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Study: Climate change will put caribou genetic diversity at risk

Yereth Rosen | December 19, 2013

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Climate change will strain caribou herds around the circumpolar north in coming decades, but Alaska's herds should fare better than their Canadian counterparts, according to a [newly published study](#).

Genetic diversity, key to the animals' ability to withstand climate shifts and habitat loss, will take varying hits over the coming decades, says the study, which predicts the fate of genetic diversity of caribou herds through 2080. It was published online Sunday in the journal [Nature Climate Change](#).

The scientists, led by researchers at Quebec's Laval University, studied the genetic traits of nearly 1,300 caribou from around the circumpolar north, and made projections through 2080 based on genetic diversity within the herds.

In general, the more stable the climate, the wider the genetic diversity among caribou, the scientists found. If you are a caribou, "The farther north you are, the better off you are," said study co-author [Kris Hundertmark](#), an associate professor of wildlife ecology at the University of Alaska Fairbanks.

While habitat is expected to change for most Alaska caribou in coming decades, there will not be as drastic a transformation as what is expected for caribou farther south, Hundertmark said. Canada's woodland caribou, which live just north of the U.S. border and are facing rapid loss of habitat, will probably be the worst off of the world's caribou, he said.

As vegetation and habitat types shift north over time, so will the southern caribou herds, he said. But surviving herds will be

the descendants of only the northernmost of those southern caribou, he said. As suitable habitat moves north, "it's not as if all the caribou pick up and move with it," he said.

Remaining caribou populations will be more fragmented, more isolated and will have less genetic variety, he said.

In addition to habitat loss, a warming climate brings another problem -- wildfires. While good for moose habitat, wildfires are bad for caribou because they burn lichen that the animals eat in winter, Hundertmark said. "It takes those lichen beds at least 50 years to regrow," he said.

For Hundertmark and co-researcher [Karen Mager](#), a former UAF graduate student, the genetic work on Alaska caribou began in 2008. The international coordination began about three years ago, Hundertmark said.

[Alaska has 32 caribou herds](#), widely ranging in size and population trends. The largest -- the western Arctic Caribou Herd -- is also the biggest in North America, but it's shrinking. The herd peaked at 490,000 animals in 2003, but eight years later, a census by the Alaska Department of Fish and Game counted just 325,000 caribou.

Alaska's smallest herds, the Beaver Mountain herd in western interior Alaska and the Fox River herd on the Kenai Peninsula, have 70 and 75 animals respectively, according to Fish and Game. Another relatively small herd, the [Denali herd in Denali National Park](#), numbers 2,300 animals, its highest population since 1992, according to the National Park Service.

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