

Extinction of ice age giants likely drove surviving animals apart

November 21 2019, by Aniko Blanka Toth



Extinction of the woolly mammoth and other megafauna caused surviving animals to go their separate ways. Credit: Wikimedia

As the world grapples with an extinction crisis, our large mammals are among the most endangered. These threatened species—rhinos, pandas, tigers, polar bears and the like—greatly influence their ecosystems. So what will happen to the smaller animals left behind?

Clues from a past megafaunal [extinction](#) could give us the answer.

Thousands of years ago, many large mammals went extinct including mammoths, saber-toothed cats and Australia's giant wombat. The extinctions happened at different times, shortly after human colonization on each continent.

A study I led, [published in the journal *Science*](#), has found after the megafauna disappeared, many surviving [mammal species](#) went their separate ways. This weakened connections between species and may have made ecosystems more vulnerable.

As human activity drives modern megafauna towards extinction, our study gives valuable insights into the potential repercussions for smaller survivors.

Surprise results

Our team analyzed the [fossil records](#) of 93 [mammal](#) species at hundreds of sites in North America, dating back up to 21,000 years, before the extinctions began.

We then determined the extent to which a particular species lived alongside others at each site. We found that after the extinction of large mammals, smaller mammals often distanced themselves from neighboring species and were found together much less often than expected.

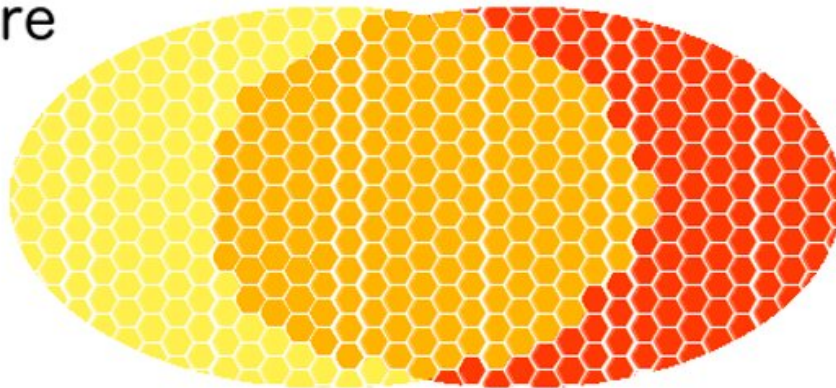
Surprisingly, this separation occurred while many survivors were claiming new habitats after the extinctions—which meant the potential space for co-habitation had actually increased.



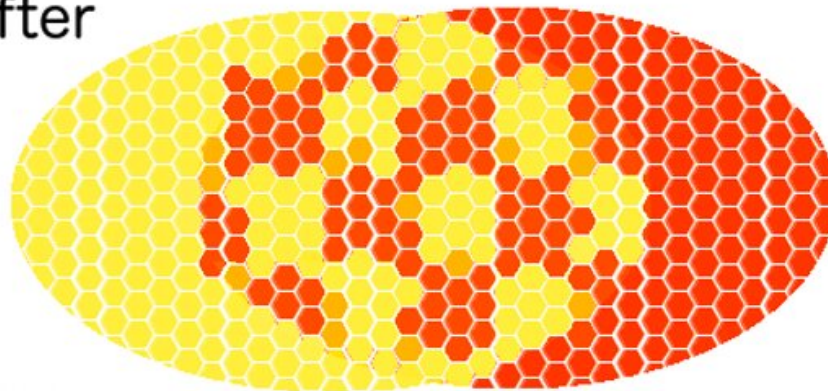
Many large mammals, such as the polar bear, are at risk of extinction. Credit: Henry H. Holdsworth/Natural Habi

The below diagrams show how [animal species](#) may have lived alongside each other before and after the megafauna extinctions. In the first, two species occupied the same area while co-habiting (orange sites). In the second, animals occupied the same area but were more segregated (red and yellow sites).

Before



After



Credit: Anikó Tóth

Such segregation suggests a change in interactions between species after the extinction event. Survivors may have rapidly become more abundant as large mammals disappeared, causing more competitive interactions. This could have prompted them to exclude each another from individual sites.

Our analysis suggests the repercussions of megafauna extinctions are still being felt today—leading to species increasingly segregated across

continents, and interacting more opportunistically.

Animals need each other

Connections between species large and small are the lifeblood of a functioning ecosystem, making it stable and resilient. Today's large mammals are comparatively smaller than the megafauna of the last ice age. However, they still play a vital role in shaping ecosystems.

Just like in the past, modern large mammals may carry out pest control, aid seed dispersal and spread nutrients (by walking long distances and pooping out digested vegetation). This benefits humans and other species.

Some large animals also shape and create homes for others. For example, elephants in Africa push over trees to create open grasslands, much like their Pleistocene-era cousin, the Columbian mammoth. This enables other species adapted to grasslands, such as gazelles and zebras, to share the habitat.

If elephants became extinct and no longer pushed over trees, grasslands would change and remaining animals may die or move away. In this way, the loss of interactions may make the ecosystem less stable and more vulnerable.

And animal extinctions have a snowball effect when it comes to species interactions. If half the species in a community go extinct, at least three quarters of the possible interactions in the system die with them.

Lessons for Australian conservation

Although our study was restricted to North America, its findings have

the potential to inform conservation efforts in Australia and shine a light into the past.

Australia's fossil record and historical accounts document many species of [large mammals](#) which have become extinct. For example, more than 40,000 years ago humans [wiped out large carnivores](#) such as the marsupial lion and more recently, the Tasmanian tiger.

People also introduced invasive medium-sized carnivores such as foxes and feral cats, the spread of which went unchecked for years. This devastated the unique and diverse suite of smaller Australian marsupials.

Today, the extermination of feral cats is a major conservation problem in Australia. Had the marsupial lion still been around, [feral cats](#) may have been killed and marginalized by these larger [animals](#), slowing their spread.

When planning animal conservation and management, it may be just as important to protect interactions as it is to save individual species. When introducing or eliminating [species](#) as part of environmental initiatives, it's crucial to consider all possible interactions we are adding, as well as those we are taking away.

More information: Anikó B. Tóth et al. Reorganization of surviving mammal communities after the end-Pleistocene megafaunal extinction, *Science* (2019). [DOI: 10.1126/science.aaw1605](https://doi.org/10.1126/science.aaw1605)

This article is republished from [The Conversation](#) under a Creative Commons license. Read the [original article](#).

Provided by The Conversation

Citation: Extinction of ice age giants likely drove surviving animals apart (2019, November 21)
retrieved 10 April 2024 from

<https://phys.org/news/2019-11-extinction-ice-age-giants-drove.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.