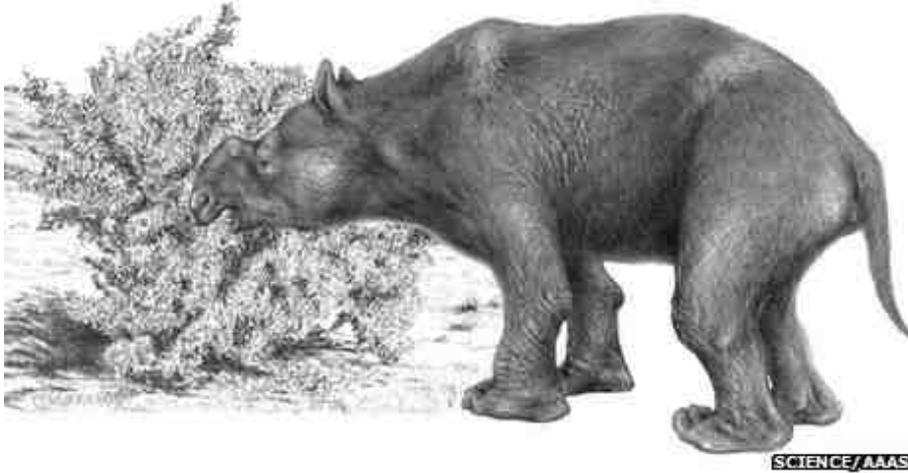


24 March 2012 Last updated at 10:16 GMT

'Humans killed off Australia's giant beasts'



Scientists have linked a dramatic decrease in spores found in herbivore dung to the arrival of humans in Australia 41,000 years ago

Humans hunted Australia's giant vertebrates to extinction about 40,000 years ago, the latest research published in *Science* has concluded.

The cause of the widespread extinction has provoked much debate, with climate change being one theory.

However, scientists studied dung samples from 130,000 and 41,000 years ago, when humans arrived, and concluded hunting and fire were the cause.

The extinction in turn caused major ecological changes to the landscape.

The scientists looked at pollen and charcoal from Lynch's Crater, a sediment-filled volcanic crater in Queensland that was surrounded by tropical rainforest until European settlement.

They found *Sporormiella* spores, which grow in herbivore dung, virtually disappeared around 41,000 years ago, a time when no known climate transformation was taking place.

At the same time, the incidence of fire increased, as shown by a steep rise in charcoal fragments.

It appears that humans, who arrived in Australia around this time, [hunted the megafauna to extinction, the scientists said.](#)

The megafauna included three-metre tall giant kangaroos and marsupial lions, as well as giant birds and reptiles.



A browsing kangaroo was among the vertebrates hunted to extinction, scientists believe Susan Rule of the Australian National University in Canberra and her colleagues concluded that vegetation also changed with the arrival of humans.

Mixed rainforest was replaced by leathery-leaved, scrubby vegetation called sclerophyll.

But these changes to the landscape took place after the animal extinctions, indicating that they were the result of the extinction and not its cause, they said.

Human-lit fire - deliberately targeted and more frequent than lightning - had a devastating effect of plants that had previously been protected.

"Any climate change at those times was modest and highly unlikely to affect the outcome," author Matt McGlone wrote in *Science*.

Lead research author Chris Johnson, from the School of Zoology at the University of Tasmania, said the research raised further questions about the ecological impact of the extinction.

"Big animals have big impacts on plants. It follows that removing big animals should produce significant changes in vegetation."

The removal of large herbivores altered the structure and composition of vegetation, making it more dense and uniform, he said.

"Getting a better understanding of how environments across Australia changed as a result of megafaunal extinction is a big and interesting challenge, and will help us to understand the dynamics of contemporary Australian ecosystems."

'Utter havoc'

Dr John Alroy, from the Department of Biological Sciences, Faculty of Science at Macquarie University, New South Wales, said the debate about whether humans contributed to widespread extinction should "be over now".

"But it has dragged on for nearly a half-century now because the idea that stone age hunters could cause such utter havoc across three entire continents over very short time spans strikes many people as incredible.

"Like it or not, though, it's the truth, and it's time for us to all confront it."

However, Gavin Prideaux, a lecturer in vertebrate palaeontology in the School of Biological Sciences at Flinders University, South Australia, said further research was necessary.

He said the latest study "supports a mounting number of studies that have argued that climate change was not primarily responsible for the Late Pleistocene extinctions in other parts of the continent.

"To test the inferences from this paper we might look at similar lake records from other regions of Australia and seek fossil deposits in the northeast that preserve bones of the giant animals themselves."