



NSMA Winter Road Monitoring Interim report 2024

Cumulative Impacts Monitoring Program Year 1 of 3

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Acknowledgements

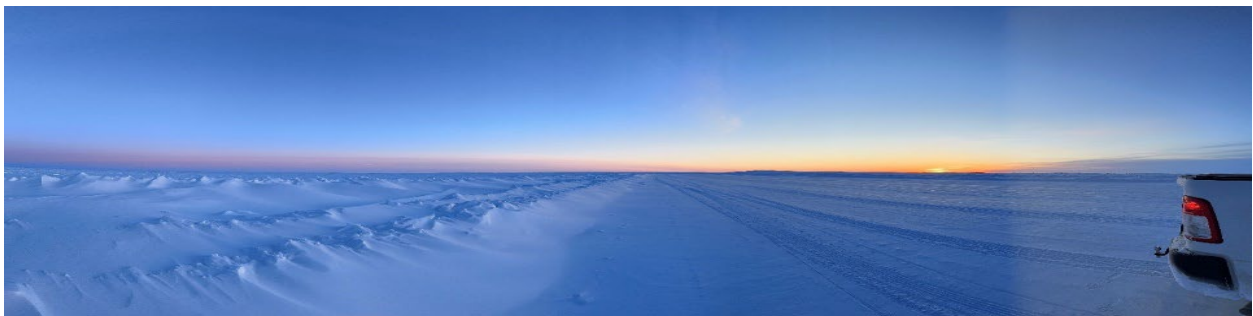
First and foremost, we would like to extend our heartfelt thanks to our winter road coordinator, Wayne Mercredi. As an NSMA guardian since 2020, Wayne has been instrumental in the success of this program. Over the years, he has conducted countless patrols along the ice road and has played a key role in the program's growth. Wayne's passion and respect for caribou are truly inspiring, and we are grateful for the invaluable knowledge he has shared with us. This program could not have succeeded without his guidance.

We also wish to thank all guardians who completed winter road patrols this year including Dylan Coumont, Maria McCormick, Darryl Bohnet, Shirley Coumont and Darren Johnston. We thank staff members Noah Johnson, Joseph Gionet, Orna Phelan and Ophélie Couriot from the Fate of the Caribou team for joining on patrols. The data you have collected and the relationships you have built on the ice-road are so important and we thank you for doing this work and braving life in the tundra.

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Introduction

The North Slave Métis Alliance and Caribou

The North Slave Métis Alliance (NSMA) is an Indigenous Government Organization representing the Métis people of the Great Slave region in the Northwest Territories (NWT), who possess Aboriginal rights protected under Section 35 of The Constitution Act, 1982. Our mandate is twofold: 1) the assertion, protection, and implementation of the Aboriginal rights of Métis people, and 2) the exercise of Métis responsibility to protect the environment while promoting and enhancing Métis education, economic, social, political, and cultural development.

Caribou hold significant cultural importance for the Métis of the North Slave region. Traditionally, community members have harvested caribou, which has been a staple food for many Métis families. Beyond consumption, caribou meat is used to make pemmican—a blend of tallow, dried meat, and berries. Additionally, caribou hide has been used traditionally to craft clothing, such as parkas. Caribou have always been central to Métis culture and community. Community hunts serve as a vital opportunity for experienced harvesters to pass on their skills and knowledge to the next generation, while also providing meat for all community members. While many North Slave Métis Alliance (NSMA) members also harvest other species such as moose, muskox, birds, rabbits, and squirrels, caribou has historically been the most important species.

The NSMA represents a community that is deeply connected to the land, and the caribou have been a critical part of this relationship for generations. The health and abundance of caribou directly impact the well-being of the Métis people. With this in mind, the NSMA has taken proactive steps to monitor and protect this keystone species. In response to the growing concerns over declining caribou populations in the North Slave region, the NSMA has established a Guardianship program focused on caribou monitoring. This initiative ensures that the Métis community is at the forefront of conservation efforts while fostering a deeper understanding of the health of caribou herds, their migration patterns, and the broader environmental factors influencing their population.

The Decline of Caribou in NWT

Many North Slave Métis members speak to the interconnectedness between people and caribou and the importance of caribou to Métis tradition and culture. However, in recent years there has been a dramatic decline in caribou numbers in the Northwest Territories. The Bathurst herd, named for their traditional calving grounds in Bathurst Inlet Nunavut, has suffered a decline of almost 98% from 470,000 animals in the 1980's to 6,240 animals in 2021 (Adamczewski et al., 2022). The most recent

estimates of the Bathurst herd put their numbers at approximately 6,851 animals (Adamczewski et al., 2022 unpublished). Historically, the Bathurst herd ranged from southern and central NWT to Bathurst Inlet in Nunavut, and they were known to winter as far south as northern Saskatchewan (Government of the Northwest Territories, 2019).

However, in recent years (2009-2021) the herd's range has contracted significantly. In 2018, barren-ground caribou were listed as *threatened* by the NWT Conference of Management Authorities (CMA) (NWT Conference of Management Authorities, 2018). This means that barren-ground caribou is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.

Many NSMA members remember a time when the Bathurst herd moved in huge numbers and traveled as far south as Prelude lake (Lawrence Mercredi affidavit). Beyond being a crucial food source, caribou hold significant spiritual importance for many Métis people, who deeply respect them. The unprecedented decline of this culturally vital herd has spurred NSMA members to take action. In response, the Guardianship Winter Road Monitoring program was established, reflecting the NSMA members' commitment to safeguarding their traditional territory.

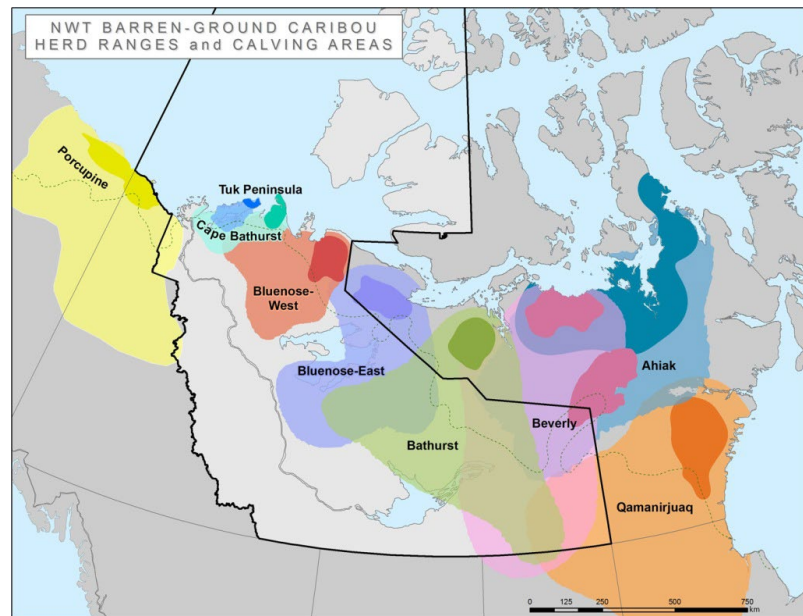


Figure 1: Annual ranges and calving grounds of the Bluenose-West, Bluenose-East, Bathurst, and Beverly herds (Adamczewski et al., 2020)

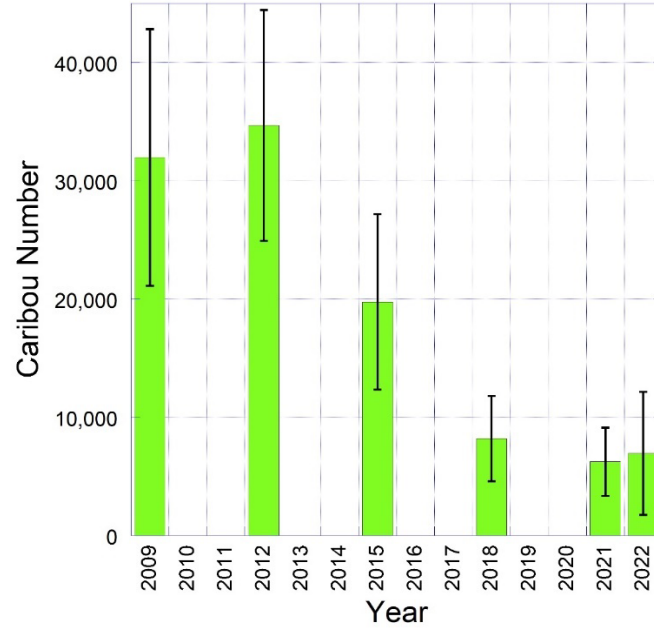


Figure 2: Bathurst herd calving population estimate 2009-2022. (Adamczewski et al. 2022 unpublished)

Previous Years of Winter Road Monitoring

NSMA’s Guardianship programme was developed in 2020 and included caribou monitoring on the Tibbitt to Contwoyto Winter Road. Members would carry out vehicle transects and count caribou and other wildlife along the road. However, due to budget and logistical constraints, the total number of monitoring days were quite low (11 days in 2021, 9 days in 2022, 10 days in 2023). Members would track GPS locations of any wildlife seen along the road and note information such as health of the animal, sex, approximate age and groups size as well as environmental conditions and human activity.

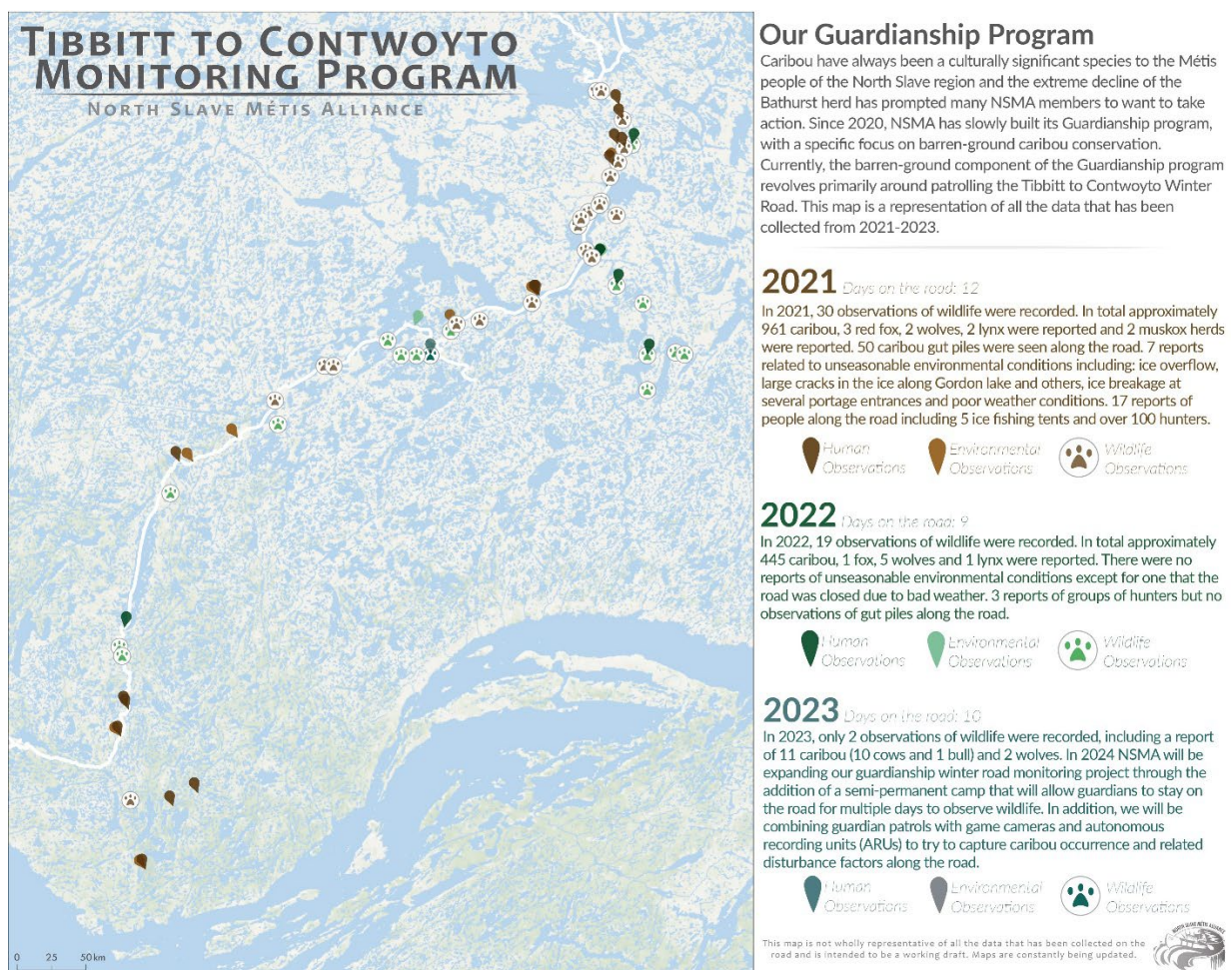


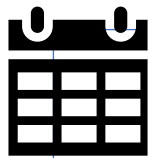
Figure 4. Previous years of caribou monitoring on the Tibbitt to Contwoyto winter road by NSMA members (Jess Smart, NSMA)



Photo 1. Bathurst caribou, photo Mercredi and Bradbury (2021), **Photo 2.** Tibbit to Contwoyto winter road, photo Mercredi and Bradbury (2021), **Photo 3.** Fox, photo Mercredi and Bradbury (2021), **Photo 4.** Bathurst caribou, Victor and Rita Mercredi (2022), **Photo 5.** Bathurst caribou, Mercredi and Bradbury (2022), **Photo 6.** Arctic wolves, Mercredi and Bradbury (2022)

Goals and objectives for NSMA's Guardianship Winter Road Monitoring

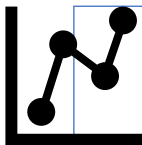
Guardians are the eyes and ears for their traditional territory. Thanks to funding from NWT Cumulative Impact Monitoring Program (NWT CIMP), between 2024-2026, NSMA's goal is to further develop and expand our winter road monitoring program. We aim to quantify spatial and temporal relationships between caribou occurrence and mortality (e.g., gut piles) with caribou disturbance factors (vehicles, predators, noise disturbance) along the length of the Tibbit to Contwoyto winter road throughout the winter road season (Feb-Mar annually). New data collected in the field (Guardian observations, audio recorders, wildlife cameras) will be compared with member's traditional and local knowledge. In workshops with members, we will validate field data, note where changes in caribou occurrence and disturbance/mortality factors are suspected from historical conditions, and examine how caribou-people relationships have changed with the road. In addition to collecting data, NSMA members will report instances of poaching within the no-hunting zone to wildlife officers.



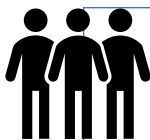
Establish a consistent schedule of guardians monitoring the winter road each year with help of a newly hired Winter Road Coordinator



Traditional Knowledge Input: Provide more local and traditional knowledge of barren-ground caribou to decision-makers and become an active contributor to caribou conservation through traditional knowledge documentation



Western Science Practices: Develop NSMA's data analysis procedures for wildlife observations, photos, and audio data through partnerships with government and academics



Build capacity within the NSMA to play an active role in the study of cumulative impacts and the management of barren-ground caribou by strengthening the existing guardianship program

Methods

Community consultation and input

The development and expansion of the Guardianship-led caribou monitoring program has been greatly influenced by the input and guidance of NSMA members. In June 2023, after securing funding from the Caribou Impact Monitoring Program (CIMP), the NSMA held a presentation to inform interested community members about the new funding and the objectives of the project. Since then, three engagement sessions have been conducted with NSMA community members to ensure their ongoing involvement and feedback.

In October 2023, an internal meeting was held to present the study design and program ideas to NSMA guardians who had previously participated in the program. This meeting proved invaluable, as it provided crucial advice on logistics, such as where to set up camp, how to run patrols, and the necessary equipment and training for guardians to effectively participate.

Building on this, in November 2023, the NSMA collaborated with the Fate of the Caribou team from State University of New York to hold two workshops aimed at exploring the historic relationships community members—primarily elders and experienced harvesters—have had with caribou. The workshops focused on how these relationships have evolved, particularly with the decline of the Bathurst caribou herd. During the workshops, we documented key concerns, hypotheses regarding the causes of the decline, and perceptions about what must be done to protect caribou. The Fate of the Caribou team compiled the findings into a report titled Collaborative Research on Barren-ground Caribou.

In February 2024, a Guardian training workshop was held for all participants of the NSMA Winter Road monitoring program. This workshop aimed to equip guardians with the essential skills needed for effective monitoring. Topics covered during the training included:

- Use of devices such as InReach, satellite phones, and radios
- Check-in procedures to ensure guardian safety and communication
- Completing caribou observation forms
- Identifying the sex of caribou and evaluating their body condition
- Setting up camp upon arrival at designated monitoring sites

These collaborative efforts and hands-on training have been crucial in developing the program's foundation and ensuring its success in monitoring caribou populations.

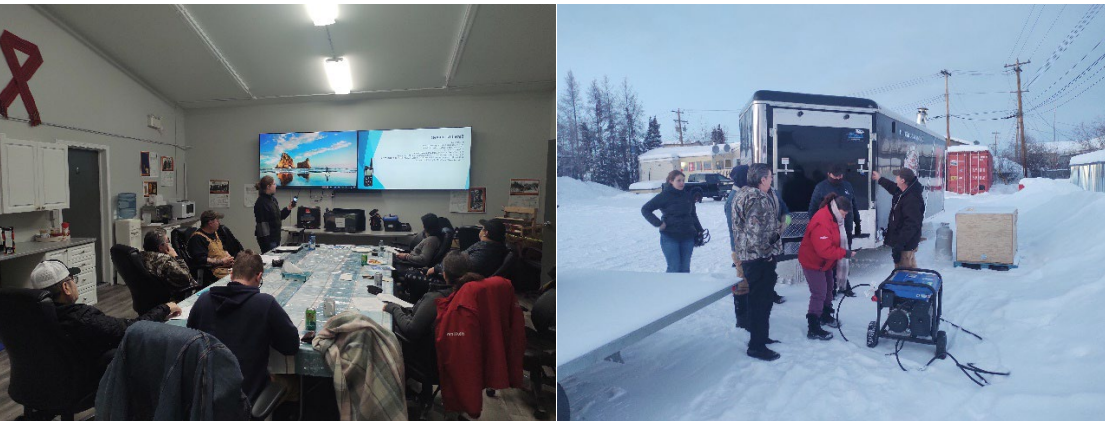


Photo 7. NSMA trailer with truck, **Photo 8.** NSMA mock camp set up, **Photo 9.** Guardian training workshop at NSMA office, **Photo 10.** Lead guardian, Wayne Mercredi, training participants

Study area:

Through community engagement sessions, a few areas were highlighted as priority monitoring spots, including Lockhart lake, Gahcho Kué mine spur road and Lac de Gras. Our camp was placed on portage 1 on the Gahcho Kué mine spur road.

Passive monitoring:

Passive sensory equipment such as game cameras and autonomous recording devices (or ARUs) are a cost-effective way to collect data when observers are not around. They have an added benefit of being able to detect wildlife activity that would otherwise be scared away by humans.

ARUs are self-contained audio recording devices that can be deployed in terrestrial environments for bioacoustics monitoring. We deployed 9 ARUs to investigate the sounds that caribou encounter in their environment and to measure how present human-made sound disturbance is along the winter road. ARUs were programmed to record 30 minutes of every hour 24 hours a day.

Game cameras work through the use of an infrared sensor that detects animals using temperature and is activated by motion when an animal passes in front of the detection zone. 9 Reconyx HyperFire 2 Professional Covert IR Camera were deployed along with the ARUs.

Guardian monitoring:

In addition to passive monitoring techniques, it was important to have guardians on the ground taking observations of caribou, disturbances and environmental conditions. Many of our guardians have been avid land users and hunters all their lives and have seen the decline of the Bathurst herd in real time. They can provide historic context to what we see in terms of caribou numbers today. Guardians performed vehicle transects and took georeferenced observations of the following: caribou occurrences and mortalities, caribou predators (such as wolves) and hunting/ other human activities. They also took note of animal activity (i.e., whether caribou were feeding, laying down, running) and body condition. Many members expressed an interest in investigating environmental conditions such as snow and ice formation and so we had members record snow depths and qualitative metrics whenever they stopped to take an observation. All data recorded was summarized into an excel spreadsheet for analysis. Figure. shows this data.



Photo 11. NSMA staff member Orna Phelan setting up camera and ARU on the GK spur road, **Photo 12.** NSMA camp set up, **Photo 13.** Tibbitt to Contwoyto winter road, **Photo 14,** staff member Noah Johnson in front of NSMA camp, **Photo 15.** Bathurst caribou next to ice road, **Photo 16.** NSMA staff member Orna Phelan photographing caribou head beside ice road

Pre- Season Information Gathering Workshops

What are NSMA Members Biggest Concerns about Barren-ground Caribou?

Before the ice road season, members described their biggest concerns about Barren-ground caribou in an information gathering workshop. The ice road to the mines was a widely shared concern among participants. Members expressed that they thought the roads created easy access right into the heart of the Bathurst herd, a previously remote environment.

“A lot has to do with the roads going up to the mines and the mines themselves. It is easy to get up there. Years ago, you had to go from Yellowknife to the hunting sites with snow machines. While now, all you have to do is drive there.”

In addition, members shared concerns that the road can be a physical obstacle to caribou movement and restrict migration routes. NSMA members worry that noise pollution created by traffic and construction of the road might also be forcing caribou to change their habitat use in order to avoid the road. Other concerns members had included overharvesting and disrespectful harvesting,

“There were wounded caribou all over the place, there were badly shot caribou, there were caribou that were dead, partly frozen, even from before. [...] It’s just bad, irresponsible hunting behavior.”

NSMA members have also noticed that climate change is having huge impacts in the North with spring coming earlier, fall coming later, winters becoming warmer, summers becoming drier and hotter and water levels decreasing. Members worry about invasive species moving further North and that there will be an increase in parasites and diseases affecting caribou.

“I remember winters when I was a kid, early 2000, we had a whole month of -40 [°C], now we are lucky if have a day here and there.”

Habitat loss and habitat encroachment was a concern held by many participants. Members feel that human development may have forced caribou to alter their range and their migration routes.

“The caribou are hurting so bad that they do not come down anymore.”

Please note that this section is a summary of some of the issues that were discussed in joint workshops and individual discussions held between the NSMA and the Fate of the Caribou research team from State University New York. For a fuller report please see “Report of the discussions between the North Slave Métis Alliance (NSMA) and Fate of the Caribou (FotC), November 09, 13, 14 and December 08, 2023 by Ophélie Couriot.

Results - 2024 Winter Road Season

| Number of cumulative days of monitoring | Number of observation forms completed | Number of km driven | Number of caribou seen |
|---|---------------------------------------|---------------------|------------------------|
| 27 | 45 | 6,934km | >4,500 |

For the pilot year of our project, Guardians and staff completed 27 cumulative days of monitoring on the ice road which involved driving almost 7,000 km. Guardians completed 45 observation forms that reported the number of caribou they saw, animal health, animal activity, weather conditions and disturbance levels. These Guardian patrols were essential to complement the data collecting using ARUs and cameras as Guardians were able to speak to historic conditions and provide extra contextual information.



Photo 17. NSMA member Kyle Coumont on caribou monitoring patrol

Caribou Group Size, Body Condition and Health

Is difficult to estimate exactly how many individual caribou were reported on because Guardians may have counted the same animals or groups of animals multiple times. Caribou were seen in groups ranging from 3-4 to over 1,000 animals. Caribou were described as looking “healthy” by Guardians. Most were described as normal to fat in terms of body condition. However, Guardians were often quite far from the animals they were observing as they had to stay close to the truck and caribou were often far in the distance on hills and so reporting accurately on the ratio of bulls: cows: calves as well as body condition was a challenge.

“Lots of big ones grazing, no predators. Wow! This is the most caribou I've seen in a very long time. Awe-inspiring! I'm so happy to be seeing this”

Reports also suggested that lots of yearlings were present which is a good indication that many of the calves born last year survived the winter. One guardian who has been monitoring the road for the last five years said in the past he had seen groups of 30, 40 or 50 caribou but this year he saw thousands. He was “awestruck” and said he just sat and watched them, it made him really happy and he described the experience as “really special”.



Photo 18. Barren-ground caribou on the Tibbit to Contwoyto winter road 2024

Caribou winter habitat

Many of the caribou seen on the ice road were migrating North towards their calving grounds (Bathurst Inlet or east of Bluenose Lake depending on herd) during February and March.

“Heard heading north, maybe going to calving grounds. Some bulls have huge antlers. I'm grateful for the no hunting zone to protect them. They're walking in single file and look towards trucks as they pass”.

In workshops, many NSMA members expressed that they were worried about caribou being able to reach their forage this year due to many “rain on ice” events. Members were curious if ice layers had formed in the snow that would impact caribou access to important forage. While on the ice road guardians were asked to describe the snow and comment on caribou feeding behavior. In some areas the snow was “soft and powdery on top” while in other areas snow was “hard packed and wind swept”. However, several guardians reported that caribou were using their hooves to dig for forage and were “eating happily”.

“(Caribou are) feeding, laying down, standing. Caribou are pawing at ground to get to food”

Some guardians also dug holes to look at snow layers and reported no ice layers. Unfortunately, guardians did report instances of garbage dumped along the road.



Photo 19. Garbage left behind on McKay Lake

Disturbances to caribou

NSMA Guardians reported on a range of disturbances that caribou face while on the ice road, both during Guardian patrols and during workshops and discussion group meetings. The main sources of disturbance reported were heavy traffic along the road and hunters. In terms of predators to caribou, guardians didn't see any wolves during patrols but there were many reports of wolf tracks.



Photo 20. Wolf tracks close to the ice road

Wastage

Guardians were disheartened to see so much wastage along the road. In the NWT, it is an offence to waste, destroy, abandon or allow to spoil the following edible parts: backstraps, hindquarters above the knee, front quarters above the knee, tenderloins, rib meat and neck meat. Beyond that however, it goes against the Métis way and Indigenous traditional values to disrespect caribou and the land by wasting meat. “Take only what you need” is the foundation of all respectful harvesting.

12 observations of gut piles were made, and guardians estimate each gut pile represented up to 25 caribou. Although not all gut piles included wastage, guardians did report that in some instances only the backstrap and quarters were taken, with all the rest of the animal left.

“Saw carcasses near ice road, only quarts and back strap taken. Left heads and most of carcasses. Lots of wastage. What a tragedy. I was happy to see caribou moving and that mobile zone moved to protect them”

“Large gut pile with hooves, antlers, full heads left behind. I don't think this is a large waste, I do feel they should have taken some hide”



Photo 21. Caribou carcasses on the ice road representing disrespectful harvesting. **Photo 22.** Large gut pile of caribou on McKay Lake

Human Harassment

In early March, guardians reported an instance of driver misconduct by a Joint Venture vehicle while caribou were trying to cross the road north of MacKay Lake. A JV driver failed to maintain the mandated 300m and got too close to the caribou, stopping their movement across the road. The Guardians reported the incident to ECC wildlife officers and NSMA wrote a follow-up letter of complaint after the incident to the Tibbit to Contwoyto Winter Road Joint Management Committee.

“(JV vehicle) at 3pm stopped migration across road. Came too close to caribou. Now they're just standing around. Caribou no longer crossing the road”



Photo 23, 24. Caribou crossing the road on McKay Lake

What effect do these disturbances have on caribou?

In addition to reporting on disturbances to caribou, we also asked guardians to try to perceive how these disturbances were affecting the caribou. This is a difficult question to answer purely from observations, but we did gather some interesting information. We asked guardians to note what caribou were doing when they were observing them (walking, lying down, feeding etc.). Activity budgets can be a useful technique to determine how much time an animal spends on various activities such as eating, resting, sleeping and moving. Studies have shown that caribou in disturbed areas spend more time walking and running and less time feeding and laying down (Murphy & Curatolo, 1987). Most guardians indicated that there was a range of activity observed within one group of animals with some animals feeding, some laying down and some walking. Only four reported instances of caribou running. One category that we didn't include in this year's observation reports was "vigilance". Animals who display vigilance, that is, are alert and looking around, may spend less time feeding and expend extra energy compared to resting (Bøving & Post, 1997). Therefore, perhaps if we included "vigilant" as a category we might find that caribou around the winter road display more vigilant behavior than other caribou.



Photo 25. Caribou lying down, walking, standing close to the ice road

Most observations of caribou noted that they were on the west side of the road. However, caribou were seen physically crossing the road when there were low levels of traffic. The general impression from guardians is that the level of traffic, rather than the road itself, is what influences caribou movement. This year, due to a warmer winter than usual, there were major delays in the opening of the ice road, and this meant that mines were under more pressure to get all supplies hauled in a shorter period. Therefore, the time intervals between vehicles may have been significantly shorter than in previous years, leading to an overall greater level of traffic between mid-February- end of March.

Conclusion and next steps

Overall, NSMA's Winter Road Guardian Monitoring Program was a huge success in 2024. We were successful in placing a semi-permanent camp on the Tibbit to Contwoyto ice road and completing 27 days of Guardian-led monitoring. In addition, we provided valuable training and on-the-land opportunities to several NSMA members. Many expressed their gratitude for the experience, sharing that observing barren-ground caribou in their natural habitat was deeply moving and sparked a stronger desire to protect these remarkable animals.

We are currently working with Megan Perra from the Fate of the Caribou team and New York State University to analyze our soundscape data, with the goal of creating a predictive model of traffic density and level of disturbance on the ice road. Eventually we hope to incorporate this data with caribou collar data collected by GNWT to try to investigate whether the ice road is impacting caribou movement. To build on this progress, we plan to deploy additional cameras and ARUs during the 2025 ice road season to gather even more comprehensive data.

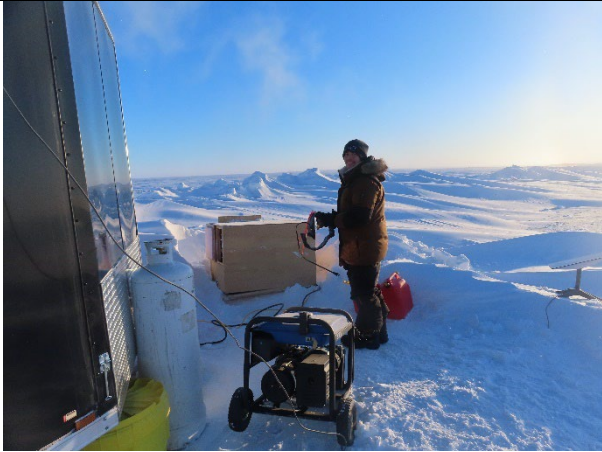
Indigenous-led guardianship programs are increasingly recognized as vital tools for preserving biodiversity and protecting ecosystems. Rooted in the traditional knowledge, practices, and worldviews of Indigenous peoples, these programs leverage the deep connection community members have with their land and species. This on-the-ground monitoring is invaluable in tracking wildlife and environmental changes, particularly in northern ecosystems. Through this ongoing work, the NSMA aims to contribute essential data to help protect and conserve one of the North's most precious resources—barren-ground caribou—for generations to come.

Appendix

Appendix A: Caribou

| | |
|---|--|
|  |  |
| Caribou digging for food | Close up of caribou in winter road |
|  |  |
| Caribou foraging, laying down | Caribou foraging |
|  |  |
| Caribou on eskers | Huge group of caribou in the distance |

Appendix B: Pictures from the field



Staff member Noah Jonson refilling generator fuel



NSMA winter road camp set up



NSMA member Kyle Coumont investigating ice layers in snow



Ophélie Couriot monitoring caribou in the distance



NSMA member Shirley Coumont at camp



NSMA member Kyle Coumont on patrol



Red fox foraging for food



Ice road



Beautiful evening in the tundra



Dylan Coumont and Maria McCormick on the ice road



Wayne Mercredi cooking a meal at camp



Joseph Gionet counting caribou from vehicle

Appendix C: Camera/ ARU set up



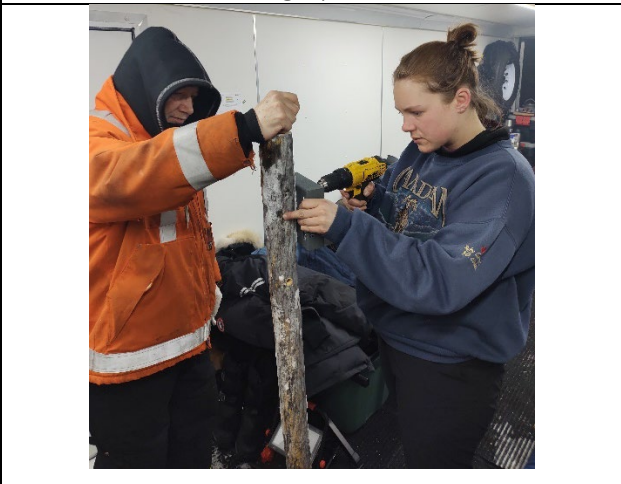
Orna Phelan setting up ARUs and cameras



Orna Phelan setting up ARUs and cameras



Noah Johnson in the Mobile Core Bathurst Caribou Management Zone



Orna Phelan and Wayne Mercredi building ARU and camera stands



ARU and camera unit recording traffic



Noah Johnson with skidoos and sleds to place ARUs and cameras

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