GNWT Wildlife Research Permit
Background & Project update

Permit #: N/A
Title: *NWT Biodiversity Monitoring Program:* Tłı̨chǫ *Winter Road*
Main Investigators:

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Northwest Territories Biodiversity Monitoring (NWTBM) program & winter/ice roads fieldwork

Maintaining biodiversity is important for ecosystem health and community well-being. With ongoing impacts of climate change, human disturbance, and industry, long-term monitoring programs are required to understand the current state of and changes in wildlife populations. This is needed to inform sound and collaboratively developed management and conservation actions. Activities proposed under this Wildlife Research Permit form part of a growing Northwest Territories Biodiversity Monitoring (NWTBM) program; a collaborative initiative aimed at enhancing structured, passive wildlife monitoring across the Northwest Territories.

Under the NWTBM, two primary types of sensors are being deployed: acoustic recording units (ARUs) and wildlife cameras. ARUs record the soundscape on a pre-programmed schedule, whereas cameras take photos when triggered by animal movements. Both sensor types can be left out on the land for an extended period of time or moved around. ARUs can detect a variety of vocalizing animals, including birds, wolves, insects, and amphibians. Migratory bird data collected by ARUs helps to fulfill Environment and Climate Change Canada's (ECCC) obligations to monitor and conserve migratory bird populations (Migratory Birds Act, 1994) and protect threatened species (Species at Risk Act, 2002). Wildlife cameras can detect a variety of medium to large-sized vertebrates, including large mammals, meso-carnivores, fur-bearing species, as well as waterfowl and other migratory and non-migratory birds. Data collected by cameras can support wildlife management and protected area planning within the Northwest Territories.

The NWTBM started in Ts'udé Nilįné Tuyeta Indigenous Protected Area and has since been followed by programs in Edéhzhíe Dehcho Protected Area and National Wildlife Area, Dınàgà Wek'èhodì candidate area, Thaidene Nëné Indigenous Protected Area, along the Sambaa K'e winter road, and within ~ 100 km of the communities of Norman Wells and Fort Smith. Guardians and other Indigenous partners have been actively involved in all aspects of development and implementation of these programs (Figure 1). As part of the most recent programs in Norman Wells and Fort Smith, bat meters and temperature loggers were also deployed/retrieved.

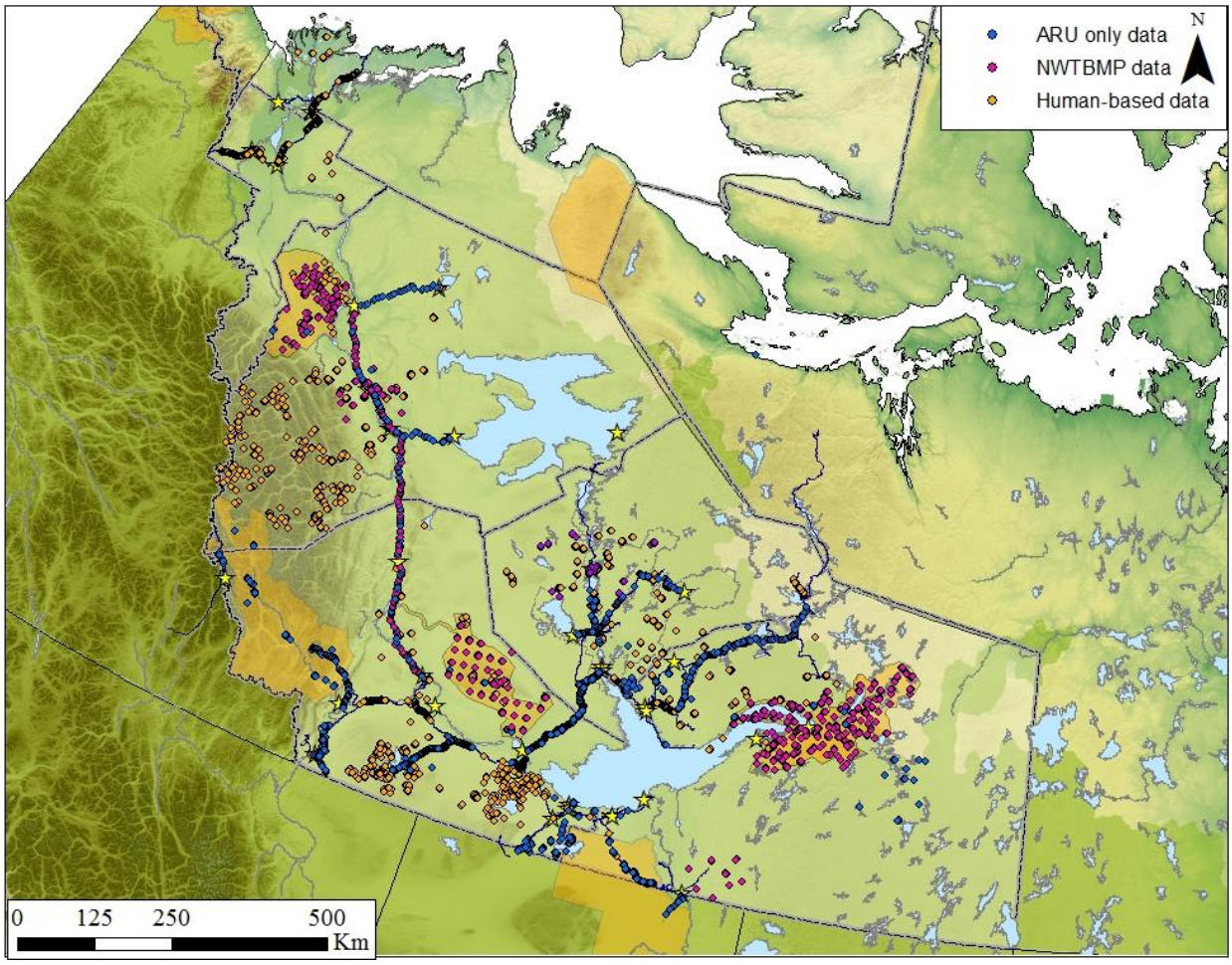

Figure 1*: Map of sampling locations across NWT. In* ***purple*** *are sampling locations where the NWT Biodiversity Monitoring Program has been successfully implemented to date (deployment of both ARUs and wildlife cameras). In* ***blue*** *are sampling locations with ARU only deployments and in* ***red*** *are sampling locations with human-based avian point count data.*

Since 2015, the Canadian Wildlife Service/Environment and Climate Change Canada, in collaboration with a growing number of Indigenous partners, has been implementing a monitoring program along winter/ice roads across NWT to expand monitoring coverage in a cost-effective way (Figures 1 & 2). Below is an overview of the sampling effort for each winter road:

- **March 2015**: The program was initiated along the Tibbitt to Contwoyto winter road northeast of Yellowknife, where 10 ARUs were deployed as a pilot study. These units were programmed to be inactive throughout the remaining winter and reactivated to record when migratory birds returned to the region (June).
- **February 2016**: after the success of the pilot study, the program expanded to 100 ARUs along the same winter road.
- **March 2017**: program expanded to include the Mackenzie Valley winter road (Dehcho & Sahtú 164 ARUs)
- **March 2018**: program expanded to include the Sambaa K'e winter road (177 ARUs).
- **March 2019**: program expanded to include the Tłı̨chǫ winter road (170 ARUs; Figs. 2-3).
- **February 2021**: 100 ARUs were deployed along the Tibbitt to Contwoyto winter road to revisit some of the sampling stations surveyed in 2016 and 2017, and to increase the number of sampling stations.
- **March 2022**: 177 ARUs and 30 wildlife cameras were deployed along the Sambaa K'e winter road to conduct a second round of surveys for this winter road and start documenting changes.
- **March 2023:** 155 ARUs, 85 wildlife cameras, 16 temperature loggers, and 8 bat meters were deployed along the Mackenzie Valley winter road from Fort Simpson to Fort Good Hope. Note that no units were deployed on Deline and Colville Lake's traditional territory.

Proposed 2024 fieldwork along the Tłı̨chǫ winter road

In 2024, we propose to deploy acoustic recording units (ARUs) and wildlife cameras at approximately 170 sampling locations located in different habitat types along the Tłı̨chǫ winter road (Fig. 4; Appendices 1-3). We also propose to deploy bat meters and temperature loggers at a subset of sampling locations (~ 30).

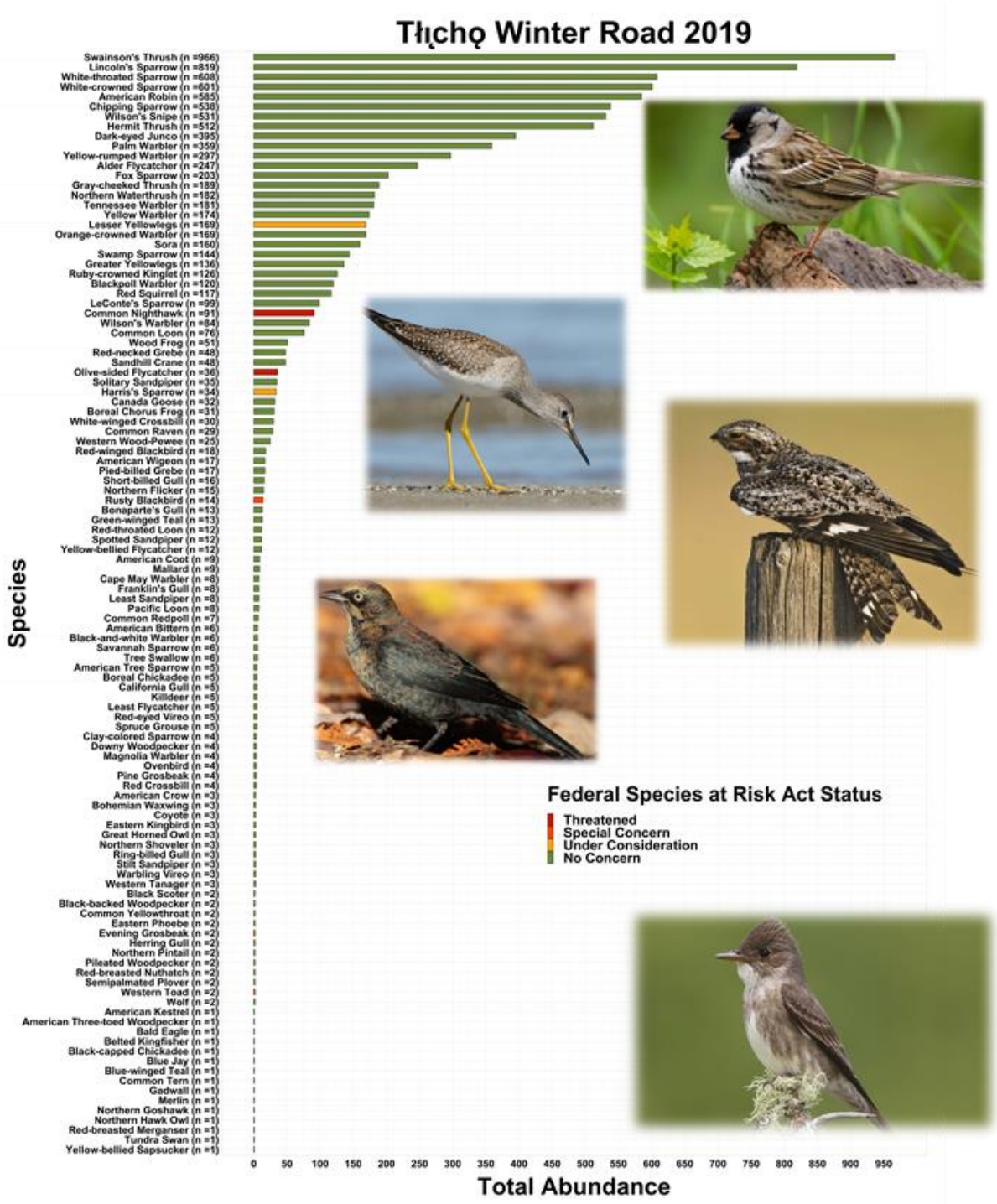

Figure 2*: Total abundance for all 112 landbird species detected in 2019 (only ARUs were deployed) along the Tłı̨chǫ winter road. From top to bottom are pictures of the Harris' Sparrow, Lesser Yellowlegs, Common Nighthawk, Rusty Blackbird, and Olive-sided Flycatcher, all species at risk in Canada.*

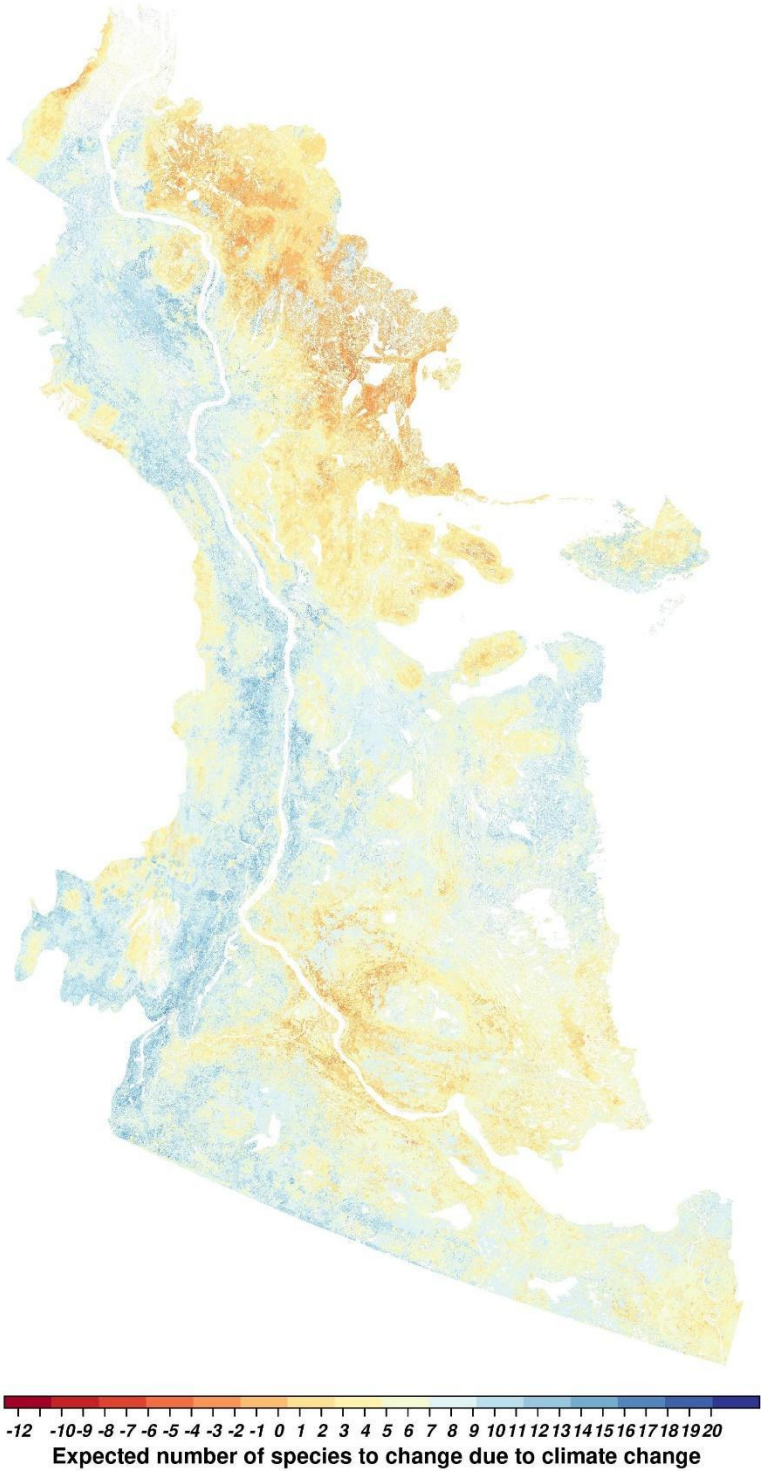

***Figure 3**: Areas where the number of landbird species will potentially increase (blue) or decrease (red) by the end of the century in response to climate change (Frontiers | Assessing Pathways of Climate Change Effects in SpaDES: An Application to Boreal Landbirds of Northwest Territories Canada (frontiersin.org)). This is an example of how data from the winter/ice roads monitoring program and other monitoring programs contribute to better understanding current and future potential status of landbirds in the NWT and across North America (see also State of the Birds 2022 and Home - Wild Species: The General Status of Species in Canada).*

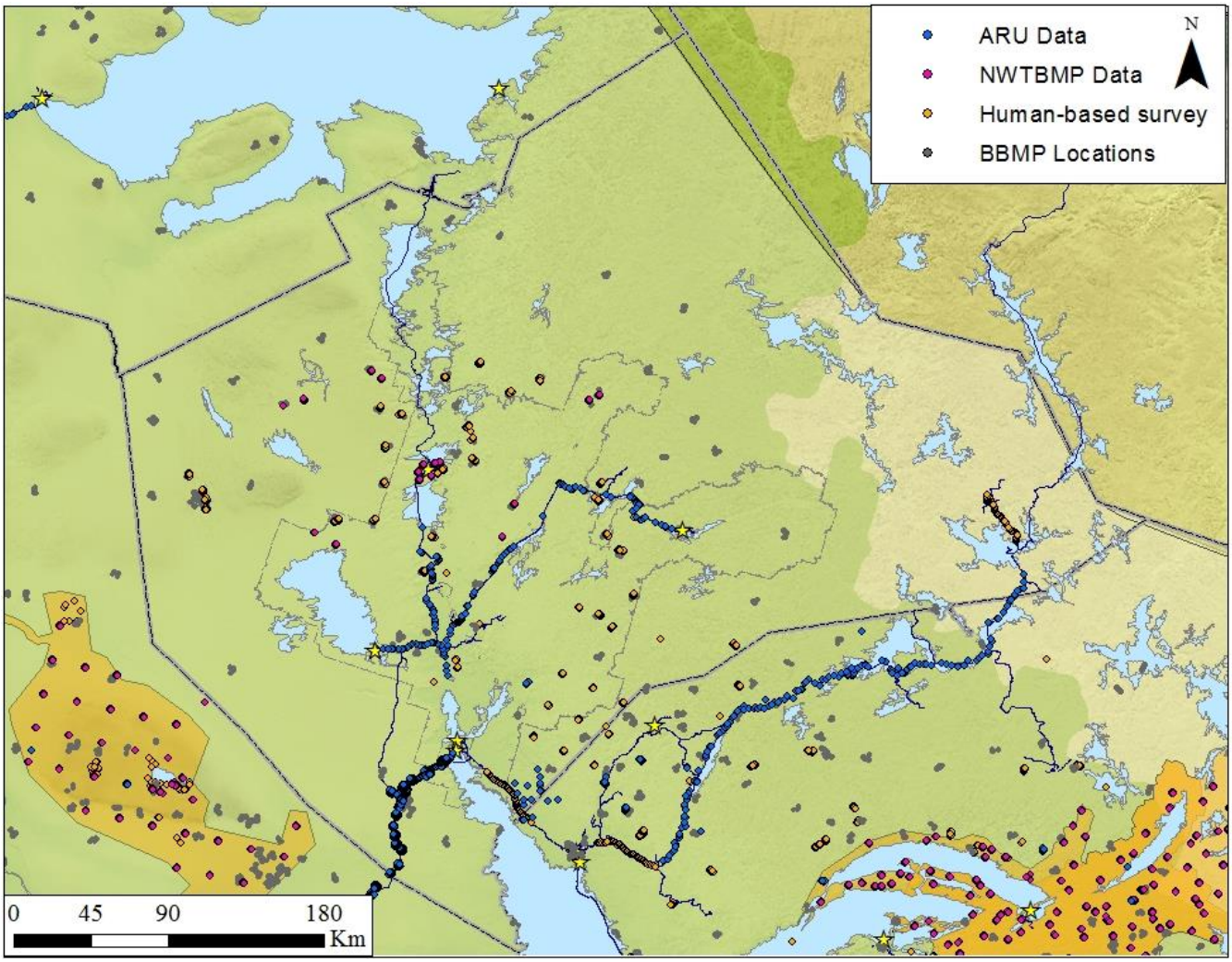

Figure 4: All locations along the winter road in the Tłı̨chǫ region where: 1) the NWT Biodiversity Monitoring Program has been successfully implemented (deployment of both ARUs and wildlife cameras; **purple**); 2) only ARU were deployed (**blue**); 3) human-based avian point count data has been collected (**orange**); and 4) priority unsurveyed locations in the region (**grey**).

Appendix 1. Proposed *recording schedule for each ARU to be deployed in 2024 along the Tłı̨chǫ winter road*.

April 1st – April 30th
- 1 hour before sunset: 10 mins
- @ sunset: 10mins
- 3 hours after sunset: 10mins
- 1 hour before sunrise: 10mins
- @ sunrise: 10mins

May 1st - June 30th
- 1 hour before sunset to 4 hours after sunrise: 10 minutes/hour

July 1st – August 15th
- 1 hour before sunset: 10mins
- @ sunset: 10m
- 2 hours after sunset: 10mins
- 1 hour before sunrise: 10mins
- @ sunrise: 10m

August 15th –September 30th
- 1 hour before sunset: 10mins
- @ sunset: 10mins
- @Midnight: 10mins
- 1 hour before sunrise: 10mins
- @ sunrise: 10mins

Appendix 2. Proposed *recording schedule for each bat ARU to be deployed in 2024 along the Tłı̨chǫ winter road.*

Bat Minis: May 1st - October 31st
-30 minutes before sunset to 30 minutes after sunrise

SM4 Bats: May 31st - October 31st
-15 minutes before sunset to 15 minutes after sunrise

Appendix 3. Proposed *recording schedule for each camera and temperature logger to be deployed in 2024 along the Tłı̨chǫ winter road.*

Sensor Type	Schedule
Camera	Continuous for motion triggers and timelapse photo daily at noon
Temperature logger	Records temperature every 3 hours