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Posted on December 16, 2013 by Bob Berwyn

*Some herds likely to lose most of their habitat as climate warms*



Reindeer are adapted to life in cold, snowy climates. Photo courtesy USGS.

### By Summit Voice

FRISCO — Digging deep into the genetics of caribou populations, scientists said the animals could disappear from most of their range in southern and eastern Canada in the next 60 years, as climate change fragments habitat.

The study, published Dec. 15 in the journal *Nature Climate Change*, found that caribou populations in the most climatically stable areas had the greatest genetic diversity. Climate projections, combined with the new genetic data, suggest the animals won't fare well in the coming in decades.

"Caribou can respond to habitat change in three ways," said Kris Hundertmark, co-author and wildlife biologist-geneticist at the [Institute of Arctic Biology](#) at the [University of Alaska Fairbanks](#). "They can move to new, suitable habitat, adapt to the changed habitat or die.

"When a population loses genetic diversity, they lose the ability to adapt to change," Hundertmark said, adding that although Alaska herds are expected to fair slightly better at least in the near future, they are still facing significant challenges.

"Climate change in Alaska means we're going to see more fires and while that's bad for moose, it's really bad for caribou," said Hundertmark, "because it's good for lichen beds that can take at least 50 years to recover and reduce viable habitat."

Hundertmark and then-graduate student Karen Mager collected 655 tissue samples from 20 of Alaska's 32 herds developed genetic profiles of Alaska's caribou

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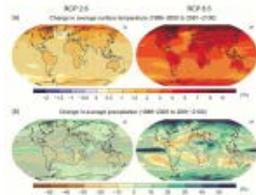
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credit a successful collaboration with state and federal fish and game biologists and hunters over several years with making sample collection possible.

The scientists, part of a team headed by researchers at [Laval University](#) in Quebec, used climate reconstructions from 21,000 years ago to the present to predict where caribou habitat would likely exist and they matched reservoirs of high genetic diversity to areas with the most stable habitat over time.

Bolstered by the success of their retrospective analysis the scientists forecasted caribou habitat to the year 2080 using a 'business-as-usual' climate model – the [Intergovernmental Panel on Climate Change's](#) A1B model. The outcome

“Those caribou herds that shift their range to remain within their habitat and those herds that are reduced in size and become isolated from neighboring herds are those most threatened with loss of genetic diversity,” said Hundertmark. “That is why it is important to know what areas will be have the most habitat stability in the future.”

The team predicts that viable caribou habitat will shift north, the southernmost herds will disappear and herds in northeastern North America will become more threatened with extinction, losing up to 89 percent of their current habitat.

Caribou in western North America will also be affected, although to a lesser extent, and have a better chance of retaining what remains of genetic diversity and therefore adaptability to change.

“This study gives us strong evidence from a widespread species that the stability of the climate makes a difference in the amount of genetic diversity retained within a species,” said Mager.

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