

# Giant moa had climate change figured out

August 6 2012

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University of Adelaide researchers in a New Zealand cave. Photo by Jamie Wood.

(Phys.org) -- An international team of scientists involving researchers from the University of Adelaide has used ancient DNA from bones of giant extinct New Zealand birds to show that significant climate and environmental changes did not have a large impact on their populations.

The [population size](#) of the giant moa remained stable over the past 40,000 years until the arrival of humans in New Zealand around 1280

AD.

The study was undertaken by researchers from the University of Adelaide's Australian Centre for Ancient DNA, the University of Colorado, and the University of Waikato and Landcare Research in New Zealand. The results are published online today in the journal *Quaternary Science Reviews*.

The giant birds - measuring up to 2.5 metres high and weighing 250 kilograms - were the largest herbivores in New Zealand's pre-human environment but were quickly exterminated after the arrival of Polynesian settlers.

"Until now it has been difficult to determine how megafauna responded to environmental change over the past 50,000 years, because human arrival and climate change occurred simultaneously in many parts of the world," says Dr Nic Rawlence, lead author of the study and a postdoctoral research fellow from the Australian Centre for Ancient DNA and the University of Waikato.

"Using [ancient DNA](#), radiocarbon dating and stable dietary [isotope analysis](#), we have been able to show that before humans arrived, moa mitigated the [effects of climate change](#) by tracking their preferred habitat as it expanded, contracted and shifted during warming and cooling events," Dr Rawlence says.

"Moa were not in serious decline before humans arrived, as has been previously suggested, but had relatively stable population sizes. The overwhelming evidence suggests that the extinction of moa occurred due to overhunting and habitat destruction, at a time of relative climatic stability."

Co-author of the study, Dr Jamie Wood from Landcare Research, says

the results "show that range shifts and minor population fluctuations observable in the fossil and genetic record are a natural response to environmental change and do not necessarily lead to extinction".

"Climate change has been blamed for megafaunal extinctions in other parts of the world, but this is not the case for moa," says co-author Dr Jessica Metcalf from the University of Colorado.

ACAD Director and project leader Professor Alan Cooper says: "The very recent extinctions in New Zealand provide a unique opportunity to examine the extinction of Ice Age megafauna and the relative roles of human hunting and [climate change](#)."

**More information:** [www.journals.elsevier.com/quat ... ary-science-reviews/](http://www.journals.elsevier.com/quat ... ary-science-reviews/)

Provided by University of Adelaide

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