



NWT Environmental

Research Bulletin (NERB)



NWT Cumulative Impact Monitoring Program (NWT CIMP)

A source of environmental monitoring and research in the NWT. The program coordinates, conducts and funds the collection, analysis and reporting of information related to environmental conditions in the NWT.

NWT Environmental Research Bulletin (NERB)

A series of brief plain language summaries of various environmental research findings in the Northwest Territories. If you're conducting environmental research in the NWT, consider sharing your information with northern residents in a bulletin. These research summaries are also of use to northern resource decision-makers.

Why did the caribou cross the road? Barren-ground caribou and an industrial winter road

The Tibbitt to Contwoyto winter road is the primary supply route for diamond mines in the central Northwest Territories. The road and associated mines overlap the winter ranges of several barren-ground caribou herds. We investigated how the winter road influenced the behaviour, stress levels, and road crossing events of caribou. Our results show that caribou change their behaviour near the winter road, spending less time feeding and more time walking. We also found that very few caribou crossed the road when normal levels of industrial traffic were occurring.

Why is this research important?

Given that barren-ground caribou herds are in decline across the Northwest Territories, wildlife managers with Territorial and Indigenous governments want to know more about the potential effects of human disturbance. Previous research has shown that caribou avoid or change their behaviour around industrial developments. However, little is known about the impact of winter roads and traffic on caribou behaviour.

What did we do?

We used a variety of methods to document the responses of caribou to the winter road during the winter. Those methods included watching the behaviour of caribou, measuring their stress levels from fecal pellets, and using GPS collars to follow their movements across the landscape.

What did we find?

We found that:

- Levels of stress hormones found in fecal pellets were highly variable and did not appear to be related to distance from the road.
- GPS collar data revealed that caribou rarely crossed the winter road when it was active, and were more likely to cross the road when there was no traffic.
- Caribou changed their behaviour depending on how near they were to the active winter road. The closer caribou were to the active road, the more time was spent walking and less time was spent feeding (Figure 1).

What does this mean?

Project findings suggest that winter road traffic affects caribou behaviour and movement, contributing to cumulative impacts across the winter range of barren-ground caribou. In particular, vehicle traffic impeded crossing of the winter road, and caribou foraged less when beside the road. This project helps inform the management of present and future roads in barren-ground caribou ranges.

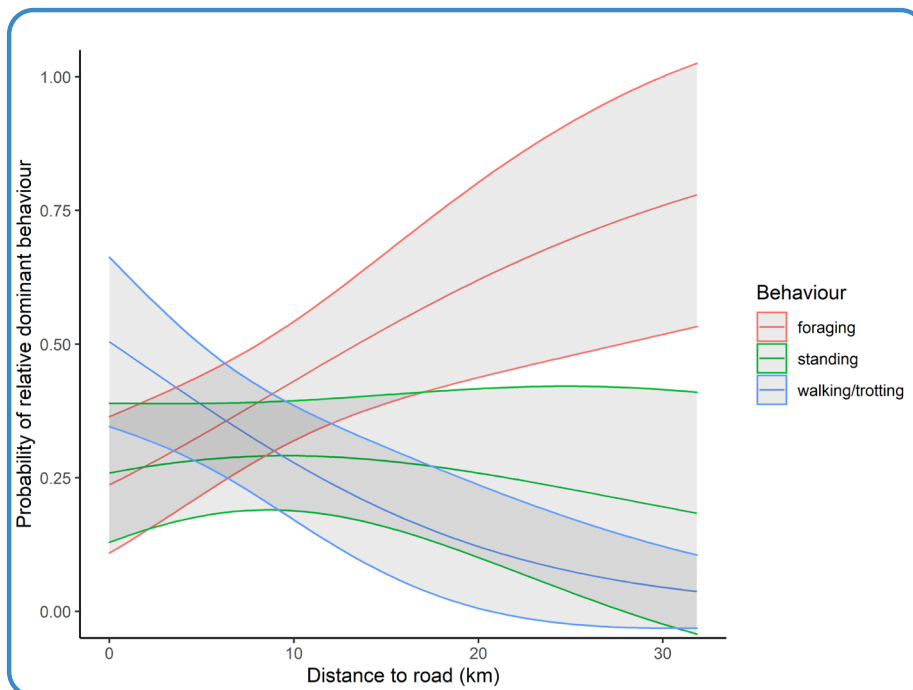


Figure 1 – Relative dominant behaviour of barren-ground caribou observed in relation to the distance to the Tibbitt to Contwoyto winter road (95% confidence intervals in shaded areas). (Adapted from: Johnson, C. and Smith, A. 2021. NWT CIMP Final Report 2020/2021: Assessing the disturbance response of barren-ground caribou to winter roads in the Northwest Territories (CIMP208).)



Fritz Griffith observing caribou.
(Credit: A. Smith)

Contacts

Angus Smith or Chris Johnson, University of Northern British Columbia
angus.r.h.smith@gmail.com
chris.johnson@unbc.ca

NWT Cumulative Impact Monitoring Program (CIMP208)
nwtcimp@gov.nt.ca

Recommended Reading

Plante, S., C. Dussault, J. H. Richard, and S. D. Côté. **2018.** *Human disturbance effects and cumulative habitat loss in endangered migratory caribou.* Biological Conservation 224:129–143. www.caribou-ungava.ulaval.ca/fileadmin/documents/Articles_PDF/Plante_et_al._2018_Biol_Conserv.pdf