

Early humans linked to large-carnivore extinctions

Hominins could have triggered broad changes to the numbers and diversity of meat-eaters in Africa, researcher says.

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26 April 2012

Animal lovers around the world know modern otters as cute, playful and unthreatening. But the mustelid's giant cousins in ancient Africa may have engaged in a life-and-death competition with humanity's ancestors — and come out on the losing end.

The demise of the gigantic 'bear otter' (*Enhyriodon dikikae*) was part of a broader decline in large-carnivore diversity in Africa, which accelerated around 2 million years ago — roughly the time that the first representatives of the genus *Homo* appeared on the scene. Lars Werdelin, a curator at the Swedish Museum of Natural History in Stockholm has been building a case that our forebears had something to do with the change. Although direct evidence of any causal connection is sorely lacking, Werdelin says, the transition in the carnivore fossil record coincides nicely with advances in tool-making and dietary shifts among early hominins.



Illustration by Victor Leshyk

The 200-kilogram 'bear otter' is one of several large carnivores that became extinct around 2 million years ago.

"The way I see it, this is one of the first ways in which we manipulated our environment on a large scale," says Werdelin, who presented his latest findings at a symposium on human evolution and climate change at Columbia University's Lamont-Doherty Earth Observatory in Palisades, New York. Werdelin argues that hominins may have competed indirectly with some of these carnivores by occupying prime habitat, thus forcing the animals to change their behavior without ever coming into direct contact with them. In some cases, the hominins may have out-competed carnivores directly by forcing them to surrender fresh kills. Regardless, the emergence of early humans could have cascaded through the food chain — ultimately wiping out many of Africa's larger meat-eaters.

It will be difficult to prove that our hominin ancestors had a substantial impact at such an early point in human evolution. After all, scientists are still arguing about the extent of humanity's role in a spate of megafauna extinctions that took place near the end of the Pleistocene epoch, roughly 50,000–12,000 years ago, when fully modern humans were spreading across the globe. The fossil record suggests that a far smaller population of *Homo habilis* and other human relatives were roaming the African landscape 2 million years ago.

"It's a really interesting study, and I think it will trigger additional research along these lines," says René Bobe, an anthropologist at the George Washington University in Washington DC. At the same time, early hominins left scant traces of their presence, which will make it hard to say anything conclusive. "It could be true," Bobe says of Werdelin's hypothesis, "but we certainly don't have the data to show it."

Werdelin presented unpublished data on fossilized teeth, jaws and skulls recovered from archaeological sites around Africa. He has found evidence that up to about 3 million years ago, around 19 large carnivore species — including otters, civets and a bear — existed on the continent. By 2.5 million to 1.5 million years ago, the number had dropped to 15. More importantly, he says, there was a marked reduction in the diversity of large carnivores and the ecological niches they filled around 2 million years ago. Before this change, there were many different kinds of hunters and scavengers that mixed a variety of plants and fruits or fish into their diets, he says. The record after 2 million years ago shows that a greater proportion of predators by then were principally meat-eaters.

Many researchers suggest that the landscape in East Africa may have changed substantially around the same time, becoming drier with more open savannahs, but Werdelin says he sees no evidence that changes in climate and vegetation drove the large-carnivore extinctions. The diversity of smaller predators increased throughout the same period, he points out.

Large herbivores such as antelope, elephants and precursors to modern pigs all underwent their own shift during this period. After adapting to the open savannahs, herbivores thrived in the open grassland environment for about a million years before they, too, started to disappear. The fall of the woolly mammoth and other large animals of the late Pleistocene was just “the last straw in a pattern of extinctions that had been going on for some time”, Boe says. Early humans might have had a role throughout, he adds, “but there were probably other factors as well.”

Whatever the causes, the effects can still be seen in the fossil record, Werdelin says, and in the greatly reduced diversity that has continued up to the present. “Today we have six large carnivore species in Africa, and they are all very similar,” he says. “They hunt down large herbivores.”

Nature | doi:10.1038/nature.2012.10508