



Impacts on Northern Wildlife

We know that climate change means temperatures are getting warmer and we can likely expect more precipitation. As a result of climate change, permafrost is melting and sea ice is getting thinner. Rivers and lakes are freezing later in the year, and melting earlier in the spring. These are a few ways that our northern world is starting to change as the climate changes.

So what will this mean for our wild friends like caribou, moose and even the pesky mosquitoes? What will happen as their home environment starts to change? This backgrounder describes how climate change might affect northern wildlife.

How Are the Caribou Dealing with Climate Change?

An Inuit legend about the origin of the caribou

Once upon a time there were no caribou on the earth. But then there was a man who wished for caribou, and he cut a great hole deep into the ground, and up through this hole came caribou, many caribou. The caribou came pouring out, till the earth was almost covered with them. And when the man thought there were caribou enough for mankind, he closed up the hole again. Thus the caribou came up on earth.

*Told by Kibkarjuk and recorded by Knud Rasmussen in
"1930 Observations on the Intellectual culture of the Caribou Eskimos."
Report of the Fifth Thule Expedition, 1921–1924, vol. VII, no 2,
Copenhagen, Gyldendalske Boghandel.*



In all three of Canada's northern territories, there are large herds of barren ground caribou. These herds are sometimes made up of 100,000 to 300,000 caribou!

Caribou herds travel great distances, season to season, from their wintering grounds to their calving grounds, and back again. Caribou travel to different areas because different places provide particular conditions that allow them to survive the season. If climate change affects the travelling conditions, it will affect the caribou.



For example, the calving grounds for the Porcupine Caribou Herd are located on the Arctic plain in northern Alaska. The Gwich'in people who are strongly connected to the Porcupine Herd believe the calving area in northern Alaska is sacred ground. Like clockwork, the Porcupine Caribou herd heads to this area in Alaska every spring from their wintering grounds in north and central Yukon, eastern Alaska or northwestern NWT.

However, as climate change warms things up and possibly causes more snow to fall, the snow may become deeper and heavier than normal. Have you tried walking through deep, wet snow? It's much harder than walking through dry, fluffy snow, isn't it?

So when the snow gets heavy and wet, it might be too difficult for some of the caribou to get to the Arctic plain in the spring. Caribou that can't make it all the way to the Arctic plain will have their babies away from their traditional calving grounds. These cows and calves will not have all the benefits of their normal calving grounds – the nutrient rich food and safety from wolves and bears. So fewer newborn caribou will survive.





Other northern herds like the Beverly Caribou Herd also travel great distances every year, sometimes as far as 2,000 kilometres one-way. The Beverly herd spends time in northern Saskatchewan, NWT and Nunavut. The Qamanirjuaq Caribou Herd also travels far and wide, from Nunavut and NWT down into northern Saskatchewan and Manitoba. These caribou herds need to travel great distances to find the different types of summer and winter habitats that they need to survive. Travelling through heavy, wet snow would make these journeys much harder.

Earlier break-up and thinner ice

Travel for the caribou is also getting harder because warmer temperatures in the spring are causing rivers and lakes to break-up earlier.

Inuit Elders in the Bathurst Inlet area in Nunavut have reported how warmer weather in the 1990s affected the Bathurst Caribou Herd. (A research project called the “Tuktu and Nogak Project” collected Inuit observations on this herd). The elders believed that the Bathurst caribou shifted their migration routes to avoid rivers full of rushing water and chunks of ice. The elders also noted that more caribou were drowning as the caribou fell through ice that was thinner than usual.

Its not just the caribou whose travel plans are interrupted

In 2000–2001, Vuntut Gwitchin residents of Old Crow, Yukon reported that, “We had only about two cold spells before Christmas. Because of the snow depth, it left the lakes and river with a lot of overflow, open water and hard to travel. There were a lot of problems with wet snow.”

*Arctic Borderland Ecological Knowledge Co-op,
Report Series Number 2001–2.*



Digging for food

The heavier and deeper snow that is expected to result from climate change may also make it harder for the caribou to dig through to get to their food (mostly lichen) that is buried under the snow. Another problem is that as temperatures warm with climate change, there will likely be more cycles of thawing and freezing of snow during the winter. This will create ice that the caribou will have to dig – and walk – through.



Depending on the snow conditions, caribou may have to spend more time digging for food than actually eating it. What do you think might happen to the caribou if they have to spend so much energy travelling and digging in the snow?

More bugs to avoid

As climate change causes temperatures to increase, mosquitoes and parasites will be able to survive farther north and higher up the mountains – in places where it used to be too cold for them to live. Caribou hate mosquitoes and will go out of their way to seek windy areas because the wind keeps the mosquitoes away. If there are more of these little pests around, the caribou will likely spend even more energy trying to get away from them. If the caribou spend more time avoiding mosquitoes, and less time eating, their health will be affected.

Some good news! Plants grow sooner

Climate change may also have some benefits for the caribou. People have noticed that the snow is melting earlier in the spring than it used to. This means that vegetation can start growing earlier in the year.

Elders in Nunavut have noticed that the Bathurst caribou have changed their migration in order to move to areas that are greener and lush earlier in the year.

Scientists in Alaska have looked at satellite images of the calving grounds of the Porcupine Caribou Herd that were taken between 1983 and 1996. These images clearly showed that things had started to get greener earlier in the spring as the years passed. Studies have shown that more calves are surviving in this herd and researchers believe it is likely because the nutrient-rich food is available earlier in the year. The new growth in the plants provides the energy the new caribou moms need to produce their milk.



Although more calves in the Porcupine Caribou Herd are surviving, more of the caribou cows are dying. Starting in 1989, the herd started to decrease in size. Since that same time, the weather has also been getting warmer. During this time period, the temperature has been above zero about twice as often as it used to be. This has made travelling conditions much harder for the caribou and it is likely why more cows are dying.



If caribou are affected, so are many communities

Communities in the range of all of these caribou herds depend on the migrating caribou for food. Caribou have been central to the culture and life of many northern aboriginal people for thousands of years.

If the caribou change their migration routes or decrease in numbers, this will have a serious impact on people in many northern communities. For example, caribou meat is a healthy – and inexpensive – source of food. If hunting caribou becomes too difficult, this will affect the health of northern people who currently eat a lot of caribou. It will also change a long tradition of how people live on the land.



Meandering Moose?

Moose usually live in the boreal forest, eating willows and other shrubs. Moose are not usually considered an “arctic” species because they prefer the cover of forests and brush to the open tundra.

However, lately, people are seeing moose more and more along the North Slope and Arctic coast in the northern Yukon. Moose have also been seen traveling out to the Beaufort Sea in the summer. This is not where you would expect to find moose!

Moose were counted in the Northern Richardson Mountains (along the border of the Yukon and NWT) and the nearby coastal plain in March 1989 and again in March 2000. Over this time period, moose numbers in this area increased by 67%!



There might be more moose in this area because their usual predators – wolves – continue to focus on eating caribou and the other animals that the wolves are used to. These northern wolves may not have added moose to their menu – yet! So, without anyone eating moose for dinner, the moose population can increase. That would change if local wolves added moose to their menu plans!

However, moose could also be increasing in numbers in part because of climate change. Elders in Aklavik, NWT have reported that there are more willows – which the moose eat – than there used to be on the Yukon’s North Slope. The increase in willows is partly caused by warmer temperatures caused by climate change. As the willows move north with warmer temperatures, the moose may also be following their food north.

Other Northward Bound Animals

Other animal species are also moving farther north, possibly because of the warming climate. In some areas of the Yukon and NWT, whitetail deer, coyotes and cougars are already being observed farther north than usual.

One reason these animals might be moving north is because the plants that some of them eat are also moving north as the weather gets warmer (*see Backgrounder 6*). And when the animals that eat the plants – the herbivores like moose and deer – move north, then the animals that eat the herbivores – predators such as cougars and coyotes – will also follow their food north!

Climate Change and the Little Critters

Did you ever wonder where all the small animals like ground squirrels and mice live in the winter? Many make their winter homes under a blanket of snow.

The small mammals can breathe under the snow because air can travel through dry and fluffy snow. But if the weather is warm and the snow becomes layered with ice, then the carbon dioxide that the animals breathe out (and the carbon dioxide the soil slowly releases) could start to suffocate these little creatures. If this happens the small mammals would have to travel to the top of the snow to get some fresh air. Above snow, the predators or freezing temperatures can get them.





But Arctic ground squirrels could also benefit if we get deeper snow – without the icy layers. Studies in the Yukon have shown that when the snow is deeper in the winter, ground squirrels successfully raise more babies.

This Should Bug You!

Insects that hang out in southern Canada will also start moving north as the weather warms. And the northern pests that already live here will likely be able to move further up the mountains and into more northerly (areas where it used to be too cold for them to survive). So warmer weather will mean a buggier north!

New parasites will also likely travel north. Some of these might travel in on the backs of other species that are heading north: animals like the whitetail deer. And species of parasites that already survive in the north can be expected to increase in number as the climate gets warmer. Parasites live off of many types of wildlife and can seriously affect the health of animals like caribou and moose. So getting more parasites could harm our wildlife.

Insects and parasites can also affect plants and trees. Around Kluane National Park in western Yukon, spruce bark beetles have killed large areas of mature white spruce forest. A number of mild winters and springs provided good breeding conditions for the beetles and allowed them to survive the winters and multiply rapidly. Over 200,000 hectares of forest were affected by these beetles between 1994 and 1999.

Traveling back to Whitehorse from Vancouver one year and I came upon a bull moose lying on the road.... It was full of bugs. Later I saw the moose walk around it had no hair on it. It was eaten up. Where do the bugs come from?... It isn't only the moose that has it, its caribou, sheep and lynx too.

Johnny Smith, Elder's Panel during climate change workshop at the Council of Yukon First Nations, February 2003.



So, Is It Good or Bad News?

As you can see, climate change will cause both some positive and some negative impacts. Moose might like having more food to munch on but might not be so keen about having more parasites to deal with. Caribou will have more trouble traveling in the snow, but earlier springs will mean good food arrives earlier too!

Northern people and other researchers are still trying to figure out exactly just what will change, how quickly the changes will occur, and how easily plants and animals will be able to adapt.

To understand how a changing climate is changing the land on which the wildlife discussed in this backgrounder rely, read Backgrounder 6. To read more about climate change impacts on other animals, like polar bears, seals, walruses and other ocean-based animals, check out Backgrounder 10. For information on fish and birds, see Backgrounder 9.



Key Points

- ★ Barren ground caribou in northern Canada travel great distances every year. However, travelling conditions for the caribou are becoming harder with climate change because the snow is getting deeper and heavier. Ice on lakes and rivers is also thinner and breaking up earlier in the year which is dangerous for the caribou.
- ★ Climate change also means there will be more insects to harass caribou. On the good side, plants that caribou eat are growing earlier in the spring.
- ★ Moose and other animals like coyotes, white-tailed deer and cougars are being seen farther north.
- ★ Smaller mammals may find it difficult to live under the snow if climate change makes the snow icier than usual.
- ★ Insects and parasites are expected to increase in numbers with warmer weather.



Want to Know More?

Here are some websites to help you find out more about the impacts of climate change on northern wildlife:

- **Being Caribou Homepage:** <http://www.beingcaribou.com/> – Two Canadians follow the Porcupine Caribou from Old Crow. Follow them on their journey.
- **Defenders of Wildlife:** <http://www.defenders.org/wildlife/arctic/oildevelopment.html> – Links oil development in the north with increased global warming, and increased problems for Arctic wildlife.
- **Greenpeace Archives:** <http://archive.greenpeace.org/climate/arctic99/reports/seaice3.html> – A comprehensive scientific article on what's happening to Arctic ice, and its effects on Arctic wildlife.
- **Greenpeace USA (Climate Chaos):** <http://www.greenpeaceusa.org/climate/speciestext.htm> – Good overview of the effects of climate change on wildlife. Click on the bottom links to read more about caribou and salmon.
- **Taiga Net: Caribou:** <http://www.taiga.net/top/caribou.html> – A page of great caribou links, including a slide show and a population model.
- **West Kitikmeot Slave Study:** http://www.wkss.nt.ca/HTML/08_ProjectsReports/08_index.htm – Click on the two Caribou topics to read about what traditional elders say about the caribou and changing habitat.