

Research Bulletin

NWT Cumulative Impact Monitoring Program

Decision-support tools for understanding cumulative impacts on barren-ground caribou in the NWT

Summary

A better understanding of the future cumulative impacts on barren-ground caribou is necessary for appropriate and effective wildlife management in the NWT. We developed three decision-support tools in collaboration with Renewable Resources Boards (RRBs) and various Indigenous Governments and Indigenous Organizations (IGIOs). These tools simulate the cumulative impacts of climate change, project development, and management strategies on the habitat quality and population dynamics of the Cape Bathurst, Tuktoyaktuk Peninsula, Bluenose-West, Bluenose-East, and Bathurst herds of barren-ground caribou.

Why is This Important?

Northern decision-makers need evidence-based decision-support tools to assess and make informed recommendations on the cumulative impacts of land use, environmental changes, climate change, and management strategies on barren-ground caribou herd dynamics and their habitat.

What Did We Do?

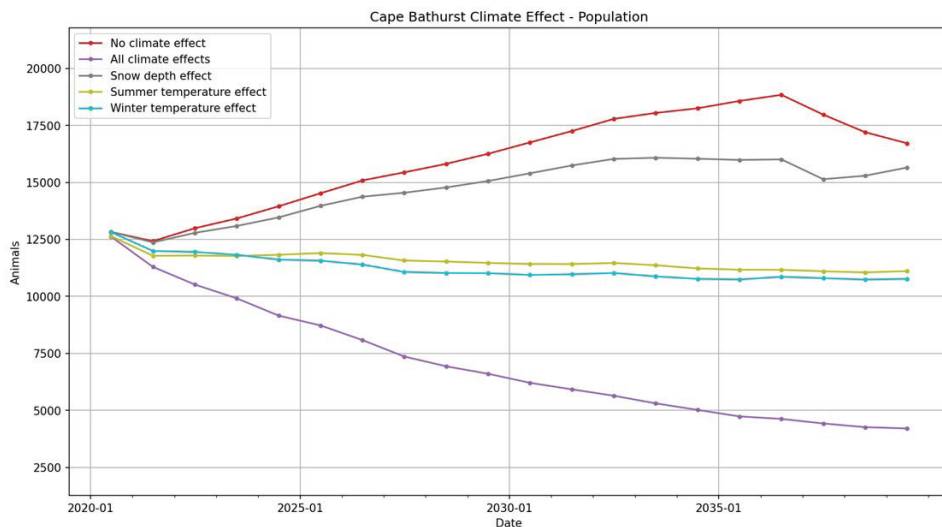
We developed three decision-support tools to simulate and assess cumulative impacts on barren-ground caribou:

- 1) *Landscape change simulation model* – This model simulates habitat and vegetation changes by forecasting changes in climate, wildfires, shrub expansion, and human land-use.
- 2) *Population dynamics simulation model* – These models simulate how populations for each herd may respond to changes in climate, vegetation, land-use, harvest levels, and vital rates, such as calf and adult female survival/mortality.
- 3) *Indigenous knowledge summaries* – Summaries of publicly-available Indigenous perspectives and observations on the trends and factors affecting barren-ground caribou populations, habitat, and health.



Bluenose-West caribou in Tuktoyaktuk National Park. (Credit: J. Frandsen)





Example of chart-based simulation output of the population response of the Cape Bathurst herd to climate effects.

What Did We Find?

- Landscape changes are expected to occur with future climate change and land-use development, which may impact caribou habitat availability.
- Changes in habitat availability were insufficient to cause simulated changes in barren-ground populations. However, populations were sensitive to changes in birth rates and calf survival associated with weight loss that could be caused by increased movement and decreased feeding in proximity to human development footprint.
- Caribou mortality is expected to increase in response to projected changes in temperature and snow depth, which threatens to cause substantial population decline.
- There's a high level of consistency in harvester observations from the Inuvialuit, Gwich'in, Sahtú, and Tłıchǫ regions on caribou population, habitat, and health.

What Does This Mean?

These tools are available to decision-makers at <https://cbgc.alces-flow.com/public/web/docs/>. The simulation models are informed by available evidence and are updated to comparatively assess the consequences of future land use, climate change, and management strategies to barren-ground caribou herds. The Indigenous knowledge summaries provide background ahead of engagement with knowledge holders in the process of collaborative scenario analyses of cumulative impacts to caribou and their habitat.

For More Information

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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.