

Early humans single-handedly nudged out New Zealand megafauna

December 9 2014, by Kerry Faulkner



The primary causes for the moa becoming extinct were hunting and burning habitat. Credit: Jeannie Fletcher

A small human population which initially inhabited New Zealand swiftly caused the extinction of the country's flightless bird, the moa (Aves:Dinornithiformes), according to recent international research.

Curtin University Department of Environment and Agriculture Professor Mike Bunce says this finding has important repercussions because it shows clearly a small [human population](#) can have a massive ecological impact, with the ability to wipe out a species over three or four generations.

Prof Bunce led a research team investigating the [extinction](#) of the native moa using an innovative 'multi-disciplinary' approach that combined carbon dating and genetics to plot the demise of the species, compared to [human](#) population growth.

He says New Zealand is a 'fascinating place' to study evolutionary processes since it was populated as recently as 700 years ago.

Previous research shows the moa population was increasing before human settlement, after which half the bird species became extinct.

Prof Bunce says extinction is rarely caused by one factor but a combination of them.

The primary causes for the moa becoming extinct were hunting and burning habitat.

"Extinction was incredibly rapid when humans arrived," he says.

"There's lots of debate now raging about extinction around the globe and what drives it; is it climate, humans or is it a combination of both or is it disease?"



A Moa bone. Credit: M. Allentoft/Curtin University

"The arrival of Polynesians didn't occur until 700 years ago and there was nothing going on with the climate before that so we can take that out as a factor.

"So it's a very clear-cut example of humans causing extinction either directly or indirectly.

"It happened incredibly rapidly at a time when the human population could not have grown past 2000 individuals."

The scientists excavated bones and egg shells from paleontological and archaeological sites to identify the species.

They then used carbon dating to pin point how old the animals were when they died.



The scientists excavated bones and egg shells from paleontological and archaeological sites to identify the species. Credit: M. Allentoft/Curtin University

"We tried to use those dates to model the extinction timeline and compared that to human population," Prof Bunce says.

"It helps us nail down the arrival date of humans and the disappearance of moa or when they last turn up at [archaeological sites](#).

"Once we modelled the human population sizes, we could show it was quite a small population of humans that was capable of doing that and this has implications for understanding extinction elsewhere.

"The lesson is human impact on a megfaunal species can be incredibly rapid.

"It also shows value in using multidisciplinary approach to tackle these questions of the cause.

More information: "An extremely low-density human population exterminated New Zealand moa." *Nat Commun.* 2014 Nov 7;5:5436.
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