Government of
Northwest Territories

Research Bulletin

NWT Cumulative Impact Monitoring Program

Tracking the Future: How Human Actions Could Shape Boreal Caribou Populations in the NWT
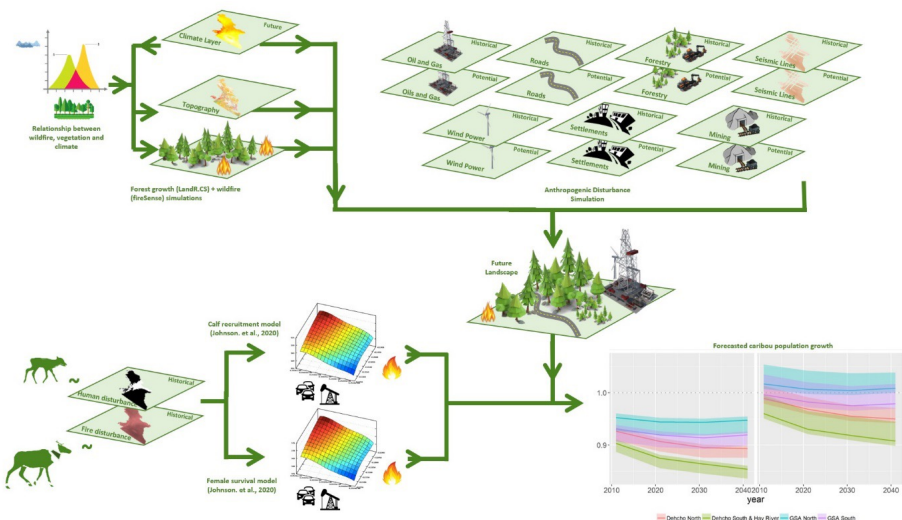
Summary

Human-caused disturbances, such as mining, roads and forestry affect boreal caribou habitats and populations. Our study used a computer-modelling tool (SpaDES) to develop a simulation model to forecast these disturbances and potential impacts to boreal caribou population growth. We found that with continued low levels of current human disturbance, the boreal caribou population growth or declines show only minor changes between now and 2041. This study highlights the value of integrated approaches and forecasting to assist in informed caribou range planning.

Inputs, outputs and relationship between landscape forecasting models and caribou population growth models.

Why is This Important?

Boreal caribou are an important part of the environment and are highly valued from a spiritual, cultural and harvesting perspective. Understanding how human activities impact ecosystems is crucial for effective management strategies and actions. The results of this project provide a tool for forecasting human disturbances in boreal forests, which is needed to manage and conserve boreal caribou.

What Did We Do?

To understand how disturbances impact boreal caribou populations, we used the SpaDES software platform to create and run models simulating various human disturbances based on data and forecasting of landscape changes. Multiple future scenarios related to boreal caribou populations were considered to inform decision-making. We looked at four areas that correspond with GNWT boreal caribou management zones: Gwich'in Settlement Area (GSA) North, GSA South, Dehcho North, and Dehcho South and Hay River.
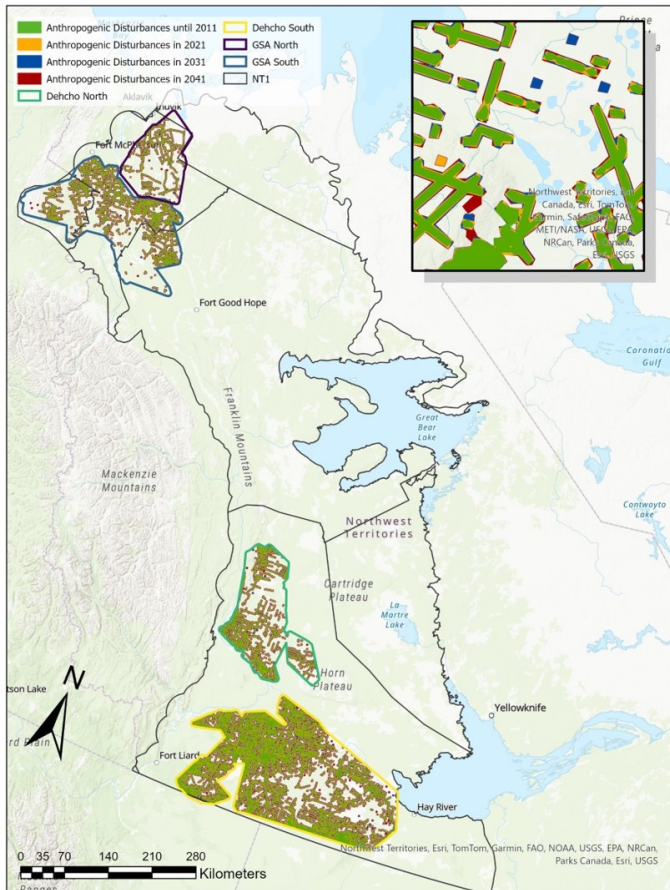
What Did We Find?

We found that:

- With continued low levels of current human disturbance (0.2% annual increase which reflects business-as-usual), boreal caribou populations show only minor changes between now and 2041.
- Boreal caribou in different areas show varying levels of susceptibility to disturbances and changes in habitat quality. Northern areas are less affected than southern ones.

Map of simulated disturbances generated within caribou herds in the NWT, per year from 2011-2041.

SpaDES (Spatial Discrete Event System)

A modeling tool used in ecological forecasting to integrate various components and forecast landscape changes to aid management strategies.

What Does This Mean?

- Maintaining a similar level of new human-caused disturbances, as well as restoring natural areas will likely help maintain boreal caribou populations in the region.
- Boreal caribou will benefit from localized management plans, as the human impacts vary across the landscape.

What's Next?

Our intended next steps include:

- Further developing disturbance generation models to forecast impacts more accurately on localized boreal caribou populations and habitat.
- Engaging with local communities and decision-makers to show results and discuss how they could be brought into management plans. This includes incorporating Indigenous and local knowledge where possible.

For More Information

NWT CIMP is a source of environmental monitoring and research. The program coordinates, conducts and funds the collection, analysis and reporting of information related to NWT environmental conditions. If you're conducting environmental monitoring and research, consider sharing your information with northern residents and decision-makers in a Bulletin.