

Your Yukon

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Elk pioneers may have led humans into North America



Ancestors of this elk crossed the Beringia Land Bridge into Alaska and Yukon 15,000 years ago. Government of Yukon photo

Five years ago, paleogeneticist Meirav Meiri, then a graduate student at Royal Holloway, University of London, working with the British Natural History Museum, embarked on a project that sent an international team of scientists on an elk hunt. The results of that initiative were recently published in *Proceedings of the Royal Society, B, Biological Sciences*.

That research generated exciting new ideas about elk distribution, about mammal migration across the Beringia Land Bridge, and about human migrations from Asia into North America.

Yukon, with its strategic location along ice age migration routes and its growing collection of Pleistocene fossils, was a valuable team member, and territorial paleontologist Grant Zazula is listed among the many authors of the paper.

Somewhere back in the Pleistocene, elk populations separated; the European red deer became a subspecies, as did the Asian ancestors of today's wapiti, the iconic North American elk (*Cervus canadensis*), says Zazula. "It has long been established that North American elk were a late invader of North America, but it wasn't really established just when they got across the land bridge."

There are a few sites in the Lower 48 where elk remains were thought to have been found in archeological sites that had once been dated back to well before 15,000 years ago. Some people thought that there were a few different elk migrations into North America, Zazula says. "It was determined in this project that all those earlier reported elk were actually not elk; they were bison or some other ice age mammal."

The remains of elk in Alaska and Yukon carbon date to about 15,000 years ago and precede a period of significant human migration into the region by only about 1,000 years. Some archeologists had suggested a relationship between elk and early people but that theory wasn't seriously pursued until now, Zazula says.

The ancestors of today's Northern American elk moved into far northeastern Asia about 50,000 years ago. They expanded into Siberia during a relatively warm period in the ice age, which they enjoyed until about 25,000 years ago. After that, "the populations really took a hit."

Some elk likely retreated back southward, says the paleontologist. "But we know from genetic continuity in the data that some of them stayed in northern Siberia and somehow they were able to survive the harsh, cold, dry conditions – probably in the river valleys where there were still some shrubs surviving."

But why did the elk remain on the west side of the land bridge for more than 30,000 years and not cross east into Alaska until 15,000 years ago? They were, after all, living on the edge of the bridge. "It had to have something to do with habitat on the land bridge itself," Zazula says.

He stresses that the bridge was not what we might picture today, short and narrow, but a terrain that extended for more than 1,500 kilometres, and was "just another extension of the landscape the elk were already on." The intermediate area between Asia and Alaska was probably a more harsh environment than what was on either side.

What changed 15,000 years ago? "Globally climates warmed up and glaciers started to melt, the Bering Land Bridge started to flood and conditions all across the Arctic went from cold, dry mammoth steppe until, basically, it was shrubby tundra – lots more nutrients on the ground for elk," says the scientist. The damp conditions that led to the flooding and disappearance of the land bridge made crossing more bearable during a narrow window between 15,000 and 11,000 years ago, at the end of the Pleistocene.

And if it was more bearable for browsers like elk, it may well have been for other species as well, most notably, humans. "What we argue in this paper is that this provides a good model for how and when, and more important, why people were not able to cross the land bridge until that time," says Zazula. The first elk remains on the Alaska and Yukon side date from about 15,000 years ago; the first verifiable archeological sites show up about 1,000 years later. Those

sites contain fossil evidence of heavy human predation on elk at a time when mammoth and horses were beginning to disappear along with the dry Arctic steppes.

A warming climate benefitted wandering hunters in another way. “One of the things that people need, in order to build tools, is wood,” says Zazula. “It’s really hard to build hunting implements without any woody vegetation. If your spear shaft breaks, you’re screwed.” Also, wood is a light, portable fuel for fire. People did burn bones and mammoth dung, but with much more effort for less heat.

The move southeast by elk and their human predators wasn’t a mad dash, though carbon dating reveals that elk reached Montana about 12,000 years ago. “A thousand years in archeological time doesn’t seem very much, but 1,000 years is several generations of people. So think of a human migration of 3,000 kilometres in a thousand years. They’re not pushing the boundaries, they’re actually pushing a just little further out.”

Among other discoveries made by the elk researchers were the 500-year-old remains of an elk at 71 degrees north. That’s well above the Arctic Circle, on the Arctic coast of Siberia and very recent. Today, elk don’t live much further north than Whitehorse, and those are the descendents of elk imported in several increments from Alberta since 1950.

(www.env.gov.yk.ca/animals-habitat/mammals/Elk.php)

In Yukon and Alaska the most recent radio carbon date for elk bones is about 5,000 years ago. When explorers like Frederick Schwatka arrived here in the late 19th century, they saw no elk. Perhaps our fossil record is incomplete because the warmer ground doesn’t preserve bones as well as earth did during the ice ages. At any rate, says Zazula, there was something happening in more recent times prior to the arrival of European people that led to local extinctions, including those of bison and musk ox.

“Based on what we know of the Yukon and Alaska over the last 5,000 years, there doesn’t seem to be any pronounced environmental or climatic reason the elk are gone.”

Once again, science has followed a spate of answers with yet more tantalizing questions.

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