New bone survey method could aid long-term survival of Arctic caribou

March 27 2013, by Danielle Torrent

A study co-authored by a University of Florida scientist adds critical new data for understanding caribou calving grounds in an area under consideration for oil exploration in Alaska's Arctic National Wildlife Refuge.

The research may be used to create improved conservation strategies for an ecologically important area that has been under evaluation for natural resource exploration since enactment of the Alaska National Interest Lands Conservation Act in 1980.

By studying bone accumulations on the Arctic landscape, lead author Joshua Miller discovered rare habitats near river systems are more important for some caribou than previously believed. The study appearing online today in the journal *Proceedings of the Royal Society B* shows bone surveys conducted on foot provide highly detailed and extensive data on areas used by caribou as birthing grounds.

"The bone surveys are adding a new piece of the puzzle, giving us a way of studying how caribou use the landscape during calving and providing a longer perspective for evaluating the importance of different regions and habitats," said Miller, an assistant scientist at the Florida Museum of Natural History on the UF campus and a Fenneman assistant research professor at the University of Cincinnati.

Unlike other species in the deer family, both male and female caribou grow antlers. Males shed them after they mate, while pregnant females

keep their antlers until they calve, losing them within a day or two of giving birth. Newborn caribou calves also suffer high mortality rates within the first couple days of birth. The female antlers and newborn skeletal remains offer a unique biological signal for understanding calving activity, Miller said.

"This new tool has a lot of potential, and the idea that these bones are providing new information is really exciting—bone surveys allow us to go into the field today and collect historical information about ecosystems and animal communities that are sometimes only known from a few years of observation," Miller said.

Miller recorded evidence of shed caribou antlers and newborn skeletons from the Porcupine Caribou Herd in area 1002 on the coastal plain of the Arctic Refuge, which comprises about 1.5 million acres on Alaska's northeast border. Because these high-latitude habitats are frozen nearly three-quarters of the year, bones may be preserved on the landscape for hundreds or thousands of years, researchers said.

Testing two different habitats, the tussock tundra and riparian terraces, researchers found the latter has higher concentrations of shed female antlers and numerous newborn skeletons. The data suggests these terrace habitats are used more during some portions of the calving period than other areas traditionally viewed as primary calving terrain, which is important because they comprise less than 10 percent of the Arctic National Wildlife Refuge calving grounds, Miller said.

"Bone surveys are suggesting that these riparian zones should be under special consideration as we think about how to manage the Arctic Refuge and ensure this herd prospers in the decades and centuries to come," Miller said.

The Porcupine Caribou Herd includes as many as 170,000 animals that

are essential parts of the delicate Arctic ecosystem. These large, herbivorous, hoofed mammals are an important food source for many indigenous northern peoples and natural predators, including wolves, bears and eagles.

Anna Behrensmeyer, vertebrate paleontology curator at the Smithsonian Institution's National Museum of Natural History, said that using skeletal remains as a research tool is important because it helps scientists understand which habitats need protection with minimal disruption to caribou calving. It also allows researchers to collect historical information that may be used to better understand how climate change and other human influences have affected how these animals use the landscape over time.

"We tend to think that what we see now is normal, but we're just seeing a little bit of time," said Behrensmeyer, who was not involved with the study. "Josh's work can extend our time window back maybe hundreds of years, so there's the chance of seeing long-term cycles in the calving areas and also correlating those cycles with climate – if you can look back into the past, you might see what this species did to adapt its reproductive strategies to warmer or colder climate periods."

Provided by University of Florida

Citation: New bone survey method could aid long-term survival of Arctic caribou (2013, March 27) retrieved 26 April 2024 from https://phys.org/news/2013-03-bone-survey-method-aid-long-term.html