the previous 6 years. We heard them daily throughout all of July and August and caught **2** in our standard nets. This is still lower than the average of 4, but the station hasn't banded more than 3 in a season since 2008, and didn't band one for multiple seasons, so the team was happy to catch the two they kept hearing!



*Western Wood-, adult female
(Photo: Laura Tabbakh)*

Finally, a family of **Eastern Kingbirds** was on site this year. We caught **4** which was most of them, and much higher than the average of less than 1 per season, and better than the 2 we caught last year!



*Eastern Kingbird, hatch year
(Photo: Laura Tabbakh)*

Vireos - Vireonidae

Vireos had a relatively normal year, nothing drastic in numbers. The **Cassin's Vireo** had half the average with only **2** banded, **Blue-headed Vireos** were slightly higher than average with **1** banded, which still caused some excitement since they are not caught every year.



Blue-headed Vireo (Photo: Lucile Jacques)



Cassin's Vireo (Photo: Laura Tabbakh)

Red-eyed Vireo were right around average with **3** banded (4).



*Red-eyed Vireo, hatch year
(Photo: Laura Tabbakh)*

Last but definitely not least, **Warbling Vireo** had a slightly better year than average with **57** banded (average 54).



Warbling Vireo (Photo: Laura Tabbakh)

Swallows - Hirundinidae

It was another lucky year for swallows! We caught 2 different species: **1 Barn Swallow** and **1 Tree Swallow**. Granted it was less exciting than last year's record 11 swallows of 4 different species but still very fun for Ben and Kirstin who both had never banded swallows before.



*Barn Swallow, hatch year
(Photo: Lucile Jacques)*



*Tree Swallow, hatch year
(Picture: Ben Breton)*

Chickadees – Paridae

We caught a good number of **Black-capped Chickadee** this year, coming in at 32, however well under average (38). They hung around the station a lot this year though, as we kept catching the ones we had already banded this season.



*Black-capped Chickadee
(Photo: Kirstin Lachance)*

Nuthatches – Sittidae

It was a more normal year, if slightly on the lower end, for **Red-breasted Nuthatch**, with only **5** caught, compared to last year's wild 15 and the average of 8.



*Red-breasted Nuthatch, hatch year
(Photo: Kirstin Lachance)*

Wrens - Troglodytidae

Very excitingly, we caught **2 Pacific Wren** this year! The last one caught was in 2018, and this brings the total for the station to 12. They were caught at the beginning and end of the season, both times in the same net, and both times were unexpected as we barely heard them at all this season!



Pacific Wren, hatch year
(Photo: Lucile Jacques)

Kinglets - Regulidae

The **Ruby-crowned Kinglet** didn't have a blowout season this year; however, we did catch more than last year. They ended the standard season at **334** banded, lower than the average of 384, but we were happy to see they did better than the small number of only 206 caught last year.



Ruby-crowned Kinglet, male
(Photo: Lucile Jacques)

The **Golden-crowned Kinglet**, for the most part, did substantially better than usual with **213** banded, compared to their modest average of 65! Prior to this year, the most Golden-crowns ever banded in a season was 132, back in 2019.



Golden-crowned Kinglet
(Photo: Laura Tabbakh)

Not surprisingly, both Ruby-crowns and Golden-crowns made it onto our top 12 this year. Ruby-crowned Kinglets got #1 place and Golden-crowned Kinglets got #4, which is quite the feat, as they often don't even make it to the top 12.

Thrushes - Turdidae

It seems that it was the year of the thrush! **Swainson's Thrush** placed 2nd for most banded bird, with **273** banded, almost double the average (142) and the 3rd highest catch since MNO opened in 1995!



Swainson's Thrush, hatch year
(Photo: Lucile Jacques)

American Robin and **Varied Thrush** also had a higher-than-average year with **24** and **7** banded, respectively, compared to the averages of 17 and 3.



*American Robin (hatch year)
(Photo: Laura Tabbakh)*



*Hermit Thrush, hatch year (note the shaft streaks)
(Photo: Laura Tabbakh)*



*Varied Thrush
(Photo: Lucile Jacques)*

For their part, **Hermit** and **Gray-cheeked Thrushes** both had a slightly lower-than-average year: we banded **14** Hermit Thrushes (average of 18) and only **1** Gray-cheeked Thrush (average of 2).



Grey-cheeked Thrush (Photo: Laura Tabbakh)

Waxwings - Bombycillidae

Cedar Waxwing almost had a record-low this year, with only **4** banded, compared to the average of 22 per season! No **Bohemian Waxwings** were banded this season, but we did have some on obs! More on that in the next section...



Cedar Waxwing (hatch year)
(Photo: Lucile Jacques)

Sparrows- Passerellidae

Sparrows had a mixed year for abundance, but very good diversity, as usual! **Clay-colored**, **Chipping**, **Golden-crowned**, **Gambel's** **White-crowned**, **Savannah Sparrows** and **Dark-eyed Juncos** all had an above-average year.

Chipping and Golden-crowned Sparrows and the juncos were especially high, with **50**, **4**, and **171** banded compared to the averages of 12, less than 1, and 124, respectively. Dark-eyed Juncos made it to spot #5 of our top 12 this year, and just the Oregon subspecies would have made it to #7, but they get lumped together since they aren't separate species.



Chipping Sparrow (photo: Lucile Jacques)



Golden-crowned Sparrow
(photo: Kirstin Lachance)



Oregon Junco (photo: Laura Tabbakh)

Clay-colored Sparrow had **10** banded which is very high for them, considering we only banded 2 last year and none the previous year (average of 4). White-crowned Sparrow (all Gambel's subspecies) came in with **59** banded (average is 33) and Savannah Sparrow had **23** banded, slightly higher than the average of 21. They also showed up quite early, in mid-August.



Clay-colored Sparrow (photo: Laura Tabbakh)



Gambell's White-crowned Sparrow (photo: Kirstin Lachance)



Savannah Sparrow (photo: Laura Tabbakh)



American Tree Sparrow (photo: Kirstin Lachance)



Song Sparrow (following photos: Laura Tabbakh)



Lincoln's Sparrow



White-throated Sparrow

The sparrows that ended well-under the average were **American Tree** with **3** banded (average 8), **Song** with **14** banded (29), **Lincoln's** with **24** banded (42), and **White-throated Sparrows** with **28** banded (44). Lincoln's and White-throated Sparrows really had us missing them this year; we don't know where they went!

The sparrows that were right on average included **Swamp Sparrow** with **7** banded and **Fox Sparrow** with **4** banded (average of 7 and 5, respectively).

Cardinals, Grosbeaks, Buntings – Cardinalidae

Our eastern banders thought they were hearing things when they heard a **Rose-breasted Grosbeak** singing two days in a row. They thought it just must be an American Robin playing tricks on them, but then Kirstin saw the singing male in a tree! We were still recovering from that exciting news when, a couple rounds after she saw the adult singing male, we caught a young male in a net! This was only the 5th ever caught at the station, so it was a very exciting day for all.



Rose-breasted Grosbeak, hatch year
(Photo: Laura Tabbakh)



Brown-headed Cowbird, hatch year
(Photo: Lucile Jacques)

Western Tanagers had a very good season compared to usual, with **40** birds banded, compared to the average of 18. We even caught a whole family in one net round so our junior bander Ben got to really see the comparison between young and adult, as well as male and female.



Western Tanagers (Photo: Lucile Jacques)

Blackbirds - Icteridae

A few blackbirds made an appearance this year. Red-winged Blackbirds were scarce and none were caught, but we did band a hatch year **Brown-headed Cowbird**. The average for them is 2 but the last time one was caught here was 2018! It was also a hatch year.

Finches – Fringillidae

We didn't catch many finches this year, only **6 Purple Finches**, which is on average (5). They were all caught within the first 3 weeks of the season.



Purple Finch, adult male
(Photo: Laura Tabbakh)

We didn't catch a single **Pine Siskin** this year! Everyone was very disappointed to not have our usual fallout of siskins at the end of the season. The yearly average for siskins is 139! Although we constantly saw flocks of hundreds, they just never came down into our nets. This is only the second year ever that the station hasn't caught any siskin, the other being in 2021.

Wood Warblers – Parulidae

Surprisingly, warblers this season were consistently lower than usual. Only 8 of our 18 species were above average this year, and not by much!

However, they still did make up the majority of our top 12 list. **American Redstart** came in at #3 with **256** banded (that's right, they lost to Swainson's Thrush!), a few under the average (263).

Wilson's Warbler made it to #6 this year, with **147** banded, way over the average of 86!

Next is **Orange-crowned Warbler** at #7 with **138** banded, more than we banded last year, but they still fell under the average of 155.

Yellow-rumped Warbler made it to #7, not surprisingly, with 2 possible subspecies and the hybridization to help! The eastern subspecies, **Myrtle Warbler**, had **49** banded this year, well above the average of 18. The western subspecies, **Audubon's Warbler**, had only **7** banded, drastically lower than the average of 38, although better than last year when none were caught. The **Unknown Yellow-rumped Warbler** designation is used for either hybrids of the Myrtle and Audubon's subspecies or birds too young to identify to subspecies. We banded **83** of them, slightly above the average of 73.

Magnolia Warbler came in at #9 with **109** banded, a good number above the average of 79. However this number was slightly lower than the previous two years.



American Redstart
(photo: Kirstin Lachance)



Wilson's Warbler
(photo: Lucile Jacques)



Orange-crowned Warbler
(photo: Laura Tabbakh)



Unknown Yellow-rumped Warbler (Lucile Jacques)

Northern Waterthrush also made it on our Top 12 list at #11 with **78** banded, which is drastically lower than the average of 168, but seems to be on par with the trend the past few years, excluding the jump to 152 in 2021.

We banded **78 Yellow Warblers** this year, also less than the average of 98, but in the same range as the past five years.

Tennessee Warbler continues to decline, with only 10 banded this year, as opposed to the average of 51.



Magnolia Warbler
(photo: Lucile Jacques)



Northern Waterthrush
(photo: Lucile Jacques)



Common Yellowthroat
(photo: Laura Tabbakh)



Blackpoll Warbler
(photo: Lucile Jacques)



Yellow Warbler
(photo: Laura Tabbakh)



Tennessee Warbler
(Laura Tabbakh)



MacGillivray's Warbler
(photo: Lucile Jacques)



Townsend's Warbler
(Laura Tabbakh)

Common Yellowthroats were also well under the average of 137 and the totals for the last two years, with only **64** banded this year; we also stopped noticing them quite early in the season.

Blackpoll, **MacGillivray's**, and **Townsend's Warblers** were all slightly under their averages, but are remaining relatively constant for the past few years. Blackpoll Warbler ended the season at **11** banded, MacGillivray's at **14**, and Townsend's at **10**, with averages being 25, 23, and 14, respectively.

Finally, we have the exciting warblers for this year! We caught two very cool warblers this year: a **Cape May Warbler** and a **Mourning Warbler**.

Both of them stumped us for a second. All three eastern banders saw the Mourning Warbler and immediately identified it, but then puzzled over it for a good while because the species is out of range at the station! A very cool bird indeed, and only the second ever for the station.



*Hatch year Mourning Warbler looking scruffy from the heavy on-going moult
(Photo: Laura Tabbakh)*

The Cape May Warbler was also a slight puzzle. They are also out of range, and that bird came mixed in with several Townsend's Warblers, which, when young, can look similar to the Cape May. It was quickly decided that we did indeed have a Cape May Warbler, bringing the total number for the station to 6!



*Cape May Warbler
(Photo: Kirstin Lachance)*

Ovenbirds had a spectacular year with **17** banded, more than three times the average of 5. We're looking forward to seeing if they'll continue this upward trend they started last year.



Ovenbird (Photo: Kirstin Lachance)



Net lane (Photo Laird Law)

Saving the best of warblers for last! **Black-and-white Warbler** had another great year with **6** banded, the same number as last year! This brings the total banded at the station to 16. Before 2022, the station had only ever banded 4 in its 27 years of operation!

The Black-and-white Warblers banded this year were hatch year birds, as well as two breeding males, meaning we had two separate families breeding in the area. The banders also deduced they must have been breeding close to the station because one of the birds caught was actually a local bird, i.e. it was barely out of the nest, still in complete down and growing in its juvenile plumage.



Black-and-white Warbler
(Photo: Laura Tabbakh)

Sturnidae - Starlings

We caught an exciting first for the team: a **European Starling**! You wouldn't think banders/birders would be happy to see the invasive starling, but they simply couldn't get over the excitement of having a rare bird for the area, and who can blame them? This was only the 3rd ever caught for the station and was a young male just starting its formative moult.



European Starling (hatch year)
Photo: (Laura Tabbakh)

Recaptures

Recaptures are birds that have already been banded and are caught again. MNO had 336 recaptures this year in Standard and Non-standard Banding.

There are three types of recaptures encountered at a banding station: Foreign Recaptures, Returns, and Repeats.

A **Foreign Recapture** is a bird that was banded at one station and recovered at another station. It is a rather rare occurrence, as birds tend to use the same migration routes and the same breeding and stopover sites year after year, making it unlikely to be caught elsewhere. A foreign recapture is always cause for much excitement, and we (sadly, but as expected) did not get any during our banding this year; neither did we hear of any bird banded at Mugaha getting caught at another station.

The second type of recapture, and by far the most frequent, is called a **Repeat**: birds that are recaptured at the same station in the same season they were initially banded. This happens often when birds choose a site to breed, or to stop over in order to build fat reserves to continue their migration. In that case, the birds spend a long period of time around the station, making it more likely to get caught several times during the same season.

The third type of recapture is **Returns**: birds banded in a previous season and then recaptured any season afterwards. Although less exciting than foreign recaptures, returns are the most interesting recaptures for us, as they teach us about site fidelity and bird longevity. Most of 44 returning birds this year were initially banded between 2019 and 2022. This is near the average for returns

(46) each year. We had several notable returns this year. See Appendices 5, 6 and 7.



This Yellow Warbler (#2780-82191) was first banded in 2017 as a hatch year of undetermined sex. She went undetected for five years until we caught her again in 2022, and then four times in 2023! Yellow Warblers often make the list of long-lived returns, and at six years old, this one sure fits the pattern.



This White-throated Sparrow (#2771-82373) was initially caught in 2019, and was already at least one years old back then, which makes her at least five years old. She also managed to dodge our nets until this year!



We first netted this Orange-crowned Warbler (#2860-09448) in 2019 as an after-hatch year, making her at least five this year. She was caught for a second time in 2019, then in 2021, 2022, and two times this year. Someone get her an MNO loyalty card already!



Ruby-crowned Kinglets may be tiny, but they are hardy! This handsome fellow (#2790-68063) was first banded as an after-hatch year in 2018, making him at least six years old. Not bad for a six-gram bird! He was caught a second time in 2018 and once in 2021.



Here's our record-breaker for the year! This beautiful Western Tanager (#2691-72075) was first banded in 2014 as a hatch year bird, which makes her nine years old this year! What's even more amazing is that she was never recaptured before this year, which makes us wonder: was she here every year evading our captures, or did she try other sites?



We banded this Orange-crowned Warbler (#2780-83346) in 2018 as an after-hatch year. He is at least six years old and also managed to dodge our nets all this time.



This Swainson's Thrush (#2741-77863) was first banded in 2018 as an after-hatch year. He was never caught in those six years until he showed up in our nets this August with a

whooping fat score of 7! Those old birds know how to do migration...



Last but certainly not least, we recaptured one of the Black-and-white Warblers we banded last year. Even more exciting, it was the breeding female of the group (#2950-41012)! We hope to catch her again next year.



Non-Standard Banding - Passerines

(Appendix 3)

Non-standard nets

Four non-standard nets were reopened this year: nets #13, 14, 15 and 16. Those nets had been used from 1996 up to and including 2001, after which regular flooding prevented their use. They were reopened this year with the hope of eventually adding them to our standard net list.

These nets are located on the west side of the road. This section of the station is in the marsh where the vegetation is now mainly young willows and poplars; the ground was dry.

These non-standard nets caught 387 birds of 40 species, accounting for 12.7% of our total catch for 2023. The main species caught were Ruby-crowned Kinglet (72); Golden-crowned Kinglet (38); Yellow-rumped Warbler (55); and American Redstart (30). Twenty of these birds were later recaptured in Standard Nets.

It is worth noting the non-standard nets caught our only Sharp-shinned Hawk of the season, an After Third Year bird.



Sharp-shinned Hawk (Photo: Laura Tabbakh)

These nets were open for 287 hours in July, 724 hours in August, and 450.5 hours in September, for a total of 1461.5 hours during the standard time period.

Overall, this season was a promising one for these four nets. Although the Ruby-crowned Kinglets and Yellow-rumped Warblers didn't show up in numbers until September, it was well worth it and it will be interesting to see how they do next year.

Non-standard Banding Week

This year was the first year of a trial period of the station monitoring migration until September 30. We managed 616.5 net hours in that extra week for the 16 nets. Average opening temperature was 5.4°C and average closing temperature was 11.8°C. Weather was overall cooperative, with only 55.5 hours lost to rain.

This last week was quiet banding-wise (66 birds of 12 species), but observations and census were average, with the lowest daily species count of 21 species and highest of 32 species.

Notable birds observed during this non-standard week included **Snow** and **Greater White-fronted Geese**, as well as two **Townsend's Solitaires**, all seen on September 29th. It was the first time of the season that we saw these two species of geese, and the second time we spotted Townsend's Solitaires. We also banded a **Western-Palm Warbler** on September 29th, the 7th ever caught at MNO.



Western Palm Warbler (Photo: Laura Tabbakh)

This is a positive first try at ensuring the station does not miss the end of migration. However, migration for many species appeared to be earlier than usual this year, which might have caused an early end as well. We're curious to discover what next year holds us.

Non-standard Banding – Owls

(in Appendix 3)

In 2023, we continued our Non-standard Banding program for **Northern Saw-whet Owls**.

This year's owl banding program was again run by our AB #1 Kirstin Lachance. Kirstin, Ben, and Laura, as well as multiple

dedicated volunteers, banded 20 nights from August 31st to the closing day of September 30th. Several nights with heavy rain or intense smoke forced them to get an early night's rest.

Nets were opened one hour after sunset and stayed open for two hours each night of suitable weather, sometimes going longer for visitor nights or if it was an especially productive night.

The total effort this season was 356.5 hours with a total of **64 Northern Saw-whet Owls** banded. No Boreal Owls were caught, which was to be expected as we only played the call for a total of 12 hours this season, as of September 13th, when we heard one calling behind the station. A Northern Pygmy-Owl was seen on September 10th! Sadly, we didn't catch it.

New net lanes were set up this year, in preparation for next year's (hopeful) implementation of a standardized owl banding program, which Kirstin has been writing during the season.

At the beginning of the season, 11 nets were used, including some of the ones from last season. Nets # 5, 30, 35, 37, and 38 were used until September 10th, after which they were retired. The other nets were placed in new net lanes opened this year, numbered as #39, 40 and ON #1 to 6 (See Figure 1 for a map of labelled net lanes).

The placement of these new nets and the retirement of the old ones were decided based on the preferred habitat of the Northern Saw-whet Owls. The old net lanes were in areas in which the habitat has changed into something less likely to be used by the owls. Net #38 was destroyed by (probably) a Great-horned Owl flying through it on September 5th. It was not

replaced with another old passerine net for the rest of the season as the other seven nets being used had a high-enough catch rate and we didn't want to risk another broken net.

The new net lane #40 was also retired after September 10th, as it wasn't catching and we never heard owls near it.



*Figure 1: Location of owl nets in 2023
(Map: Kirstin Lachance)*

The two new triangles ON 1-3 and ON 4-6 proved very fruitful and to be good placements, as they caught most of the owls. The north triangle (ON 1-3) caught a total of 20 owls, and the south triangle (ON 4-6) caught 40, with nets #37 & 39 having caught 1 and 3 owls, respectively. Owl net #ON4 was broken on September 29th by a Northern Flying Squirrel. It was very exciting to have caught one, although Kirstin was quite devastated to lose another net (and an actual owl net, at that!).

We conducted ten visitor nights this year, compared to the three we held last year. Two nights were dedicated to the UNBC students, and eight to the public. The event was so popular we had to open two more nights than originally planned!



*Owls make everyone happy!
(Photo: Natalie Srochenski)*



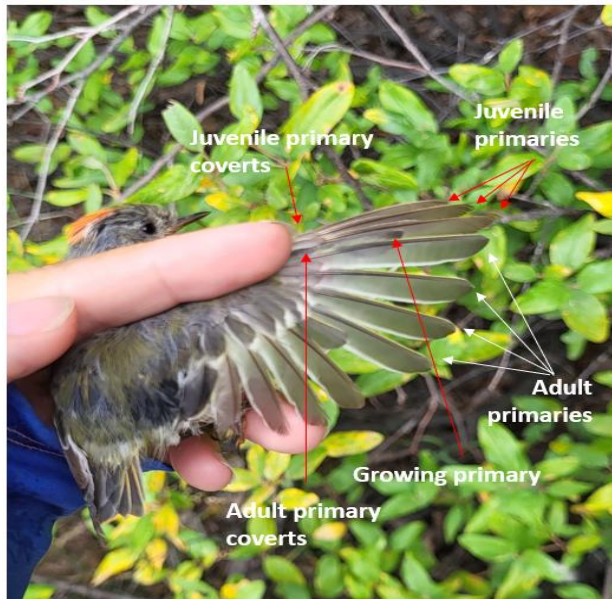
Volunteer Kalum with a Northern Saw-whet Owl (Photo: Natalie Srochenski)

During the visitor nights, any owl caught was offered for sponsorship by the public. Very soon, every owl caught was adopted, adding to the success of these events. We hope to hold many more next year!

Interesting Birds and Bird Facts

Moult

We are often asked how we age birds. Luckily for us, birds moult their feathers on a schedule that varies from family to family, and sometimes from species to species. We call this “moult strategy.” It then becomes a matter of knowing those moult strategies and identifying old, retained (not replaced) feathers and newly grown ones, and then deciding if the old feathers are the ones the bird had as a juvenile bird, or as an adult. We usually look at moult patterns in the wing. Of course, it’s not always that simple, but here is a great example:



Ruby-crowned Kinglet displaying second-year wing moult (Photo: Kirstin Lachance)

This is a male Ruby-crowned Kinglet. He was in the middle of his moult when we caught him. In this picture, we are looking at two types on feathers in the wing: the primaries (the nine outer wing feathers) and the primary coverts (the smaller feathers covering the base of the primaries).

Notice three types of feathers in the wing. First, the three juvenile primaries: notice

how thin, brown and frayed those are. Second, the four newly grown adult primaries: notice how broad, solid, and black they look. And third, the two fresh feathers still growing, to eventually become the same as the four adult primaries.

Same goes for the primary coverts: the newly replaced ones, growing on the top of the newly replaced primaries, are also broader and blacker than the three retained juvenile primary coverts covering the three retained juvenile primaries, which look browner and thinner.

With this information in hand, we can tell this bird is an adult bird. Kinglets do not replace their primaries in their first summer (as juvenile birds); they only start doing so in their second summer, then every summer after that.

We can go even further than that. The retained primaries are clearly the juvenile feathers, i.e. the ones this bird had during his first summer. Because he will have replaced all of them by the end of his second summer, we can tell this bird is one years old.

We can take it one step further: had the three retained primaries *not* been juveniles, but simply adult primaries that had not been replaced yet, we could have said this bird was at least two years old, as all the juvenile feathers would have been replaced in previous years. That would make him an After Second Year bird.

This is about as precise as we can get with passerines, as most of them moult all their feathers every summer. Other families, such as woodpeckers and raptors, can be aged more precisely, as they only replace a few wing feathers every year and can show up to six generations of feathers, depending on the species.

Plumage abnormalities: colouration

Just like mammals, birds can have coloration abnormalities such as melanism (an excessive amount of dark pigments) or leucism (a lack of dark pigments leading to a much paler appearance). Both are genetic conditions that usually do not affect the animal at all. While it's not as straightforward to just label an animal melanistic or leucistic, we can have strong suspicions.

This bird is, would you believe it, a hatch year Warbling Vireo. The flanks of this species are usually washed white, but can indeed sometimes be snow-white like this bird. However, the head and nape are supposed to be dark grey instead of that yellow, white, and patchy grey pattern. Notice also the yellow (instead of grey) bill.



Warbling Vireo displaying an unusually white plumage (Photo: Lucile Jacques)

The following picture is what a Warbling Vireo usually looks like. Notice the grey head and bill, and the yellow wash on the chest.



Warbling Vireo displaying normal colors (Photo: Laura Tabbakh)

Our maybe-leucistic bird was so lacking in dark pigments even the claws were all white!



White claws seen on an unusually pale Warbling Vireo (Photo: Lucile Jacques)

Another interesting fact is that we had caught another hatch year Warbling Vireo displaying an abnormally pale plumage a week prior (see below).



*Unusually pale hatch year Warbling Vireo
(Photo: Lucile Jacques)*

While this bird is not as dramatic as the first one, you will notice how the head shows the same scalloped pattern.

Now for the real fun part: both birds were caught in the same net, six days apart. With the same genetic displays, we suspect they are siblings, and we can't help wondering what the parents look like. We sure would have loved to catch an adult looking like that!

Plumage abnormalities: fault bars

An oldie, but a goodie. Fault bars usually show up in the tail of birds when food quality varies.

Depending on the quality of the food the bird receives while growing feathers, the feathers grow of more or less good quality. Periods of poor nutrition will make a portion of the feather pale and more fragile (poor quality), whereas periods of good nutrition will make a portion of that same feather of darker in color and more solid (good quality). The visible limit in the feather is called a fault bar. The picture below shows a very obvious fault bar in the tail.



*Fault bar in the tail of hatch year
Common Yellowthroat
(Photo: Natalie Srochenski)*

Fault bars are one of the many tools used to age a bird. When all the feathers of the tail have the same fault bar going across, it tells us all the feathers grew at the same time, which indicates a hatch year bird. Adult birds grow their tail a few feathers at a time. A fault bar on an adult tail would either affect only some feathers, or be scattered up and down different feathers as they each grew at different times.



12. Wilson's Warbler



1. Ruby-crowned Kinglet



2. American Redstart



11. Alder Flycatcher



3. Northern Waterthrush



10. Yellow Warbler

Top **12** species banded at Mugaha Marsh

1995 - 2023



4. Orange-crowned Warbler



9. Dark-eyed Junco



5. Swainson's Thrush



8. Yellow-rumped Warbler



7. Pine Siskin



6. Common Yellowthroat

CENSUS AND OBSERVATIONS AT THE BANDING STATION

by Laura Tabbakh

Migration monitoring is not all about banding. A large section of the data comes from daily observations, or, as we call them, “Obs.” During banding hours, we recorded all birds seen or heard within the station’s perimeter: these are the standard observations. Non-standard observations also took place occasionally outside of banding hours. We also conducted a one-hour census daily. Census sightings are included in this section.

Swans, Geese and Ducks

Trumpeter Swans came early this year: mid-August! They usually came through in pairs, but we saw six of them at once one morning in mid-September, which was a real treat.



Trumpeter Swans (Photo: Lucile Jacques)

We had three species of geese come to the station this year. **Canada Geese** were the most common, but we did get **Snow Geese** and **Greater White-Fronted Geese** during our non-standard week (29th of September). Several Canada Geese spent a few days at the station, but the large majority were seen migrating to and from the reservoir.

Ducks gave us a real test of our ID skills and patience this year... **Mallards** were present throughout the whole summer. Large rafts of **American Wigeon** showed up from mid-August to the end of September. During their migration peak, we would have a couple hundred living in the marsh. **Northern Pintail** came about the same time, and we became very skilled at telling a wigeon butt from a pintail butt. They were often mixed with a few **Blue-winged** and **American Green-winged Teal**. **Bufflehead** were seen almost daily until mid-August. We had a few sightings of **Ring-necked Duck**, **Barrow’s** and **Common Goldeneye**, **Common** and **Hooded Merganser**, **Northern Shoveler** and **Lesser and Greater Scaup**.

Upland Game Birds

As usual, the most commonly encountered upland game birds this year were the **Ruffed Grouse**. We even caught two of them a few days apart, once in net 9 and once in net 26. We cannot band Ruffed Grouse because they are game birds, but it was a fun catch for banders and volunteers, and it was a real treat to see their gorgeous plumage up close.



Ruffed Grouse (Photo: Laura Tabbakh)

Spruce Grouse were spotted a few times, down the road past the double nets – right at the limits of the station.

Hawks and Eagles

Each summer, we have a family of **Osprey** around the station, and this year was no exception. We will hear the young ones' begging calls in our dreams for a long time to come... We also had a few migrating Ospreys end of September.

We had several sightings of **Bald Eagles**, young ones and adults. All were just passing through and were not even seen two days in a row.



Juvenile Bald Eagle
(Photo: Kirstin Lachance)

Sharp-shinned Hawks were by far the hawk most often spotted, but we did have a few sightings of **Cooper's Hawks** as well. **Northern Harriers** were at the marsh as usual, although we had less than the previous years and not many stayed long. More exciting were three sightings of **Northern Goshawks** and a few **Broad-winged Hawks**, both species just migrating through.

Last but not least, we had a few **Red-tailed Hawks** come through, one of which was rather vocal and territorial one morning of September.

Loons, Grebes and Coots

Common Loons were seen and/or heard almost daily from day one to our very last day. Many spent days, if not weeks, in the small pond by the station.

We saw no coots this year, but **Red-necked Grebes** were frequent, and, again, many stayed over for a while.

Heron and Cranes

Great Blue Heron were seen only a few times and they did not seem interested in spending time at the station.

Sandhill Cranes were seen and heard daily until early September – so much so that a Common Raven started imitating them (and the Trumpeter Swans).

Shorebirds

A worse ID nightmare than the ducks were the shorebirds. Because the summer was so dry, the marsh receded much farther than usual. The shorebirds took to using the mudflats at the far end of the marsh, which made the (already difficult) ID exercise all that harder.

Despite all that and with great help from our volunteers who are more familiar with the shorebirds of the area, our team was able to spot a large number of **Lesser** and **Greater Yellowlegs**, many of which spent a week or more feeding in the mudflats before moving on. Another species that came in high numbers for prolonged stays was the **Long-billed Dowitcher**. We also had **Killdeer**, **Wilson's Snipe**, **Semi-palmated Plover**, as well as **Pectoral**, **Stilt**, **Baird's**, **Least**, **Spotted**, and **Solitary Sandpipers**.



Lesser Yellowlegs (Photo: Lucile Jacques)

Gulls

We did not get many gulls this year. Some **Ring-billed Gulls** showed up, clearly just passing through. A few **Bonaparte's Gulls** spent some days in the marsh, and we had a few sightings of **Herring Gulls**. A **California Gull** made for a bit of a challenge and excitement in August, but it was the only one to come through.

Phalaropes

Both **Red-necked** and **Wilson's Phalaropes** were seen at the station until the third week of August, most of which spent a few days in the marsh.

Terns

Before the season even started, the team was quite surprised to spot a **Caspian Tern**, soon to be two Caspian Terns. At some point in August, four were seen at the same time. A pair of them, affectionately called Cate and Harold, spent a few weeks at the station before disappearing altogether around the third week of August.

Owls

As usual, the team heard **Great-horned** and **Barred Owls** early in the season until the end. We strongly suspect one of each destroyed two nets during owling.

Northern Saw-whet Owls were sometimes heard during owling nights, and bander

Kirstin swears she spotted a **Northern Pygmy Owl** one night on her way to open owl nets.

Goatsuckers

Common Nighthawks were heard *peenting* and seen hunting early in the season until about mid-August. On one memorable occasion, the banders spotted seven of them hunting at once while they were having a lunch of their own!

Hummingbirds

Rufous and **Calliope Hummingbirds** were both seen at the station, and often caught in our nets. Although we cannot band them as we have nobody with the required permits, it was always a delight to remove those little jewels from the nets and bring them back to allow everyone a close look at their beauty.



*Calliope Hummingbird
(Photo: Lucile Jacques)*

Kingfishers

Several **Belted Kingfishers** were present at the station from the beginning to the very end of the season. They all spent some time in the area before moving on.

Woodpeckers

It was a relatively quiet year for woodpeckers. We saw a few **Downy** and **Hairy Woodpeckers**. More often spotted were **Yellow-bellied** and **Red-breasted Sapsuckers**.

Of course, many, many **Northern Flickers** were seen and heard; one **Red-shafted Flicker** became well-known to our team.

Pileated Woodpeckers were seen and more often heard, but on an irregular basis and not as often as last year.

We had no sign of American Three-Toed or Black-backed Woodpeckers.

Falcons

Three species of falcons were present at the station this summer. **Merlins** were present from day one until the last day of monitoring. Several of them chose to stay over for a while before continuing their migration.



Merlin (Photo: Lucile Jacques)

American Kestrels were often seen hovering over the marsh, always to our amazement, no matter how often we have seen them do that. A few of them spent a few days in the marsh.



American Kestrel (Photo: Lucile Jacques)

At least three **Peregrine Falcons** were seen, also over the marsh. The ducks flushing were always the ones alerting us to the presence of the great predator, and it was always cause for much happy excitement to see one.

Flycatchers

We banded a lot more flycatchers than we saw or heard on site. Most common were the **Alder Flycatchers** singing in the morning well into August. **Hammond's** and **Dusky Flycatchers** were often reported on obs and census, as were sometimes **Least** and **Yellow-bellied Flycatchers**. A strange-sounding flycatcher spent a few days on site, which the team agreed was a **Pacific-slope Flycatcher**.

The most exciting flycatcher encounter was definitely a **Say's Phoebe**, spotted in the dry marsh between nets 11 and 3. It had been a few years since that species was reported at MNO.



Say's Phoebe (Photo: Kirstin Lachance)



Everyone came down to the marsh to take a look at the Say's Phoebe. Left to right: Banders Ben, Laura and Kirstin, and volunteer Doug (Photo: Lucile Jacques)

Vireos

Warbling Vireos were the most common vireo at the station. They breed in the area and we had many young begging during the first weeks of the season.

Red-eyed, Cassin's and even **Blue-headed Vireos** were also heard or seen, but much less frequently.

Jays and Crows

American Crows and **Common Ravens** were encountered almost every day at the station, but we had no jays. We were both surprised and excited to see a **Black-billed Magpie** zoom by one day in September, chased by a Sharp-shinned Hawk (we're not sure what the story was, really). It made for a second of head-scratching, and that's all we saw of magpies.

Swallows

The station was very busy with swallows this year, as usual. The most common species was **Barn Swallow**, which is also the species that stayed the latest (the last migrants came through early September) and the only one we banded.

Tree and **Northern Rough-winged Swallows** were also quite present, as were **Bank, Violet-green,** and **Cliff Swallows**, but in smaller numbers.

Chickadees

This year was pretty quiet for chickadees. The only species encountered on site was the **Black-capped Chickadee**, and they were pretty scarce. A **Boreal Chickadee** was heard on census once mid-August, but that was it.

Nuthatches and Creepers

As usual, the station was alive with the calls of **Red-breasted Nuthatch** for most of the season. Many of them spent a good deal of the season on site before becoming rarer towards the end of September.

A **Brown Creeper** was heard once at the beginning of the season, but that was surprisingly it. We also did not catch any this year.

Wrens

Although we heard **Pacific Wrens** sing only a couple of times, we did catch two hatch year birds.

Kinglets

The site was buzzing with **Ruby-crowned** and **Golden-crowned Kinglets** from day one. We banded quite a few fledglings of both species all the way into September. Ruby-crowned Kinglets were even heard singing on many occasions in September.

Thrushes

This year was busy with thrushes! **Swainson's Thrush** were seen, heard and/or banded every day until mid-September. **Hermit Thrush** were quiet and not encountered much, but we know they were present thanks to our nets!

Varied Thrush were encountered almost daily in September and the first ones were heard in the morning, even in August. **American Robins** were frequently seen and heard, and we often saw small flocks migrating. We saw a total of three **Townsend's Solitaires**, close enough for pictures, but unfortunately never caught one.

The one exception to that thrush-fest was the **Gray-cheeked Thrush**: we only banded one and did not see or hear any others.

Pipits

A total of three **American Pipits** were seen on census, twice in a week mid-September, and that was the only time we encountered this species.



American Pipit (Photo: Kirstin Lachance)

Waxwings

Both **Cedar** and **Bohemian Waxwings** were present this year, but in very small numbers. Only a couple of Bohemian Waxwings were seen on three separate occasions, and even the Cedar Waxwings were few and left early.

Warblers

The most common warbler encountered at the station was by far the **Yellow-rumped Warbler**. Second was the **American Redstart**, from day one and well into September. Also frequently reported were **Yellow**, **Orange-crowned** and **Magnolia Warblers** as well as **Common Yellowthroat**. **Ovenbird**, **Northern Waterthrush**, **Tennessee**, **Townsend's** and **Black-and-white Warblers**, but were more frequently banded than seen or heard.

Tanagers

We had quite a high number of **Western Tanagers** this year, both in the bush and in our nets. They were present from the first day of the season to well into August.



Western Tanager (Photo: Laura Tabbakh)

Sparrows

Outside of banding, the most common sparrows seen and heard at the station all season were **Dark-eyed Junco** and **White-crowned Sparrow**. **Lincoln's Sparrows** were numerous from day one until end of August, and many spent some days here and were probably breeding here before we began monitoring. **Swamp Sparrows** were scarce, but one of them spent a couple of weeks singing in the marsh. **Savannah's, Chipping, Fox** and **Song Sparrows** were also present on site, but we banded them more than we saw them. **White-throated Sparrows** were rather discreet throughout the season. Although we banded **Golden-crowned Sparrows**, we never found them outside of our nets.



Song Sparrow (Photo: Kirstin Lachance)

Blackbirds

The blackbirds were scarce this year, as was to be expected with the marsh being so dry. We only observed a few **Red-winged Blackbirds**, **Brown-headed Cowbirds**, and **Rusty Blackbirds**.

Cardinalids

White-winged and **Red Crossbills** were both reported on many occasions, always shooting over the station and never even coming down to the trees. **Evening Grosbeaks** were encountered a few times, one of which was close enough to our nets to give us false hopes...

The best surprise of the family was an adult male **Rose-breasted Grosbeak** seen and heard singing two days in a row at the very beginning of the season.

Finches

The most common finch was the **Pine Siskin**, of which we encountered hundreds on some days. At the beginning of the season, **Purple Finches** were often seen or heard until they left early August.

OTHER WILDLIFE OBSERVATIONS AT THE MARSH

by Kirstin Laviolette Lachance

Apart from birds, many other types of wildlife were observed throughout the season.

To begin, we saw many **Common Garter Snakes** all around the station, including in their favourite sunning spot by the Memorial Bench near net 11. Many more yearlings were seen than usual this year.

It must have been a record-year for **Moose** at the station; we had multiple moose at once in the marsh on many occasions, including one evening with six different individuals! We had many cows with calves, including two sets of twins.



*Four cows at sunrise
(Photo: Lucile Jacques)*



Cow Moose with twins (Photo: Top: Lucile Jacques; bottom: Kirstin Lachance)

We didn't see any **Mule Deer**; however we did see some **White-tailed Deer** at the station this year, including one on the road very close to the nets, which had to be scared off from the net lane area.

Many an encounter was had with **American Black Bear** this season. The drought has resulted in problem bears in town, since the berries were lacking this year, and it seemed to have brought them out to us at the station as well. Black Bears were seen along the census trail, on the road while riding bikes to the Far Far nets, as well as right along two net lanes. None of these encounters required the use of bear spray; however, they did all require the banders and volunteers to deter the bears with their voices and to always carry bear spray with them.



Black Bear (Photo: Kirstin Lachance)

Excitingly, a **Grizzly Bear** was also seen twice within the observation limits, both times across the marsh, which is a very safe distance away. It was most likely the same bear on two separate occasions; the first time he was walking west, and a week or so later he was spotted again, coming back the way he came from. The first time he was seen caused quite the stir and everyone at the station took photos and videos of the bear.



Grizzly in the marsh (Photo: Ben Breton)

More grizzlies were seen on the Parsnip FSR going into town, including some sows with cubs. It was quite the year for bears!

This year, one of our dedicated volunteers saw a **Canada Lynx** by the Far Far nets! He got spooked away within seconds of being seen, but two people stayed to monitor the area near those nets for the next net round,

just in case he came back, which he didn't (fortunately/unfortunately).

Another carnivore observed this year was **Coyote**. Once again, they weren't visual observations, but audio. We mostly heard yipping on the south-east side of the marsh, except for one morning when they were heard very close to Net 32, on the north-west side of the station.

We also had many other mammals this year. Two families of **North American River Otters** playing in the marsh, with the large babies making very cute squeaks when their parents weren't right next to them!



Otter in the small pond (Photo: David Lambie)



Everyone took a break to come down to the pond and watch the otters!

Left: Bander Kirstin. Right: Bander Ben and volunteer Lauren (Photos: David Lambie)

The **Short-tailed Weasels** were back again, although they were only here during the month of August this year.

There were lots of **Red Squirrels** as usual, including one that seemed to have gotten in quite the scuffle and was missing an eye.



Red squirrel (Photo: Natalie Srochenski)

This year, we also saw a lot of **Snowshoe Hares**, including one on the last day who had started his winter moult, and had little white feet and tail!

A few **American Beavers** were seen again in the marsh, so we are certain those lodges are still in working order!



*Beaver in the marsh
(Photo: Kirstin Lachance)*

Owling was quite eventful this year, not only for owls, but because it brought us two other flying species: a **Little Brown Bat** and a **Northern Flying Squirrel**! The bat was very easy to extract: owl-BIC Kirstin simply had to open its wings to show it that it

wasn't tangled and off it flew. The flying squirrel was trickier! It had to be extracted by scruffing and untangling it from the net as it hopped panels.

The same amphibians as usual were found this year, which includes many many **Western Toads**, some **Wood Frogs**, and a **Long-toed Salamander**!



Western Toad (Photo: Ben Breton)

Finally, many different arthropods were observed this year, like butterflies, moths, dragonflies, and damselflies. We were extracting darners from the nets until the very last day of the season.



Mourning Cloak (Photo: Lucile Jacques)



*Compton's Tortoiseshell
(Photo: Lucile Jacques)*

OTHER PROJECTS AND SIGHTINGS

Wildlife Sightings outside of the station

by Laura Tabbakh

Most of what we see at the station, we also see outside of the station. This year, we had two exceptions to the rule.

Again this year, **Steller's Jays** were not seen at the station. They were, however, spotted close by, namely at Heather-Dina Lakes Provincial Park, on the road up Morfee Mountain, and in Bijoux Falls Provincial Park as usual.



Steller's Jay (Photo: Lucile Jacques)

The Supplemental Feeding Program of the Kennedy Siding Caribou herd continues for its ninth consecutive year (<https://mliwildlife.ca/program>). While the banding team left Mackenzie too early to spot the caribou, board director David made several trips to the feeding station and came back with a few beautiful pictures.

More pictures of the caribou are on YouTube at [Kennedy Siding \(youtube.com\)](https://www.youtube.com/KennedySiding)



*Caribou at Kennedy Siding
(Photo: David Lambie)*



*Caribou at Kennedy Siding
(Photo: David Lambie)*

Osprey nest monitoring project

by Sue Crosby

In the early part of May 2023, Osprey nests that were identified in 2022 were checked. Over the winter, the long-existing nest located on Morfee Mountain Road/Morfee Creek came down. It had been built on a nesting platform and was a large nest. It is likely that the intense wind, snow and rain of the winter weakened the structure and brought it down. Male and female were observed rebuilding the nest over the course of a few days mid-May. They worked efficiently, with Dad bringing the branches and Mom arranging them. The nest continued to be a favourite with the public as it was easily observed from the road. Even though the road experienced much traffic over the summer, a healthy chick was born and flourished.



Osprey in flight (Photo: Sue Crosby)

Within a 10 km radius of Mackenzie townsite 12 other nests were identified with Osprey activity. This included one new nest. All of these nests had at least one Osprey hanging around, most had two adults. Observations in July showed a number of adults demonstrating defensive behaviour when being observed, which led to speculation of the existence of eggs. Chicks were observed on nests at Morfee Mountain Road, Morfee Creek north, the nest at the Rodeo Grounds, the new nest near the Finlay Navigation Road and the Gataiga Creek nest. The Gataiga Creek nest is the

largest nest observed in our area and is easily seen from the highway or by walking along the pipeline. Fledglings were observed on 4 out of 5 of these nests well into the month of September. New nests were built at a number of locations later in the season, possibly as practice nests or attempted second brood nests. Along the pipeline/powerline near the Duz Cho gravel pit entrance, 5 nests on power poles can be seen, all without moving from one spot.

Despite the smoky summer, our Ospreys have been busy! At the Mugaha Marsh banding station a pair of Ospreys was observed much of the season, and begging calls from chicks were often heard. The pair built a second nest over the inner pond visible from the road late in the summer. It will be interesting to see which one they use when they return next summer. Many thanks go to MNO volunteers Sue Crosby and Jim Wellsman and to public observers.



*Osprey nest with two chicks
(Photo: Sue Crosby)*

Interesting Facts:¹

- Chicks are very adept at remaining inconspicuous in the nest, which is a challenge when doing observations
- New nests can be built up in response to previous years nest being occupied by Canada Geese
- Prolonged wet weather, predation by Bald Eagles, and lack of fish can affect survival rates
- Ospreys subsist almost entirely on fish.

The Motus Wildlife Tracking System

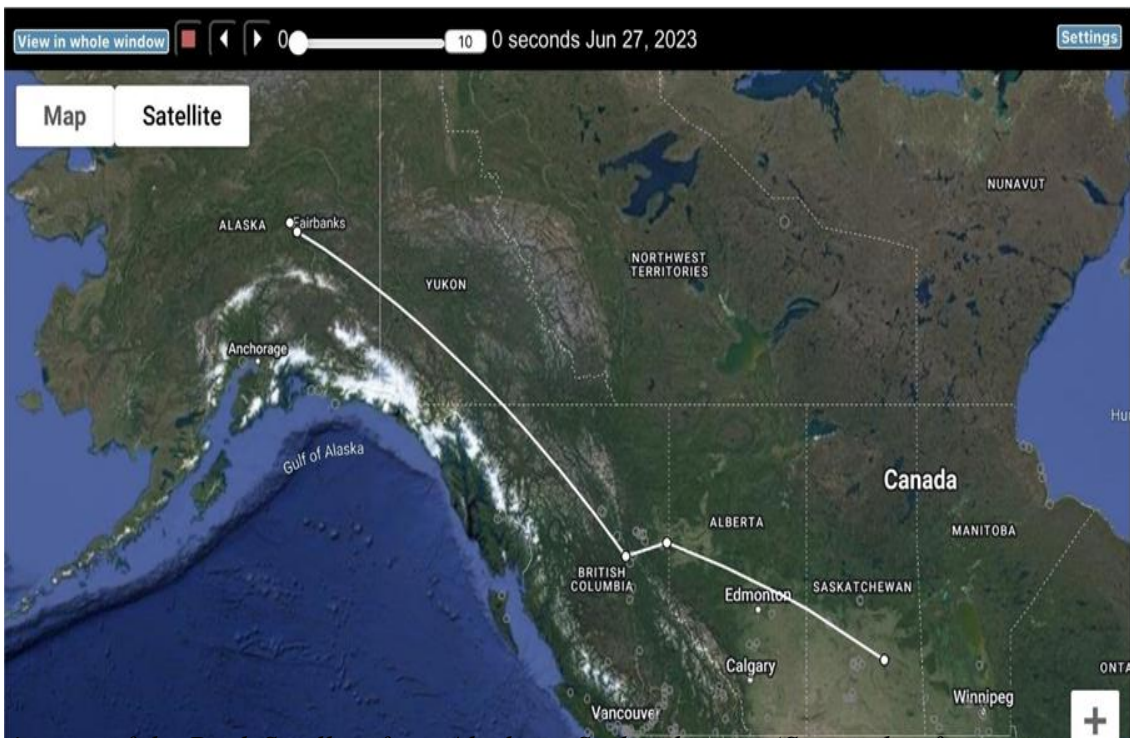
by Sue Crosby

The Motus wildlife tracking system is an international collaborative network of researchers that use automated radio telemetry to simultaneously track hundreds of individuals of numerous species of birds, bats, and insects. The system allows a community of researchers, educators, organizations, and citizens to participate in research and education on the ecology and conservation of migratory animals. These stations are maintained by a community of researchers, organizations, non-profits, governments, and individuals. In order for this concept to work, the system requires a centralized database and management system that all participants use. (Information is from <https://Motus.org>).

Our station is fortunate to have a Motus tower. Another tower is located at the sewage lagoons in Mackenzie just below Bell Place.

This summer both of these towers detected birds with tags! Both towers detected the same White-throated Sparrow. This sparrow is part of a project undertaken by the University of Northern BC under the direction of Dr. Ken Otter. The sparrow was detected at Mugaha Marsh on Oct. 3 and at the lagoon on the same day.

The tower at the sewage lagoons also detected a Bank Swallow on July 28. This Bank Swallow is part of a project titled 'Bank Swallow migratory connectivity in boreal Alaska' undertaken by Alaska Fish and Game (Julie Hagelin). The deployment date of this tag was June 27, 2023. The screenshot below shows the pathway of the Bank Swallow from near Fairbanks, Alaska, to Mackenzie BC, to Dawson Creek, BC, to Saskatchewan. Where will this amazing traveller turn up next?



Trajectory of the Bank Swallow from Alaska to Saskatchewan. (Screenshot from motus.org)

APPENDICES

Appendix 1: Monthly Summaries of Daily Standard Banding, Fall 2023, Mugaha Marsh

Page 1 of 6

Birds Banded by Month					Birds Banded by day in July													
Species	JUL	AUG	SEPT	TOTALS	19	20	21	22	23	24	25	26	27	28	29	30	31	CODE
Broad-winged Hawk			1	1														BWHA
Yellow-bellied Sapsucker	4	3		7	1								1			2		YBSA
Red-breasted Sapsucker	3	2	2	7	2	1												RBSA
<i>Hybrid Sapsucker</i>	1			1											1			HYSA
Northern Flicker		1		1														NOFL
<i>Red-shafted Flicker</i>		1		1														RSFL
<i>Flicker intergrade</i>		1		1														FLIN
Western Wood-Pewee	1	1		2													1	WEWP
Yellow-bellied Flycatcher		5		5														YBFL
Alder Flycatcher	21	83		104	1		4		5	1	1		1	2	1	2	3	ALFL
Least Flycatcher	45	26		71	2	1	7	4	2	6	2	5	5	2	1	6	2	LEFL
<i>Trail's Flycatcher</i>		1		1														TRFL
Hammond's Flycatcher	16	27	3	46		2	1	1		1			3	3		5		HAFL
Dusky Flycatcher	27	16	3	46	2	3	1	1		4	1	6	5		2		2	DUFL
Western Flycatcher	1	1		2		1												WEFL
Eastern Kingbird	4			4									1	1	2			EAKI
Cassin's Vireo	1		1	2													1	CAVI
Blue-headed Vireo		1		1														BHVI
Warbling Vireo	25	32		57	3	1	2	2	1	5			4	2		1	4	WAVI
Red-eyed Vireo	2	1		3						2								REVI
Tree Swallow	1			1								1						TRES
Barn Swallow	1			1										1				BARS
Black-capped Chickadee	7	18	7	32			4					1	2					BCCH
Red-breasted Nuthatch	1	2	2	5					1									RBNU
Pacific Wren		1	1	2														PAWR
Ruby-crowned Kinglet	13	90	231	334		1	1		1				3	3	1	2	1	RCKI
Golden-crowned Kinglet	2	111	100	213				1						1				GCKI
Gray-cheeked Thrush			1	1														GCTH
Swainson's Thrush	70	194	9	273	3	7	3	4	4	3	1	1	6	9	8	15	6	SWTH
Hermit Thrush	1	8	5	14									1					HETH
American Robin	11	12	1	24		1							1		3	2	4	AMRO
Varied Thrush		4	3	7														VATH
European Starling		1		1														EUST
Cedar Waxwing	4			4		2					1						1	CEDW
Northern Waterthrush	29	48	1	78	3	2	2	5				1	1	5	6	1	3	NOWA

Appendix 1: Monthly Summaries of Daily Standard Banding, Fall 2023, Mugaha Marsh

Page 2 of 6

Birds Banded by Month					Birds Banded by day in July													
Species	JUL	AUG	SEPT	TOTALS	19	20	21	22	23	24	25	26	27	28	29	30	31	CODE
Ovenbird	9	8		17		3	3	1						1	1			OVEN
Black-and-white Warbler	2	5		7		1				1								BAWW
Tennessee Warbler	4	6		10		1		1				1				1		TEWA
Orange-crowned Warbler	20	59	59	138	1	4	2			3		1	3		1	3	2	OCWA
MacGillivray's Warbler	3	11		14										1	1	1		MGWA
Mourning Warbler		1		1														MOWA
Common Yellowthroat	25	23	16	64	2	5			4	4			1		4	3	2	COYE
American Redstart	105	140	11	256	2	6	6	7	1	9		2	16	17	14	12	13	AMRE
American Tree Sparrow		1		1														CMWA
Magnolia Warbler	41	59	9	109		1	1	3	1				3	7	6	8	11	MAWA
Yellow Warbler	43	34	1	78	4	3	6	2	3	3		1	5		11	2	3	Yewa
Blackpoll Warbler		7	4	11														BLPW
Yellow-rumped Warbler	3	51	85	139									1			2		YRWA
Myrtle Warbler		12	37	49														MYWA
Unknown Yellow-rumped Warbler	3	34	46	83									1			2		UYRW
Audubon's Warbler		5	2	7														AUWA
Townsend's Warbler	2	6	2	10						1							1	TOWA
Wilson's Warbler	6	132	9	147								1	3	1	1			WIWA
American Tree Sparrow			3	3														ATSP
Chipping Sparrow	10	38	3	51					1	1			1		1		6	CHSP
Clay-colored Sparrow	4	6		10				1				1	1	1				CCSP
Fox Sparrow		3	1	4														FOSP
Dark-eyed Junco	13	81	77	171	2	5	1		1						2		2	DEJU
Slate-colored Junco			6	6														SCJU
Oregon Junco	1	58	66	125	1													ORJU
Unidentified Dark-eyed Junco	12	23	5	40	1	5	1		1						2		2	UDEJ
White-crowned Sparrow		20	39	59														WCSP
Gambel's White-crowned Sparrow		20	39	59														GWCS
Golden-crowned Sparrow		1	3	4														GCSP
White-throated Sparrow	11	12	5	28		6		3						2				WTSP
Savannah Sparrow		17	6	23														SAVS
Song Sparrow	11	2	1	14	1	1				3		3		1	2			SOSP
Lincoln's Sparrow	7	12	5	24	2	3									1	1		LISP
Swamp Sparrow	5	2		7			3			1						1		SWSP
Western Tanager	11	29		40			5						1		1	2	2	WETA
Rose-breasted Grosebeak	1			1		1												RBGR
Brown-headed Cowbird		1		1														BHCO
Purple Finch	6			6		4		1	1									PUFI
Total Individuals	633	1456	710	2799	31	66	52	37	26	48	6	25	69	60	71	72	70	Total ind.
# Species	45	53	35	62	15	25	17	15	13	16	5	13	23	18	21	20	20	# species
Net Hours	867.50	2143	1537	4547.75	72	72	72	72	71	72	14	70	65	72	72	72	72	Net Hours
Birds per Net Hour	0.73	0.68	0.46	0.62	0.43	0.92	0.72	0.51	0.37	0.67	0.43	0.36	1.06	0.83	0.99	1.00	0.97	birds/net hr

Appendix 1: Monthly Summaries of Daily Standard Banding, Fall 2023, Mugaha Marsh

Page 3 of 6

Birds Banded by day in August																																
CODE	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	CODE
BWHA																																BWHA
YBSA		1		1		1																										YBSA
RBSA										1										1												RBSA
HYSA																																HYSA
NOFL																																NOFL
RSFL	1																															RSFL
FLIN																							1									FLIN
WEWP	1																															WEWP
YBFL			1							1					1					2												YBFL
ALFL		3	2	1	2	3	6	1		4	3	2		1				1		3	8	11	14	13		3	1				1	ALFL
LEFL	3	3	1	2		1		1	1	5		2		1	1						2		2			1						LEFL
TRFL																										1						TRFL
HAFL	3		1	1	1			1	1	2		3	1	5			1	1		2	1		1			1		1				HAFL
DUFL		4			1					2	2			1	1	1		1							2					1		DUFL
WEFL														1																		WEFL
EAKI																																EAKI
CAVI																																CAVI
BHVI	1																															BHVI
WAVI					1	4	3		1	2	1	3	1	11				1		1	2			1								WAVI
REVI																							1									REVI
TRES																																TRES
BARS																																BARS
BCCH			6	1									3				1					2	1		2	1			1			BCCH
RBNU								1						1																		RBNU
PAWR			1																													PAWR
RCKI	2	3	2			1	2	2	2		3	3		2	1		2		4	3	4	6	13	3	2	3	2	1	11	4	9	RCKI
GCKI				2				1					1			1	5		1	8	14	16	1	2	8	3	10	17	8	11	2	GCKI
GCTH																																GCTH
SWTH	6	7	1	3	7	9	5	1	4	6	6	6	5	14	9	9	5	12	25	13	12	7	5	7	2		4	2		2		SWTH
HETH		2				1					1					1				1					1			1				HETH
AMRO		2									1		1	2	3		1											1		1		AMRO
VATH									1											1			1		1							VATH
EUST		1																														EUST
CEDW																																CEDW
NOWA	4	4	3	2	4	2	1		7	1	7	4		3	2				1	1			1								1	NOWA

Appendix 1: Monthly Summaries of Daily Standard Banding, Fall 2023, Mugaha Marsh

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	Birds Banded by day in August																																
CODE	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	CODE	
OVEN											1								2	3		2									OVEN		
BAWW												01		01			02														BAWW		
TEWA								1												1	1		2						1		TEWA		
OCWA			3		1	2	2		2	1	3	1	2	3	4	2	4	1		1	1	2	3	2	2	4	2	2	2	2	5	OCWA	
MGWA		2	1		1			1		1		1		1						1			1				1				MGWA		
MOWA				1																											MOWA		
COYE		5	1			1					1		1				2			1		1	5	2					2		1	COYE	
AMRE	11	14	3	16		3	10	2	4	2	12	11	4	4	7		5	3	2	4	5	1	4	1	1			2	4	1	4	AMRE	
CMWA																						1									CMWA		
MAWA	4	4	4		1	2	5	4	1	1	2	2	2	2	2	1			2	1	6	4	2		1		3	1	1		1	MAWA	
YEWA	2	1	3	2	3	3	2						1	3	1		1			1	4		2		1	1	1		2			YEWA	
BLPW							1				1			2									1				1				1	BLPW	
YRWA																																YRWA	
MYWA														2	2		2						1		1				3	1		MYWA	
AUWA														1			1							1	1				1			AUWA	
UYRW	1		1	1	2	1								3		3	9			3		2		2	1			1	1		3	UYRW	
TOWA																						4	1								1	TOWA	
WIWA	2	1	2		1	2	2	1	3	1	1	6		3	1	1			4	3	21	7	55	3	1	5	2	1	1		2	WIWA	
ATSP																																ATSP	
CHSP			1	2			1			1				1				3			3	5	7	6	1	4			2	1		CHSP	
CCSP	1			1			1									1								1				1				CCSP	
FOSP																							1			1				1		FOSP	
DEJU																																DEJU	
SCJU																																SCJU	
ORJU				1		1	2					3	2				2		2	8	1	4	2	5	3		7	3	3	9		ORJU	
UDEJ						3	2			1		6		1	1		1						1	1		1	3		1	1		UDEJ	
WCSP																				1				5	3		3	4	2	1	1	WCSP	
GWCS																				1				5	3		3	4	2	1	1	GWCS	
GCSP																							1									GCSP	
WTSP	2	1				1			1	1				1		1					2			1				1				WTSP	
SAVS																	1				1	1	4	2	3		2				3	SAVS	
SOSP							1															1										SOSP	
LISP	1	1					2		1								3						1		1		1			1		LISP	
SWSP																1	1															SWSP	
WETA	1	2	3			2	1	1	3		4		1	1	7		1		1	1												WETA	
RBGR																																RBGR	
BHCO					1																												BHCO
PUFI																																PUFI	
Total	46	61	40	37	26	43	49	18	32	33	49	54	25	72	43	22	50	23	44	65	88	77	134	59	38	29	43	39	46	37	35	Total	
# species	17	19	19	15	13	18	17	13	14	17	16	14	13	24	15	11	17	8	10	24	17	18	27	17	18	12	14	15	14	17	14	# species	
Net Hours	72	72	72	70	72	72	71	54	72	72	66	72	70	72	59	72	72	42	72	72	67	72	72	72	66	72	72	70	72	68	72	Net Hours	
birds/net hr	0.64	0.85	0.56	0.53	0.36	0.60	0.69	0.33	0.44	0.46	0.74	0.75	0.36	1.00	0.73	0.31	0.69	0.55	0.61	0.90	1.32	1.07	1.86	0.82	0.58	0.40	0.60	0.56	0.64	0.54	0.49	birds/net hr	

Appendix 1: Monthly Summaries of Daily Standard Banding, Fall 2023, Mugaha Marsh

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Species	Birds Banded by day in September																							Total	CODE
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
Broad-winged Hawk				1																				1	BWHA
Yellow-bellied Sapsucker																								7	YBSA
Red-breasted Sapsucker		2																						7	RBSA
Hybrid Sapsucker																								1	HYSA
Northern Flicker																								1	NOFL
Red-shafted Flicker																								1	RSFL
Flicker intergrade																								1	FLIN
Western Wood-Pewee																								2	WEWP
Yellow-bellied Flycatcher																								5	YBFL
Alder Flycatcher																								104	ALFL
Least Flycatcher																								71	LEFL
Traill's Flycatcher																								1	TRFL
Hammond's Flycatcher					2						1													46	HAFL
Dusky Flycatcher	1			1	1																			46	DUFL
Western Flycatcher																								2	WEFL
Eastern Kingbird																								4	EAKI
Cassin's Vireo					1																			2	CAVI
Blue-headed Vireo																								1	BHVI
Warbling Vireo																								57	WAVI
Red-eyed Vireo																								3	REVI
Tree Swallow																								1	TRES
Barn Swallow																								1	BARS
Black-capped Chickadee			2		1						1								3					32	BCCH
Red-breasted Nuthatch		1			1																			5	RBNU
Pacific Wren																				1				2	PAWR
Ruby-crowned Kinglet	12	6	18	14	20	15	13	10	4	9	9	10	21	12	8	12	5	3	15	4	4	6	1	334	RCKI
Golden-crowned Kinglet	13		9	1		6	3	40		1	3	2		5		5	2		2	1	1	1	5	213	GCKI
Gray-cheeked Thrush			1																					1	GCTH
Swainson's Thrush			1	2	1	3	1	1																273	SWTH
Hermit Thrush		1								1	1									1	1			14	HETH
American Robin		1																						24	AMRO
Varied Thrush							2													1				7	VATH
European Starling																								1	EUST
Cedar Waxwing																								4	CEDW
Northern Waterthrush		1																						78	NOWA

Appendix 1: Monthly Summaries of Daily Standard Banding, Fall 2023, Mugaha Marsh

Page 6 of 6

Species	Birds Banded by day in September																							Total	CODE
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
Ovenbird																								17	OVEN
Black-and-white Warbler																								6	BAWW
Tennessee Warbler																								10	TEWA
Orange-crowned Warbler	5	7	8	8	4	4	4	2	1		1	3	1	2	1	4	1		2		1			138	OCWA
MacGillivray's Warbler																								14	MGWA
Mouring Warbler																								1	MOWA
Common Yellowthroat	2	2	1		1	2		1		1	1		2		3									64	COYE
American Redstart	1	2	1	1	2	2					1				1									256	AMRE
American Tree Sparrow																								1	CMWA
Magnolia Warbler	1		2	1	1			1			1	1								1				109	MAWA
Yellow Warbler							1																	78	Yewa
Blackpoll Warbler					1	1			1		1													11	BLPW
Yellow-rumped Warbler																								139	YRWA
Myrtle Warbler	2	3	3	1		4		1	4	1	2	2	2		2	1	4		2		1	1	1	49	MYWA
Audubon's Warbler								1	1															7	AUWA
Unknown Yellow-rumped Warbler	3	7	3	4	3	3		3	4		2	4	1		2	2	2	1				2		83	UYRW
Townsend's Warbler	1										1													10	TOWA
Wilson's Warbler	1		3	2		1		1				1												147	WIWA
American Tree Sparrow																			1	1	1			3	ATSP
Chipping Sparrow		1	1																		1			51	CHSP
Clay-colored Sparrow																								10	CCSP
Fox Sparrow																				1				4	FOSP
Dark-eyed Junco																								171	DEJU
Slate-colored Junco										1	1									2	1	1		6	SCJU
Oregon Junco	2	3		1	1	5	2	2	8		1	1	4	8	1				9	8	2	1	7	125	ORJU
Unidentified Dark-eyed Junco									1						1	1				2				40	UDEJ
White-crowned Sparrow		3	8	2		5	2	2	1			3		3	2		4		3		1			59	WCSP
Gambel's White-crowned Sparrow		3	8	2		5	2	2	1			3		3	2		4		3		1			59	GWCS
Golden-crowned Sparrow													1	1			1							4	GCSP
White-throated Sparrow			1	1					1		1	1												28	WTSP
Savannah Sparrow	1			1					2				1				1							23	SAVS
Song Sparrow														1										14	SOSP
Lincoln's Sparrow	1	2			1			1																24	LISP
Swamp Sparrow																								7	SWSP
Western Tanager																								40	WETA
Rose-breasted Grosebeak																								1	RBGR
Brown-headed Cowbird																								1	BHCO
Purple Finch																								6	PUFI
Total	46	42	62	41	41	51	28	66	28	14	27	29	33	32	21	25	20	4	37	23	14	12	14	2799	Total
# species	13	14	14	14	15	11	8	11	8	6	13	10	7	7	7	5	7	2	8	9	9	4	4	62	# species
net hours	63	54	72	72	72	72	70	71	71	72	72	45	70	66	69	69	42	72	63	72	72	70	68	4547.8	net hours
birds/net hr	0.73	0.78	0.86	0.57	0.57	0.71	0.40	0.93	0.40	0.19	0.38	0.64	0.47	0.48	0.31	0.36	0.48	0.06	0.59	0.32	0.19	0.17	0.21	0.6157	birds/net hr

Appendix 2: Birds Banded in Standard Banding, 1995-2023 (rev.2022), Mugaha Marsh

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Species ↓	1995 11 Aug - 24 Sep	1996 5 Aug - 28 Sep	1997 26 Jul - 26 Sep	1998 21 Jul - 20 Sep	1999 19 Jul - 19 Sep	2000 23 Jul - 24 Sep	2001 22 Jul - 23 Sep	2002 21 Jul - 22 Sep	2003 20 Jul - 21 Sep	2004 20 Jul - 22 Sep	2005 19 Jul - 22 Sep	2006 18 Jul - 23 Sep	2007 19 Jul - 23 Sep	2008 19 Jul - 23 Sep	Code
Broad-winged Hawk		1													BWHA
Northern Harrier		1													NOHA
Sharp-shinned Hawk		7	1	1	2	2	1	4			2	3		2	SSHA
Cooper's Hawk				1											COHA
Sora			1											1	SORA
Western Sandpiper		1	1												WESA
Wilson's Snipe		5	3	1				4		1	1	1	4		WISN
Solitary Sandpiper		1													SOSA
Belted Kingfisher											1		1		BEKI
Yellow-bellied Sapsucker		2	1	5	2			5	1	15	4	9	4	2	YBSA
Red-naped Sapsucker								1							RNSA
Red-breasted Sapsucker		1	2	1	2	1	1		4	5			2	3	RBSA
Hybrid Sapsucker	1		3	6		1					7	5	3	6	HYSA
Downy Woodpecker		1	1	2	6	18	19		17	8	5	9	16	18	DOWO
Hairy Woodpecker		1		2	1	2	1	2	9	1		3	2		HAWO
American Three-toed Woodpecker									1	1			2		TTWO
Yellow-shafted Flicker			3	1	1				1		3			1	YSFL
Northern Flicker Intergrade			1	1	3	1			2	1		1	1	3	FLIN
Red-shafted Flicker		1		1	2	1	1		1						RSFL
Northern Flickers		1	4	3	6	2	1		4	1	3	1	1	4	NOFL
American Kestrel		1				1									AMKE
Merlin					1			1	1				1		MERL
Olive-sided Flycatcher			2											1	OSFL
Western Wood-Pewee	1	2	13	9	2	2		2	1	11	10	5	10	16	WEWP
Yellow-bellied Flycatcher	1	4	7	4	3	5	4	3	6	3	7	3	1	2	YBFL
Alder Flycatcher	23	87	138	93	77	99	74	52	110	192	179	32	119	50	ALFL
Willow Flycatcher															WIFL
Traill's Flycatcher															TRFL
Least Flycatcher	13	28	102	97	118	77	73	68	67	46	67	90	88	91	LEFL
Hammond's Flycatcher	13	25	57	41	51	67	74	64	69	52	52	47	43	35	HAFL
Dusky Flycatcher	5	18	35	24	30	17	26	17	41	38	34	20	13	26	DUFL
Pacific-slope Flycatcher					2	1				1			6		PSFL
Western Flycatcher		1	8	2	1			1	4	1					WEFL
Say's Phoebe				1											SAPH
Ash-throated Flycatcher														1	ATFL
Eastern Kingbird		5		2					6					3	EAKI
Northern Shrike												1			NSHR

Appendix 2: Birds Banded in Standard Banding, 1995-2023 (rev.2022), Mugaha Marsh

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Species ↓	2009 19 Jul - 23 Sep	2010 17 Jul - 23 Sep	2011 19 Jul - 23 Sep	2012 19 Jul - 23 Sep	2013 19 Jul - 23 Sep	2014 19 Jul - 23 Sep	2015 19 Jul - 23 Sep	2016 18 Jul - 23 Sep	2017 19 Jul - 23 Sep	2018 19 Jul - 23 Sep	2019 19 Jul - 23 Sep	2021 19 Jul - 23 Sep	2022 19 Jul - 23 Sep	2023 19 Jul - 23 Sep	Totals 1995- 2023	Code
Broad-winged Hawk														1	2	BWHA
Northern Harrier															1	NOHA
Sharp-shinned Hawk	2	4	1	2		1	1	3		3	1	6	2		51	SSHA
Cooper's Hawk															1	COHA
Sora															2	SORA
Western Sandpiper															2	WESA
Wilson's Snipe	1		1	3					1						26	WISN
Solitary Sandpiper															1	SOSA
Belted Kingfisher	1		1										1		5	BEKI
Yellow-bellied Sapsucker	5	7	13	6	12	13	8		1	6	3	3	5	7	139	YBSA
Red-naped Sapsucker															1	RNSA
Red-breasted Sapsucker			1			2	2					1	1	7	36	RBSA
Hybrid Sapsucker	3		1			1	3		1		6		1	1	49	HYSA
Downy Woodpecker	7	7	13	11	7	11	5		8	1	8	2	3		203	DOWO
Hairy Woodpecker	1	1		1	1	2	3	1	3	1					38	HAWO
Am. Three-toed Woodpecker		1													5	TTWO
Yellow-shafted Flicker		1		1									1		13	YSFL
Northern Flicker Intergrade			1		2	1				4	1		3	1	27	FLIN
Red-shafted Flicker					1									1	9	RSFL
Northern Flicker		1	1	1	3	1				4	1		4	2	49	NOFL
American Kestrel		1													3	AMKE
Merlin															4	MERL
Olive-sided Flycatcher			1			1		1							6	OSFL
Western Wood-Pewee	1	1	1				3	1	1				1	2	95	WEWP
Yellow-bellied Flycatcher	2	3	3	3	4	3	5	7	10	7	4	9	6	5	124	YBFL
Alder Flycatcher	55	54	55	49	107	99	130	122	90	62	93	81	59	104	2485	ALFL
Willow Flycatcher								1							1	WIFL
Traill's Flycatcher	1						1							1	3	TRFL
Least Flycatcher	104	82	84	95	156	139	178	70	94	49	46	60	73	71	2326	LEFL
Hammond's Flycatcher	60	73	41	31	66	80	82	22	34	26	62	19	30	46	1362	HAFL
Dusky Flycatcher	25	39	31	19	42	41	99	34	36	30	45	27	30	46	888	DUFL
Pacific-slope Flycatcher		1					4				1	2			18	PSFL
Western Flycatcher	1				4									2	25	WEFL
Say's Phoebe					1						1				3	SAPH
Ash-throated Flycatcher															1	ATFL
Eastern Kingbird	3							2					2	4	27	EAKI
Northern Shrike													1		2	NSHR

Appendix 2: Birds Banded in Standard Banding, 1995-2023 (rev. 2022), Mugaha Marsh

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Species ↓	1995 11Aug 24 Sep	1996 5 Aug - 28 Sep	1997 26 Jul - 26 Sep	1998 21 Jul - 20 Sep	1999 19 Jul - 19 Sep	2000 23 Jul - 24 Sep	2001 22 Jul - 23 Sep	2002 21 Jul - 22 Sep	2003 20 Jul - 21 Sep	2004 20 Jul - 22 Sep	2005 19 Jul - 22 Sep	2006 18 Jul - 23 Sep	2007 19 Jul - 23 Sep	2008 19 Jul - 23 Sep	Code
Cassin's Vireo				9	5	1	4		5	15	4	3		4	CAVI
Blue-headed Vireo				1	4	1				2	4		1	2	BHVI
<i>Solitary Vireo</i>	2	6	10	9			1	3		7	6	4	3	1	SOVI
Philadelphia Vireo						1									PHVI
Warbling Vireo	13	51	61	76	77	49	25	35	33	44	63	40	59	26	WAVI
Red-eyed Vireo		3	7	5	3	5	8	11	8	6	3	1		1	REVI
Canada Jay	2	2	4	1			2								CAJA
Steller's Jay					1					1					STJA
Blue Jay															BLJA
Black-billed Magpie				1											BBMA
Northern Rough-winged Swallow			1											1	NRWS
Tree Swallow			3	2		3					3			1	TRES
Violet-green Swallow											1				VGSW
Bank Swallow			2	1											BANS
Barn Swallow			9	4		2					3	1		1	BARS
Black-capped Chickadee	17	18	16	92	20	101	33	22	64	76	14	23	24	71	BCCH
Mountain Chickadee														1	MOCH
Chestnut-backed Chickadee				1						1				4	CBCH
Boreal Chickadee		2	2			6				1		1			BOCH
<i>Hybrid Chickadee</i>													1	2	HYCH
Red-breasted Nuthatch		8	9	11	20	7	19	9	6	13		3	1	32	RBNU
Brown Creeper	4		1	2	1	1	1	2	5	4	1	5	3	4	BRCR
Pacific Wren								1	1			1	1	1	PAWR
Marsh Wren															MAWR
Golden-crowned Kinglet	3	15	19	122	55	62	50	49	102	60	55	74	38	113	GCKI
Ruby-crowned Kinglet	263	317	201	405	187	216	298	433	377	385	340	610	283	327	RCKI
Mountain Bluebird															MOBL
Townsend's Solitaire		1						1							TOSO
Gray-cheeked Thrush		1		2	1	4		3	2		1	1	1		GCTH
Swainson's Thrush	39	54	82	62	86	87	87	123	124	61	111	67	145	99	SWTH
Hermit Thrush	10	8	8	14	15	10	14	23	18	13	17	13	21	25	HETH
American Robin	3	6	17	31	18	10	1	30	19	9	12	7	17	10	AMRO
Gray Catbird															GRCA
Varied Thrush	1	4	1	2	3	1	2		12	3	2	2		4	VATH
European Starling															EUST
American Pipit															AMPI
Bohemian Waxwing					1					1		2			BOWA

Appendix 2: Birds Banded in Standard Banding, 1995-2023 (rev. 2023), Mugaha Marsh

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Species ↓	2009 19 Jul - 23 Sep	2010 17 Jul - 23 Sep	2011 19 Jul - 23 Sep	2012 19 Jul - 23 Sep	2013 19 Jul - 23 Sep	2014 19 Jul - 23 Sep	2015 19 Jul - 23 Sep	2016 18 Jul - 23 Sep	2017 19 Jul - 23 Sep	2018 19 Jul - 23 Sep	2019 19 Jul - 23 Sep	2021 19 Jul - 23 Sep	2022 19 Jul - 23 Sep	2023 19 Jul - 23 Sep	Totals 1995- 2023	Code
Cassin's Vireo	2	4		3	8	5	10	7	3	5	1	6		2	106	CAVI
Blue-headed Vireo							2	1			2		1	1	22	BHVI
<i>Solitary Vireo</i>	4	4		1											61	SOVI
Philadelphia Vireo											1				2	PHVI
Warbling Vireo	80	48	68	43	79	70	46	62	63	25	74	80	82	57	1529	WAVI
Red-eyed Vireo		1		2	12	9	1	2	4	2	1		5	3	103	REVI
Canada Jay				1	2	1					1	1			17	CAJA
Steller's Jay			1			1					1				5	STJA
Blue Jay					2								1		3	BLJA
Black-billed Magpie															1	BBMA
Northern Rough-winged Swallow				4			2			2			3		13	NRWS
Tree Swallow					2					3			4	1	22	TRES
Violet-green Swallow															1	VGSW
Bank Swallow								1		1			3		8	BANS
Barn Swallow			2	2									1	1	26	BARS
Black-capped Chickadee	18	33	28	31	28	73	23	25	15	27	90	20	17	32	1051	BCCH
Mountain Chickadee									1						2	MOCH
Chestnut-backed Chickadee									5			4			15	CBCH
Boreal Chickadee	2	1	1	3				11	1		1				32	BOCH
<i>Hybrid Chickadee</i>						1			1						5	HYCH
Red-breasted Nuthatch	4	10	4	12	1	1	2	8	11	5	3	5	15	5	224	RBNU
Brown Creeper		1	2		1	1	4	3		2	12	4			64	BRCR
Pacific Wren		1						2	1	1				2	12	PAWR
Marsh Wren								1							1	MAWR
Golden-crowned Kinglet	35	96	51	88	55	57	49	63	51	84	132	117	50	213	1958	GCKI
Ruby-crowned Kinglet	263	345	284	346	416	381	851	481	585	580	597	395	206	334	10706	RCKI
Mountain Bluebird			2												2	MOBL
Townsend's Solitaire			1							1		1			5	TOSO
Gray-cheeked Thrush	2	3	5	4	1	3	1	5		3	7	1	3	1	55	GCTH
Swainson's Thrush	119	124	190	187	257	302	196	201	152	154	277	238	206	273	4103	SWTH
Hermit Thrush	19	24	28	16	24	16	25	27	33	18	34	15	12	14	514	HETH
American Robin	19	18	44	14	29	45	17	10	7	21	27	9	11	24	485	AMRO
Gray Catbird											1				1	GRCA
Varied Thrush	1	2	4	2		1		3	2	2	8	4	3	7	76	VATH
European Starling						1					1			1	3	EUST
American Pipit		2					1	1			1				5	AMPI
Bohemian Waxwing				2											6	BOWA

Appendix 2: Birds Banded in Standard Banding, 1995-2023 (rev. 2023), Mugaha Marsh

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Species ↓	2009 19 Jul - 23 Sep	2010 17 Jul - 23 Sep	2011 19 Jul - 23 Sep	2012 19 Jul - 23 Sep	2013 19 Jul - 23 Sep	2014 19 Jul - 23 Sep	2015 19 Jul - 23 Sep	2016 18 Jul - 23 Sep	2017 19 Jul - 23 Sep	2018 19 Jul - 23 Sep	2019 19 Jul - 23 Sep	2021 19 Jul - 23 Sep	2022 19 Jul - 23 Sep	2023 19 Jul - 23 Sep	Totals 1995- 2023	Code
Cedar Waxwing	27	33	21	29	31	148	46	20	7	8	37	24	22	4	578	CEDW
Lapland Longspur															2	LALO
Ovenbird	2	1	5	5	6	3	11	3	2	5	5	7	12	17	166	OVEN
Northern Waterthrush	119	29	89	431	106	81	96	141	90	77	62	154	80	78	4610	NOWA
Black-and-White Warbler					2							1	6	6	16	BAWW
Tennessee Warbler	16	14	131	118	256	160	180	103	75	23	12	28	26	10	1389	TEWA
Orange-crowned Warbler	163	179	177	301	224	189	218	193	221	177	145	189	111	138	4324	OCWA
Nashville Warbler								1							1	NAWA
MacGillivray's Warbler	32	16	14	21	31	30	22	32	15	13	22	17	11	14	635	MGWA
Mourning Warbler														1	2	MOWA
Common Yellowthroat	151	89	55	184	195	113	161	268	192	153	72	149	149	64	3760	COYE
American Redstart	186	138	160	296	225	160	183	391	341	258	189	270	321	256	7367	AMRE
Cape May Warbler				3				1						1	5	CMWA
Magnolia Warbler	93	81	75	112	108	73	78	102	95	105	53	130	119	109	2252	MAWA
Bay-breasted Warbler									1						2	BBWA
Yellow Warbler	67	70	131	168	73	59	64	115	84	80	56	82	73	78	2720	YEWA
Blackpoll Warbler	24	18	12	57	50	21	31	31	18	18	14	10	8	11	699	BLPW
Western Palm Warbler					1		1			3					6	WPWA
Myrtle Warbler	38	4	24	7	14	8	27	16	16	8	10	7	5	49	545	MYWA
Unknown Yellow-rumped Warbler	22	57	58	237	155	48	24	62	89	51	89	76	45	83	2046	UYRW
Audubon's Warbler	44	10	96	171	60	22	66	30	24	17	29	1		7	1041	AUWA
Yellow-rumped Warblers	104	71	178	415	229	78	117	108	129	76	128	84	50	139	3632	YRWA
Townsend's Warbler	7	12	16	41	13	10	13	13	11	8	18	12	4	10	398	TOWA
Canada Warbler															1	CAWA
Wilson's Warbler	65	80	43	53	32	46	69	118	77	129	105	68	43	147	2467	WIWA
Le Conte's Sparrow					1										1	LCSP
American Tree Sparrow	1	18			9	11	5	4	9	15	10		5	3	228	ATSP
Chipping Sparrow	4	26	15	18	10	5	9	10	3	2	17	4	6	51	378	CHSP
Clay-colored Sparrow	1	22	9	1	5	18	16	1	7	3	2		2	10	107	CCSP
Brewer's Sparrow		1					2								8	BRSP
Fox Sparrow	4	12	4	6	6	3	6	9	6	5	7	1	4	4	152	FOSP
Slate-colored Junco	2	1	5	1	1	10	4	12	5		4	3		6	101	SCJU
Oregon Junco	39	61	134	55	145	93	67	75	55	62	104	5	132	125	2161	ORJU
Unidentified Dark-eyed Junco	20	65	33	64	45	41	30	61	35	41	49	99	39	40	1261	UDEJ
Dark-eyed Juncos	61	127	172	120	191	144	101	148	95	103	157	107	171	171	3523	DEJU

Appendix 2: Birds Banded in Standard Banding, 1995-2023 (rev. 2022), Mugaha Marsh

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Species ↓	2009 19 Jul - 23 Sep	2010 17 Jul - 23 Sep	2011 19 Jul - 23 Sep	2012 19 Jul - 23 Sep	2013 19 Jul - 23 Sep	2014 19 Jul - 23 Sep	2015 19 Jul - 23 Sep	2016 18 Jul - 23 Sep	2017 19 Jul - 23 Sep	2018 19 Jul - 23 Sep	2019 19 Jul - 23 Sep	2021 19 Jul - 23 Sep	2022 19 Jul - 23 Sep	2023 19 Jul - 23 Sep	Totals 1995- 2023	Code
Cedar Waxwing	27	33	21	29	31	148	46	20	7	8	37	24	22	4	578	CEDW
Lapland Longspur															2	LALO
Ovenbird	2	1	5	5	6	3	11	3	2	5	5	7	12	17	166	OVEN
Northern Waterthrush	119	29	89	431	106	81	96	141	90	77	62	154	80	78	4610	NOWA
Black-and-White Warbler					2							1	6	6	16	BAWW
Tennessee Warbler	16	14	131	118	256	160	180	103	75	23	12	28	26	10	1389	TEWA
Orange-crowned Warbler	163	179	177	301	224	189	218	193	221	177	145	189	111	138	4324	OCWA
Nashville Warbler								1							1	NAWA
MacGillivray's Warbler	32	16	14	21	31	30	22	32	15	13	22	17	11	14	635	MGWA
Mourning Warbler														1	2	MOWA
Common Yellowthroat	151	89	55	184	195	113	161	268	192	153	72	149	149	64	3760	COYE
American Redstart	186	138	160	296	225	160	183	391	341	258	189	270	321	256	7367	AMRE
Cape May Warbler				3				1						1	5	CMWA
Magnolia Warbler	93	81	75	112	108	73	78	102	95	105	53	130	119	109	2252	MAWA
Bay-breasted Warbler									1						2	BBWA
Yellow Warbler	67	70	131	168	73	59	64	115	84	80	56	82	73	78	2720	YEWA
Blackpoll Warbler	24	18	12	57	50	21	31	31	18	18	14	10	8	11	699	BLPW
Western Palm Warbler					1		1			3					6	WPWA
Myrtle Warbler	38	4	24	7	14	8	27	16	16	8	10	7	5	49	545	MYWA
Unknown Yellow-rumped Warbler	22	57	58	237	155	48	24	62	89	51	89	76	45	83	2046	UYRW
Audubon's Warbler	44	10	96	171	60	22	66	30	24	17	29	1		7	1041	AUWA
Yellow-rumped Warblers	104	71	178	415	229	78	117	108	129	76	128	84	50	139	3632	YRWA
Townsend's Warbler	7	12	16	41	13	10	13	13	11	8	18	12	4	10	398	TOWA
Canada Warbler															1	CAWA
Wilson's Warbler	65	80	43	53	32	46	69	118	77	129	105	68	43	147	2467	WIWA
Le Conte's Sparrow					1										1	LCSP
American Tree Sparrow	1	18			9	11	5	4	9	15	10		5	3	228	ATSP
Chipping Sparrow	4	26	15	18	10	5	9	10	3	2	17	4	6	51	378	CHSP
Clay-colored Sparrow	1	22	9	1	5	18	16	1	7	3	2		2	10	107	CCSP
Brewer's Sparrow		1					2								8	BRSP
Fox Sparrow	4	12	4	6	6	3	6	9	6	5	7	1	4	4	152	FOSP
Slate-colored Junco	2	1	5	1	1	10	4	12	5		4	3		6	101	SCJU
Oregon Junco	39	61	134	55	145	93	67	75	55	62	104	5	132	125	2161	ORJU
Unidentified Dark-eyed Junco	20	65	33	64	45	41	30	61	35	41	49	99	39	40	1261	UDEJ
Dark-eyed Juncos	61	127	172	120	191	144	101	148	95	103	157	107	171	171	3523	DEJU

Species ?	1995 11 Aug - 24 Sep	1996 5 Aug - 28 Sep	1997 26 Jul - 26 Sep	1998 21 Jul - 20 Sep	1999 19 Jul - 19 Sep	2000 23 Jul - 24 Sep	2001 22 Jul - 23 Sep	2002 21 Jul - 22 Sep	2003 20 Jul - 21 Sep	2004 20 Jul - 22 Sep	2005 19 Jul - 22 Sep	2006 18 Jul - 23 Sep	2007 19 Jul - 23 Sep	2008 19 Jul - 23 Sep	Code
<i>White-crowned Sparrow</i>	27	42	22			1			7					1	WCSP
<i>Gambel's White-crowned Sparrow</i>				31	31	56	59	52	10	34	26	41	32	17	GWCS
White-crowned Sparrows	27	42	22	31	31	57	59	52	17	34	26	41	32	18	WCSP
Golden-crowned Sparrow				2				1				1	1	1	GCSP
Harris's Sparrow		1													HASP
White-throated Sparrow	6	8	4	9	8	4	9	6	18	10	12	22	24	13	WTSP
Vesper Sparrow						1									VESP
Savannah Sparrow	3	21	30	46	25	35	23	11	4	16	11	23	14	14	SAVS
Song Sparrow	18	13	25	17	16	28	27	17	54	29	27	41	35	19	SOSP
Lincoln's Sparrow	17	19	33	20	57	53	50	11	38	48	24	66	39	18	LISP
Swamp Sparrow	3	2	3	11	2	5	3	2	5	3	1	13	2	3	SWSP
Western Tanager	4	6	11	26	10	6	1	12	29	16	10	12	15	9	WETA
Rose-breasted Grosbeak														1	RBGR
Red-winged Blackbird						2			1	2				2	RWBL
Brown-headed Cowbird			2	4	1	1	2	1	3	3		1	1	3	BHCO
Rusty Blackbird	3	1	5	7	4	1			2	4	2	8	8	6	RUBL
Common Grackle								1							COGR
Evening Grosbeak													1		EVGR
Purple Finch		3	5	7	4	4	2		2	1	2	5	6		PUFI
Cassin's Finch															CAFI
White-winged Crossbill					8								5		WWCR
Pine Siskin	14	95	85	1305	295	210	54	2	373	37	72	6	360	72	PISI
Total Number of Individuals	1001	2064	2799	4013	2531	2247	2336	3002	3346	2388	2758	3184	3092	2549	totals
Total Number of Species	43	64	67	69	62	63	51	56	59	65	56	60	62	68	species
net hours	1851.5	3368	3979.5	4393.8	4314.8	3991.7	4326	4598	3709	4239.5	4396	4442.5	4256	4476.8	net hrs
Birds per net hr	0.5406	0.6128	0.7034	0.9133	0.5866	0.5629	0.5400	0.6529	0.9021	0.5633	0.6274	0.7167	0.7265	0.5694	Birds/net hr

In 1995, 1996 and 1997 the seasons were shorter and the number of nets were less than the standard 12 we use now.

In 2003 we did not band from Aug 18-21 and Aug 25-28 due to hiring new personnel; we had 13 nets all season that year.

Any non-standard banding birds recaptured in Standard Banding are counted in the totals as per station protocol.

In 1995, 1996 and 1997 totals include a small number of birds captured in a ground trap during the standard banding period.

Appendix 2: Birds Banded in Standard Banding, 1995-2023 (rev. 2022), Mugaha Marsh

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Species ↓	2009 19 Jul - 23 Sep	2010 17 Jul - 23 Sep	2011 19 Jul - 23 Sep	2012 19 Jul - 23 Sep	2013 19 Jul - 23 Sep	2014 19 Jul - 23 Sep	2015 19 Jul - 23 Sep	2016 18 Jul - 23 Sep	2017 19 Jul - 23 Sep	2018 19 Jul - 23 Sep	2019 19 Jul - 23 Sep	2021 19 Jul - 23 Sep	2022 19 Jul - 23 Sep	2023 19 Jul - 23 Sep	Totals 1995- 2023	Code
<i>White-crowned Sparrow</i>	1	7	2	19	37	4		13	9	2	11				205	WCSP
<i>Gambel's White-crowned Sparrow</i>	37	31	64	49	19	32	52	84	8	40	45	21	19	59	949	GWCS
White-crowned Sparrows	38	38	66	68	56	36	52	97	17	42	56	21	19	59	1154	WCSP
<i>Golden-crowned Sparrow</i>	2	1	1					1	1					4	16	GCSP
<i>Harris's Sparrow</i>															1	HASP
<i>White-throated Sparrow</i>	17	27	78	108	138	101	69	126	59	95	110	45	58	28	1212	WTSP
<i>Vesper Sparrow</i>															1	VESP
<i>Savannah Sparrow</i>	15	73	36	20	2	12	29	8	9	39	41	6	4	23	593	SAVS
<i>Song Sparrow</i>	40	17	15	32	71	50	39	30	32	21	19	26	15	14	787	SOSP
<i>Lincoln's Sparrow</i>	38	23	66	30	101	70	85	48	42	45	31	21	37	24	1154	LISP
<i>Swamp Sparrow</i>	2	2	3	1	31	15	20	25	10	12	1	14	9	7	210	SWSP
<i>Western Tanager</i>	31	7	15	9	33	82	14	15	5	18	29	23	41	40	529	WETA
<i>Rose-breasted Grosbeak</i>									1	1	1			1	5	RBGR
<i>Red-winged Blackbird</i>	1				2					1		1			12	RWBL
<i>Brown-headed Cowbird</i>	5	1		3	1	3	2	4	2	1				1	45	BHCO
<i>Rusty Blackbird</i>	4	1	1	2	6	5			1	7	2				80	RUBL
<i>Common Grackle</i>															1	COGR
<i>Evening Grosbeak</i>													1		2	EVGR
<i>Purple Finch</i>	3	1	2	9	6	5	17	4	6	12	8	1	18	6	139	PUFI
<i>Cassin's Finch</i>							1								1	CAFI
<i>White-winged Crossbill</i>							2			7					22	WWCR
<i>Pine Siskin</i>	37	16	171	45	31	6	173	43	17	47	93		83		3742	PISI
Total Number of Individuals	2200	2236	2724	3688	3602	3099	3686	3391	2894	2734	3045	2605	2350	2799	78363	totals
Total Number of Species	58	63	59	58	60	58	60	62	58	62	62	52	61	62	115	species
net hours	4727.9	4794.8	4325	4494.25	4381.75	4596	4554.33	4447	4150.5	4454.5	4167.5	4072	4405.8	4547.75	113914.4	net hrs
Birds per net hr	0.4653	0.4663	0.6298	0.8206	0.8218	0.6743	0.8093	0.7623	0.6973	0.6140	0.7311	0.6397	0.5334	0.6155	0.6879	Birds/net hr

In 1995, 1996 and 1997 the seasons were shorter and the number of nets were less than the standard 12 we use now.

In 2003 we did not band from Aug 18-21 and Aug 25-28 due to hiring new personnel; we had 13 nets all season that year.

Any non-standard banding birds recaptured in Standard Banding are counted in the totals as per station protocol.

In 1995, 1996 and 1997 totals include a small number of birds captured in a ground trap during the standard banding period.

Appendix 3: Birds Banded in Non-Standard Banding, 1995-2023 (rev. 2022), Mugaha Marsh

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Species	1994 25-26 Aug. 11-12 Sep.	1998 (5 nets) 16-23 May	1995 11 Aug - 24 Sep	1996 5 Aug. - 28 Sep	1998 21 Jul - 20 Sep	1999 19 Jul - 19 Sep.	2000 23 Jul - 24 Sep	2001 22 Jul - 23 Sep.	2002 21 Jul - 22 Sep	2003 20 Jul - 21 Sep	2004 20 Jul - 22 Sep	2005 19 Jul - 22 Sep	2006 18 Jul - 23 Sep	2007 19 Jul - 23 Sep	2008 19 Jul - 23 Sep	Code
Sharp-shinned Hawk		1														SSHA
American Kestrel					5											AMKE
Killdeer					1											KILL
Solitary Sandpiper															1	SOSA
Semipalmated Sandpiper							2									SESA
Least Sandpiper					1		5								1	LESA
Pectoral Sandpiper											2					PESA
Wilson's Snipe					6		2									WISN
Northern Pygmy-Owl																NOPO
Boreal Owl										2	11		1			BOOW
Northern Saw-whet Owl			17	1	1	2	1		29	84	53	8	106	50	2	NSWO
Calliope Hummingbird												4	2	3	3	CAHU
Rufous Hummingbird												4	5	4	9	RUHU
Belted Kingfisher		2														BEKI
Red-breasted Sapsucker	1															RBSA
Downy Woodpecker								1								DOWO
Yellow-shafted Flicker					1											YSFL
<i>Northern Flicker intergrade</i>																FLIN
Alder Flycatcher	2	1					1	1								ALFL
Least Flycatcher	5	5			2		1	2								LEFL
Hammond's Flycatcher	3				2		11	1								HAFL
Dusky Flycatcher	1	2			1	1	1									DUFL
Western Flycatcher																WEFL
<i>Solitary Vireo</i>					1											SOVI
Cassin's Vireo							1									CAVI
Blue-headed Vireo							1									BHVI
Warbling Vireo		2			2			1								WAVI

Species	2009 19 Jul - 23 Sep	2010 17 Jul - 23 Sep	2011 19 Jul - 23 Sep	2012 19 Jul - 23 Sep	2013 19 Jul - 23 Sep	2014 19 Jul - 23 Sep	2015 19 Jul - 23 Sep	2016 18 Jul - 23 Sep	2017 19 Jul - 23 Sep	2018 19 Jul - 23 Sep	2019 19 Jul - 23 Sep	2021 19 Jul - 23 Sep	2022 19 Jul - Sep 23	2023 19 Jul - Sep 30	1994-2019, 2021-2023 Total	Code
Sharp-shinned Hawk														1	2	SSHA
American Kestrel															5	AMKE
Killdeer															1	KILL
Solitary Sandpiper															1	SOSA
Semipalmated Sandpiper															2	SESA
Least Sandpiper															7	LESA
Pectoral Sandpiper															2	PESA
Wilson's Snipe															8	WISN
Northern Pygmy-Owl						2			1						3	NOPO
Boreal Owl			1			11	5	2	1		6	2			42	BOOW
Northern Saw-whet Owl			7	39	15	50	51	55	30	33	55	108	109	64	970	NSWO
Calliope Hummingbird	11	1		2								2			28	CAHU
Rufous Hummingbird	21	4		4			1					4			56	RUHU
Belted Kingfisher															2	BEKI
Red-breasted Sapsucker															1	RBSA
Downy Woodpecker															1	DOWO
Yellow-shafted Flicker															1	YSFL
<i>Northern Flicker intergrade</i>														1	2	FLIN
Alder Flycatcher														18	23	ALFL
Least Flycatcher														8	23	LEFL
Hammond's Flycatcher														8	25	HAFL
Dusky Flycatcher														7	13	DUFL
Western Flycatcher														1	1	WEFL
Solitary Vireo															1	SOVI
Cassin's Vireo															1	CAVI
Blue-headed Vireo														1	2	BHVI
Warbling Vireo														4	9	WAVI

Species	1994 25-26 Aug. 11-12 Sep.	1998 (5 nets) 16-23 May	1995 11 Aug - 24 Sep	1996 5 Aug. - 28 Sep	1998 21 Jul - 20 Sep	1999 19 Jul - 19 Sep.	2000 23 Jul - 24 Sep	2001 22 Jul - 23 Sep.	2002 21 Jul - 22 Sep	2003 20 Jul - 21 Sep	2004 20 Jul - 22 Sep	2005 19 Jul - 22 Sep	2006 18 Jul - 23 Sep	2007 19 Jul - 23 Sep	2008 19 Jul - 23 Sep	Code
Steller's Jay				4												STJA
Tree Swallow		1					1									TRES
Bank Swallow							2									BANS
Barn Swallow															4	BARS
Black-capped Chickadee	6						9									BCCH
Red-breasted Nuthatch																RBNU
Golden-crowned Kinglet	2				1											GCKI
Ruby-crowned Kinglet	50				6		15	1	1							RCKI
Mountain Bluebird					1											MOBL
Swainson's Thrush	3	4			1		2	1								SWTH
Hermit Thrush	3				1		2									HETH
American Robin		21					2									AMRO
Varied Thrush	1						1									VATH
American Pipit							14									AMPI
Cedar Waxwing						1		2								CEDW
Ovenbird																OVEN
Northern Waterthrush	1	13														NOWA
Tennessee Warbler					1		1	1								TEWA
Orange-crowned Warbler	9	5			1		11	1								OCWA
MacGillivray's Warbler		1						1								MGWA
Common Yellowthroat	6	8					4									COYE
American Redstart	4	6					10	29								AMRE
Magnolia Warbler	2	1					3									MAWA
Yellow Warbler	1	6			1		2									YEWA
Blackpoll Warbler	2	1			5											BLPW
Western Palm Warbler																WPWA

Appendix 3: Birds Banded in Non-Standard Banding, 1995-2023 (rev. 2022), Mugaha Marsh

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Species	2009 19 Jul - 23 Sep	2010 17 Jul - 23 Sep	2011 19 Jul - 23 Sep	2012 19 Jul - 23 Sep	2013 19 Jul - 23 Sep	2014 19 Jul - 23 Sep	2015 19 Jul - 23 Sep	2016 18 Jul - 23 Sep	2017 19 Jul - 23 Sep	2018 19 Jul - 23 Sep	2019 19 Jul - 23 Sep	2021 19 Jul - 23 Sep	2022 19 Jul - Sep 23	2023 19 Jul - Sep 30	1994-2019, 2021-2023 Total	Code
Steller's Jay															4	STJA
Tree Swallow															2	TRES
Bank Swallow															2	BANS
Barn Swallow															4	BARS
Black-capped Chickadee														5	20	BCCH
Red-breasted Nuthatch														4	3	RBNU
Golden-crowned Kinglet														47	49	GCKI
Ruby-crowned Kinglet														100	173	RCKI
Mountain Bluebird															1	MOBL
Swainson's Thrush														19	30	SWTH
Hermit Thrush														1	7	HETH
American Robin														9	32	AMRO
Varied Thrush														1	3	VATH
American Pipit															14	AMPI
Cedar Waxwing															3	CEDW
Ovenbird														2	2	OVEN
Northern Waterthrush														4	18	NOWA
Tennessee Warbler														2	5	TEWA
Orange-crowned Warbler														22	49	OCWA
MacGillivray's Warbler														2	4	MGWA
Common Yellowthroat														11	29	COYE
American Redstart														30	79	AMRE
Magnolia Warbler														10	16	MAWA
Yellow Warbler														2	12	YEWA
Blackpoll Warbler															8	BLPW
Western Palm Warbler														1	1	WPWA

Appendix 3: Birds Banded in Non-Standard Banding, 1995-2023 (rev. 2022), Mugaha Marsh

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Species	1994 25-26 Aug. 11-12 Sep.	1998 (5 nets) 16-23 May	1995 11 Aug - 24 Sep	1996 5 Aug. - 28 Sep	1998 21 Jul - 20 Sep	1999 19 Jul - 19 Sep.	2000 23 Jul - 24 Sep	2001 22 Jul - 23 Sep.	2002 21 Jul - 22 Sep	2003 20 Jul - 21 Sep	2004 20 Jul - 22 Sep	2005 19 Jul - 22 Sep	2006 18 Jul - 23 Sep	2007 19 Jul - 23 Sep	2008 19 Jul - 23 Sep	Code
Unk. Yellow-rumped Warbler					3		4									UYRW
Myrtle Warbler	3	4			7		2	1								MYWA
Audubon's Warbler	12	13			3		1		1							AUWA
<i>Total Yellow-rumped Warbler</i>	<i>15</i>	<i>17</i>			<i>13</i>		<i>7</i>	<i>1</i>	<i>1</i>							YRWA
Townsend's Warbler	5				1		2									TOWA
Wilson's Warbler	5	28			1		18									WIWA
American Tree Sparrow																ATSP
Chipping Sparrow																CHSP
Clay-colored Sparrow																CCSP
Savannah Sparrow	2	2			2		1									SAVS
Fox Sparrow	1															FOSP
Song Sparrow	2	3					4	1								SOSP
Lincoln's Sparrow	4	4					10									LISP
Swamp Sparrow	2						1									SWSP
White-throated Sparrow							1									WTSP
White-crowned Sparrow	4															WCSP
Gambel's White-crowned Sparrow					3		8									GWCS
Slate-colored Junco	1															SCJU
Oregon Junco	4				8		1	2								ORJU
Unidentified Dark-eyed Junco	2															UDEJ
<i>Total Dark-eyed Junco</i>	<i>7</i>				<i>8</i>		<i>1</i>	<i>2</i>								DEJU
Red-winged Blackbird		5			1											RWBL
Rusty Blackbird		1			1		2									RUBL
Brown-headed Cowbird		2					1									BHCO
Purple Finch		9														PUFI
Common Redpoll							1									CORE
Pine Siskin	1	5			25			9								PISI
Total Number of Individuals	150	156	17	1	95	4	162	55	31	86	66	16	114	57	20	Total
Total Number of Species	28	26	1	1	27	3	38	16	3	2	3	3	4	3	6	# Species

Species	2009 19 Jul - 23 Sep	2010 17 Jul - 23 Sep	2011 19 Jul - 23 Sep	2012 19 Jul - 23 Sep	2013 19 Jul - 23 Sep	2014 19 Jul - 23 Sep	2015 19 Jul - 23 Sep	2016 18 Jul - 23 Sep	2017 19 Jul - 23 Sep	2018 19 Jul - 23 Sep	2019 19 Jul - 23 Sep	2021 19 Jul - 23 Sep	2022 19 Jul - Sep 23	2023 19 Jul - Sep 30	1994-2019, 2021-2023 Total	Code
Unk. Yellow-rumped Warbler														39	46	UYRW
Myrtle Warbler														21	38	MYWA
Audubon's Warbler														1	31	AUWA
<i>Total Yellow-rumped Warbler</i>														62	116	YRWA
Townsend's Warbler														1	9	TOWA
Wilson's Warbler														22	74	WIWA
American Tree Sparrow														4	4	ATSP
Chipping Sparrow														2	2	CHSP
Clay-colored Sparrow														1	1	CCSP
Savannah Sparrow														1	8	SAVS
Fox Sparrow															1	FOSP
Song Sparrow														2	12	SOSP
Lincoln's Sparrow														4	22	LISP
Swamp Sparrow														1	4	SWSP
White-throated Sparrow															1	WTSP
White-crowned Sparrow															4	WCSP
Gambel's White-crowned Sparrow														15	26	GWCS
Slate-colored Junco														2	3	SCJU
Oregon Junco														18	33	ORJU
Unidentified Dark-eyed Junco														2	4	UDEJ
<i>Total Dark-eyed Junco</i>														22	40	DEJU
Red-winged Blackbird															6	RWBL
Rusty Blackbird															4	RUBL
Brown-headed Cowbird															3	BHCO
Purple Finch															9	PUFI
Common Redpoll															1	CORE
Pine Siskin															40	PISI
Total Number of Individuals	32	5	8	45	15	63	57	57	32	33	61	116	109	518	2203	Total
Total Number of Species	2	2	2	3	1	3	3	2	3	1	2	4	1	40	70	# Species

Appendix 4: Birds captured in Standard Banding, by Net, Fall 2023, Mugaha Marsh

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Species/Net	3	9	11	12	17	19	20	21	22	25	26	32	U	Total	Species
ALFL	9	3	15	17	8	6	9	3	7	6	3	16		104	ALFL
AMRE	6	21	11	14	30	22	34	22	28	21	14	33		256	AMRE
AMRO	2	1	2	8							2	9		24	AMRO
ATSP	3													3	ATSP
AUWA	1		3							1	1	1		7	AUWA
BARS			1											1	BARS
BAWW					1	1	3				1			6	BAWW
BCCH	2		6	3	5					1	7	5		32	BCCH
BHCO				1										1	BHCO
BHVI				1										1	BHVI
BLPW		3						1			1	6		11	BLPW
BWHA			1											1	BWHA
CAVI				1							1			2	CAVI
CCSP	1		4	3	1				1					10	CCSP
CEDW			2	2										4	CEDW
CHSP			20	28						1	1			51	CHSP
CMWA						1								1	CMWA
COYE	3	1	8	28	1		8	3	3	5	3	1		64	COYE
DUFL	9	2	4	9	4				2	3	4	9		46	DUFL
EAKI				4										4	EAKI
EUST				1										1	EUST
FLIN						1								1	FLIN
FOSP						1		1		1		1		4	FOSP
GCKI	3	6	4	6	17	12	15	9	4	35	49	53		213	GCKI
GCSP						1		1	1			1		4	GCSP
GCTH										1				1	GCTH
GWCS	5	5	3	11	1	6	1	6	1	4	8	8		59	GWCS
HAFL	8	2	4	7	4		5	1	2	4	5	4		46	HAFL
HETH		1			1		3	1		2	4	2		14	HETH
HYSA											1			1	HYSA
LEFL	2	3	6	14	7	7	2	2	9	1	8	10		71	LEFL
LISP	5	2	2	8	1	1			1		2	1		24	LISP
MAWA	2	6	3	2	4	8	20	9	8	11	15	20	1	109	MAWA
MGWA	2			2		1			2		1	6		14	MGWA
MOWA				1										1	MOWA
MYWA	9		3	2	8	5	3	3	1	4	3	7		49	MYWA

Appendix 4: Birds captured in Standard Banding, by Net, Fall 2023, Mugaha Marsh

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Species/Net	3	9	11	12	17	19	20	21	22	25	26	32	U	Total	Species
NOWA		8	5	17	7	8	2	4	9	10	4	4		78	NOWA
OCWA	9	2	7	16	12	14	9	13	10	4	6	35		138	OCWA
ORJU	12	11	11	15	10	2	4	4	2	13	25	16		125	ORJU
OVEN		1	1		1	2	1	5	2		3	1		17	OVEN
PAWR											2			2	PAWR
PUFI	1		2							1	2			6	PUFI
RBGR				1										1	RBGR
RBNU	2				2							1		5	RBNU
RBSA			1	1						1		4		7	RBSA
RCKI	20	11	12	24	30	19	17	28	15	40	36	73		334	RCKI
REVI			1			1			1					3	REVI
RSFL								1						1	RSFL
SAVS			9	9	2				3					23	SAVS
SCJU		1	2	1							2			6	SCJU
SOSP	1	1		6		1				1	2	2		14	SOSP
SWSP	2		2	2	1									7	SWSP
SWTH	3	29	4	9	29	17	17	13	19	33	35	63	1	273	SWTH
TEWA			1	2		1		1	2		1	2		10	TEWA
TOWA	1			2		1				1	2	3		10	TOWA
TRES			1											1	TRES
TRFL										1				1	TRFL
UDEJ	6		3	7	2	1	1	2		5	3	9	1	40	UDEJ
UYRW	18	2	3	4	8	7	5	6	2	9	8	11		83	UYRW
VATH						1	1	1	1		1	2		7	VATH
WAVI	3	2	7	9	2	1	3	4	2		2	22		57	WAVI
WEFL								1					1	2	WEFL
WETA		2	1	3	1		3		2	1	3	23	1	40	WETA
WEWP				2										2	WEWP
WIWA	8	9	18	19	17	11	19	10	4	4	10	17		147	WIWA
WTSP		3			1	1	3	2	1		6	11		28	WTSP
YBFL	1			2		1					1			5	YBFL
YBSA			1	1	1		1		1	1	1			7	YBSA
YEWA	9	4	5	17	2	4	4	11	10	1	3	8		78	YEWA
Total	168	142	199	342	220	166	194	168	156	227	292	500	5	2799	Total
Net Hours	363.75	385.50	360.75	380.25	385.00	384.00	384.00	381.25	381.25	383.75	372.25	386.00	-	4547.75	Net Hours
Birds/net hr	0.4619	0.3684	0.5516	0.8994	0.5714	0.4323	0.5052	0.4407	0.4092	0.5915	0.7844	1.2953	-	0.6155	Birds/net hr

Appendix 5: Returns, by Net, Standard Banding, Fall 2023, Mugaha Marsh
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Species / Net #	3	11	12	17	19	20	21	22	25	26	32	Total	
Alder Flycatcher				1	1							2	ALFL
American Redstart					2		1	1				4	AMRE
Black and White Warbler								1				1	BAWW
Black-capped Chickadee			1						2	1		4	BCCH
Common Yellowthroat	1		1									2	COYE
Dark-eyed Junco (Oregon)											2	2	DEJU
Dusky Flycatcher										1		1	DUFL
Lincoln's Sparrow		1	1									2	LISP
MacGillivray's Warbler									1			1	MGWA
Magnoila Warbler									1		1	2	MAWA
Norther Waterthrush					1	1		2				4	NOWA
Orange-crowned Warbler						2			1		2	5	OCWA
Red-eyed Vireo			1									1	REVI
Ruby-crowned Kinglet									1			1	RCKI
Swainson's Thrush				1						1	1	3	SWTH
Warbling Vireo			1							1		2	WAVI
Western Tanger											1	1	WETA
White-throated Sparrow					1					1	1	3	WTSP
Yellow Warbler		1										1	YEWA
Yellow-rumped Warbler									1		1	2	YRWA
	1	2	5	1	5	3	1	3	7	5	9	44	Total

Band Number	Species	Age	Sex	Date	Net	Time	Bander ID
Return from 2014							
2691-72075	Western Tanger	HY	U	2014-08-06	25	8:45	CAS
2691-72075		AHY	F	2023-08-11	32	6:00	KLL
Return from 2017							
2780-82191	Yellow Warbler	HY	U	2017-07-25	19	6:00	DRF
2780-82191		AHY	F	2022-08-12	3	8:30	ZJR
2780-82191		AHY	F	2023-07-19	11	6:00	LAT
2780-82191		AHY	F	2023-07-21	3	10:30	KLL
2780-82191		AHY	F	2023-08-05	26	7:15	LAT
Returns from 2018							
2780-83346	Orange-crowned Warbler	AHY	M	2018-08-18	32	8:45	NAP
2780-83346		AHY	F	2023-09-08	20	7:00	LAT
2790-68063	Ruby-crowned Kinglet	AHY	M	2018-08-30	21	7:30	NAP
2790-68063		AHY	M	2021-09-03	32	9:15	KAS
2790-68063		AHY	M	2023-07-27	25	7:00	LAT
2741-77863	Swainson's Thrush	AHY	M	2018-08-15	32	7:15	CAS
2741-77863		AHY	U	2023-08-26	32	10:30	KAS
Returns from 2019							
2860-09448	Orange-crowned Warbler	AHY	F	2019-07-22	11	6:30	JK
2860-09448		AHY	U	2021-08-01	26	7:15	ZJR
2860-09448		AHY	U	2022-07-20	26	9:30	LAT
2860-09448		AHY	U	2023-07-24	25	6:00	LAT
2771-82373	White-throated Sparrow	AHY	U	2019-07-30	32	10:45	JK
2771-82373		AHY	F	2019-08-04	3	7:45	JK
2771-82373		AHY	U	2023-07-20	32	5:30	LAT
2950-41018	Alder Flycatcher	AHY	F	2022-07-19	26	8:00	ZJR
2950-41018		AHY	F	2022-07-20	26	7:30	LAT
2950-41018		AHY	F	2022-07-21	3	6:00	LAT
2950-41018		AHY	F	2023-07-30	17	7:15	LAT
2950-41018		AHY	F	2023-08-01	19	8:15	BDB
Returns from 2021							
2930-18868	American Redstart	AHY	F	2021-07-23	25	5:00	ZJR
2930-18868		AHY	F	2021-07-29	32	6:15	KAM
2930-18868		AHY	F	2022-09-05	21	8:45	ZJR
2930-18868		AHY	F	2023-08-07	19	7:30	BDB
2930-18868		ASY	F	2023-08-25	20	7:30	LAT
2930-18868		AHY	F	2023-08-28	19	11:30	BDB
2930-19094	American Redstart	ASY	M	2021-08-08	19	8:30	LAT
2930-19094		ASY	M	2023-08-10	19	7:30	KLL
2930-19243	American Redstart	HY	U	2021-08-15	17	8:15	KAM
2930-19243		AHY	F	2022-09-01	32	12:15	JAR
2930-19243		AHY	F	2023-09-04	21	7:45	LAT

Appendix 6: Details of Returns in SB, Fall 2023, Mugaha Marsh **Page 2 of 4**

Returns from 2021 (continuing)							
2930-19333	American Redstart	AHY	F	2021-08-19	20	8:45	ZJR
2930-19333		AHY	F	2022-07-29	19	5:45	ZJR
2930-19333		AHY	F	2023-08-30	22	7:30	BDB
2920-55494	Black-capped Chickadee	AHY	F	2021-07-22	9	6:00	KAM
2920-55494		AHY	U	2021-07-26	17	7:30	KAM
2920-55494		AHY	U	2021-07-29	32	11:45	KAM
2920-55494		AHY	U	2021-08-21	17	9:45	LAT
2920-55494		AHY	U	2021-09-08	11	7:30	KAM
2920-55494		AHY	F	2022-08-01	26	7:15	LAT
2920-55494		AHY	U	2022-08-26	26	8:30	ZJR
2920-55494		AHY	U	2022-09-10	32	7:30	KLL
2920-55494		AHY	U	2022-09-16	26	10:45	KLL
2920-55494		AHY	U	2023-08-27	25	7:00	LAT
2920-55494		AHY	U	2023-09-21	21	11:15	KLL
2621-91115	Dark-eyed Junco (Oregon)	AHY	U	2021-07-24	3	9:30	ZJR
2621-91115		AHY	M	2021-07-29	32	6:15	KAM
2621-91115		AHY	U	2021-08-12	26	10:00	LAT
2621-91115		AHY	F	2021-09-02	26	12:15	LAT
2621-91115		AHY	M	2021-09-22	26	9:45	ZJR
2621-91115		AHY	M	2023-08-31	32	9:45	KLL
2621-91115		AHY	M	2023-09-11	32	10:30	JAC
2930-19415	Magnolia Warbler	HY	U	2021-08-23	9	12:00	KAS
2930-19415		AHY	F	2023-07-20	25	7:00	LAT
2920-55640	MacGillivray's Warbler	HY	U	2021-07-29	26	8:45	KAM
2920-55640		AHY	M	2023-08-17	25	7:15	KLL
2920-55474	Northern Waterthrush	AHY	U	2021-07-20	12	10:00	KAM
2920-55474		AHY	U	2021-08-24	22	9:00	KAM
2920-55474		AHY	U	2022-07-21	12	8:00	ZJR
2920-55474		AHY	U	2022-07-28	12	7:45	ZJR
2920-55474		AHY	U	2022-08-13	12	6:00	ZJR
2920-55474		AHY	U	2022-08-16	22	7:45	KLL
2920-55474		AHY	U	2023-08-04	19	6:45	KLL
2920-55474		AHY	M	2023-08-08	22	10:00	BDB
2920-55474		AHY	M	2023-08-13	20	8:00	BDB
2920-55474		AHY	M	2023-08-16	17	6:45	JAR
2920-55474		AHY	U	2023-08-23	22	7:00	KLL
2920-55803	Northern Waterthrush	AHY	U	2021-08-10	22	8:00	ZJR
2920-55803		AHY	U	2021-08-16	22	6:45	ZJR
2920-55803		AHY	U	2022-08-12	20	6:30	ZJR
2621-91378	replacement band	AHY	M	2023-08-10	20	6:00	KLL

Appendix 6: Details of Returns in SB, Fall 2023, Mugaha Marsh Page 3 of 4

Returns from 2021 (continuing)							
2771-82823	Swainson's Thrush	AHY	U	2021-07-19	19	5:30	LAT
2771-82823		AHY	U	2021-07-21	21	10:00	SJK
2771-82823		AHY	U	2021-08-29	22	7:00	KAM
2771-82823		AHY	U	2022-07-27	17	7:03	LAT
2771-82823		AHY	U	2023-07-24	19	9:03	LAT
2771-82896	Swainson's Thrush	AHY	F	2021-07-25	9	5:30	KAM
2771-82896		AHY	U	2023-07-19	26	6:00	LAT
2771-82896		AHY	U	2023-08-01	9	5:45	BDB
2920-55522	Warbling Vireo	AHY	F	2021-07-23	19	11:00	ZJR
2920-55522		AHY	U	2023-07-21	12	9:30	LAT
2920-55522		AHY	U	2023-07-22	25	7:00	LAT
2920-55592	Warbling Vireo	AHY	U	2021-07-26	20	11:00	ZJR
2920-55592		AHY	U	2023-07-30	22	10:15	BDB
2920-55760	Warbling Vireo	AHY	F	2021-08-06	21	6:45	LAT
2920-55760		AHY	U	2023-07-24	26	7:00	KAS
2920-55760		AHY	U	2023-07-27	3	11:00	LAT
2771-82913	White-throated Sparrow	HY	U	2021-07-27	20	9:30	ZJR
2771-82913		HY	U	2021-08-01	19	7:45	ZJR
2771-82913		AHY	F	2022-07-20	9	7:30	LAT
2771-82913		AHY	U	2023-09-05	19	10:15	BDB
2920-55421	Yellow-rumped Warbler	AHY	F	2021-07-19	3	5:30	LAT
2920-55421	(Audubon's)	AHY	F	2023-08-23	32	6:30	KLL
Returns from 2022							
2950-41047	Alder Flycatcher	AHY	U	2022-07-22	12	7:30	ZJR
2950-41047		AHY	U	2022-07-25	22	11:00	ZJR
2950-41047		AHY	U	2023-08-01	19	8:15	BDB
2950-41012	Black-and-white Warbler	AHY	F	2022-07-19	22	7:00	ZJR
2950-41012		AHY	F	2022-08-06	22	9:00	ZJR
2950-41012		AHY	F	2023-08-21	22	7:45	LAT
2960-49570	Black-capped Chickadee	HY	U	2022-07-28	12	9:45	ZJR
2960-49570		HY	U	2022-08-25	17	7:00	KLL
2960-49570		HY	U	2022-09-13	19	7:30	ZJR
2960-49570		AHY	U	2023-08-23	26	7:30	LAT
2960-49570		AHY	U	2023-09-16	21	7:45	KLL
2960-49570		AHY	U	2023-09-21	19	11:15	KLL
2960-49612	Black-capped Chickadee	AHY	F	2022-07-30	3	8:45	LAT
2960-49612		AHY	U	2022-08-16	22	7:45	LAT
2960-49612		AHY	U	2022-08-28	32	10:00	CDC
2960-49612		AHY	U	2022-09-01	32	6:45	ZJR
2960-49612		AHY	U	2022-09-16	26	10:45	KLL
2960-49612		AHY	U	2023-08-24	12	11:30	BDB
2960-49612		AHY	U	2023-09-14	26	7:30	KLL
2960-49612		AHY	U	2023-09-21	19	11:15	KLL
2960-49832	Black-capped Chickadee	HY	U	2022-08-19	25	9:15	KLL
2960-49832		HY	U	2022-09-04	21	11:45	KLL
2960-49832		HY	U	2022-09-18	22	7:15	ZJR
2960-49832		AHY	U	2023-08-23	25	7:30	LAT

Returns from 2022 (continuing)							
2960-49429	Common Yellowthroat	AHY	F	2022-07-22	12	5:30	ZJR
2960-49429		AHY	F	2023-09-05	12	9:45	LAT
2960-49568	Common Yellowthroat	AHY	F	2022-07-28	11	8:45	ZJR
2960-49568		AHY	F	2023-07-24	3	6:00	LAT
2960-51233	Dark-eyed Junco (Oregon)	HY	F	2022-09-17	17	10:45	KAS
2960-51233		AHY	M	2023-07-19	32	9:00	LAT
2960-51233		AHY	M	2023-09-02	22	6:45	KAS
2950-41017	Dusky Flycatcher	AHY	F	2022-07-19	9	7:30	LAT
2950-41017		AHY	F	2022-07-24	32	10:30	ZJR
2950-41017		AHY	F	2023-07-21	26	11:00	KLL
2621-91238	Lincoln's Sparrow	AHY	U	2022-08-11	12	11:00	ZJR
2621-91238		AHY	U	2023-07-27	12	7:30	LAT
2621-91270	Lincoln's Sparrow	AHY	U	2022-08-31	12	8:45	JAR
2621-91270		AHY	M	2023-07-21	11	8:00	KAS
2950-41071	Magnolia Warbler	AHY	F	2022-07-23	26	9:00	ZJR
2950-41071		AHY	F	2022-07-27	9	8:00	LAT
2950-41071		AHY	F	2022-08-05	32	7:45	LAT
2950-41071		AHY	F	2022-09-02	32	11:45	JAR
2950-41071		SY	F	2023-07-22	32	8:30	LAT
2960-49651	Northern Waterthrush	AHY	U	2022-08-01	21	9:45	LAT
2960-49651		AHY	U	2022-08-14	19	9:45	KLL
2960-49651		AHY	F	2023-07-20	22	8:00	BDB
2960-49436	Orange-crowned Warbler	AHY	M	2022-07-22	3	7:30	LAT
2960-49436		AHY	M	2023-09-12	20	12:00	LAT
2960-49564	Orange-crowned Warbler	AHY	M	2022-07-28	26	5:45	ZJR
2960-49564		AHY	F	2023-07-22	32	7:00	LAT
2960-49803	Orange-crowned Warbler	HY	U	2022-08-16	32	7:45	LAT
2960-49803		AHY	F	2023-08-21	32	6:45	LAT
2621-91230	Red-eyed Vireo	AHY	F	2022-08-06	22	10:00	ZJR
2621-91230		AHY	U	2023-07-24	12	8:00	LAT
2981-61382	White-throated Sparrow	AHY	U	2022-09-12	26	8:00	KLL
2981-61382		AHY	U	2023-08-14	26	7:00	LAT
2960-51156	Yellow-rumped Warbler	AHY	M	2022-09-12	3	10:00	KLL
2960-51156	(Audubon's)	AHY	M	2023-09-13	25	10:30	BDB
Banders: BDB - Benjamin Breton; CAS Chris Sukha; CDC - Christopher Coxson; DRF - Devin Fischer; JAC - Jessica Curry; JAR - Jeannine Randall; JK - Janos Kovacs; KAM - Kristen Mancuso; KAS - Kalum Srochenski; KLL - Kirstin Lavolette Lachance; LAT - Laura Tabbakh; MLC - Maya Longpre-Croteau; SJK - Sandra Kinsey; SMC - Sara Chambers; and ZJR - Zoe Roberts							
Age Codes : HY - Hatch Year, AHY - After Hatch Year, ASY - After Second Year							
Sex Codes: M - Male, F - Female, U - Unknown Sex							

Appendix 7: All Returns, Fall, Standard Banding, 1996 – 2023, Mugaha Marsh

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Species	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2021	2022	2023	Total	Species
ALFL		6	3	3	1	2	3	4	2	2	1	1			1	1			2	2	2	3	3	3	2	1	2	50	ALFL
ALFL/LEFL																			1									1	ALFL/LEFL
AMRE	1	17	16	10	12	11	12	14	12	15	14	10	9	5	5	2	9	4	4	4	9	8	6	5	6	10	4	234	AMRE
AMRO			2					1	1				3		1									1				9	AMRO
BAWW																											1	1	BAWW
BCCH	1		3	1	2	1		2	2		5	1	2	1	4		2	4	5				1	3		1	4	45	BCCH
CCSP																		2		1								3	CCSP
CEDW																				1					5			1	CEDW
COYE		1	4	2		1		1	5	1	2	4	1		2	3	1	1	10	3	4	5	11	4	1	3	2	72	COYE
DEJU	2	4	4	2	4	2	5	2	2	7	2	2	1	1	1				2	2	1				1	2	2	51	DEJU
DOWO							1			1	2	2	2				1				1							10	DOWO
DUFL								1		3										1	3			1			1	10	DUFL
GWCS																					1							1	GWCS
HAFL														1					1									2	HAFL
HAWO													2															2	HAWO
HETH							1															1	1					3	HETH
LEFL		1		3	2	2	2		1		1	2	1	1	1	1	1			1	2	1						23	LEFL
LEFL/DUFL		1																										1	LEFL/DUFL
LISP									1		1	1					1	3	2	4		1					2	16	LISP
MAWA									1	2	2					2	1		1		3			1			2	15	MAWA
MGWA																											1	1	MGWA
NOFL				2	1						1		1															5	NOFL
NOWA	2	12	10	17	3	2	2	6	11	9	11	14	6	6	2		2	3	2		1	2	2		2	4	3	134	NOWA
OCWA		1	2	3	2		1	2		2	1	1	2	3	4	3	6	7	9	8	6	2	10	1	2	3	5	86	OCWA
PISI			2	1																								3	PISI
PUFI																										3		3	PUFI
RBNU												1																1	RBNU
RBSA									1																			1	RBSA
RCKI			1	1						1	1			1			2					1		1	1		1	11	RCKI
REVI				1			1	2	1	2									1								1	9	REVI
RUBL																		1										1	RUBL
SSHA			1																							1		2	SSHA
SOSP	2	3	4	2	1	2		2	4	5	4	4	2	1	3	4	5	4	8	7	4	8	3	2				84	SOSP
SOVI/CAVI	1			1	1					2	3	1									1		1					11	SOVI/CAVI
SWSP																							1					1	SWSP
SWTH						1	4	5	2	3	3	2	8	5	2	4	3	2	5	1	3	6	3	5	6	6	3	82	SWTH
TEWA																				1			1					2	TEWA
WAVI			3	1	1	1	1	2			2	1	3	1	1	3	2	1		5	4	1	1	4			3	41	WAVI
WETA								1	1			1	1	1	1							1					1	8	WETA
WTSP													1			3		1	3	2	4	5	3	1	1	4	3	31	WTSP
YBSA													1						1					1				3	YBSA
YEWA	1	5	4	12	7	5	1	8	10	8	6	8	11	3	7	2	4	5	6	4	6	4	3	1	2	4	1	138	YEWA
YRWA		2	5	2	1	2			3	1	2	1			1	1			2	4	4	2		1	1	1	2	40	YRWA
Total	10	53	64	64	38	32	34	53	60	64	64	57	57	31	36	28	40	40	63	53	59	51	50	35	25	43	44	1248	Total
NSWO											1	1							1	1								4	NSWO
NOPO																								1				1	NOPO