

New Zealand's flightless birds are retreating to moa refuges

July 25 2024, by Johnny von Einem



Crested Moa. *Pachyornis australis*. Credit: From the series Extinct Birds of New Zealand., 2005, Masterton, by Paul MarSnsen. Te Papa (2006-0010-1-19)

Researchers have found New Zealand's endangered flightless birds are seeking refuge in the locations where six species of moa last lived before

going extinct.

An international team of researchers, led by scientists from the University of Adelaide, used fossils and computer modeling to make the discovery, shedding light on a mystery with important conservation benefits.

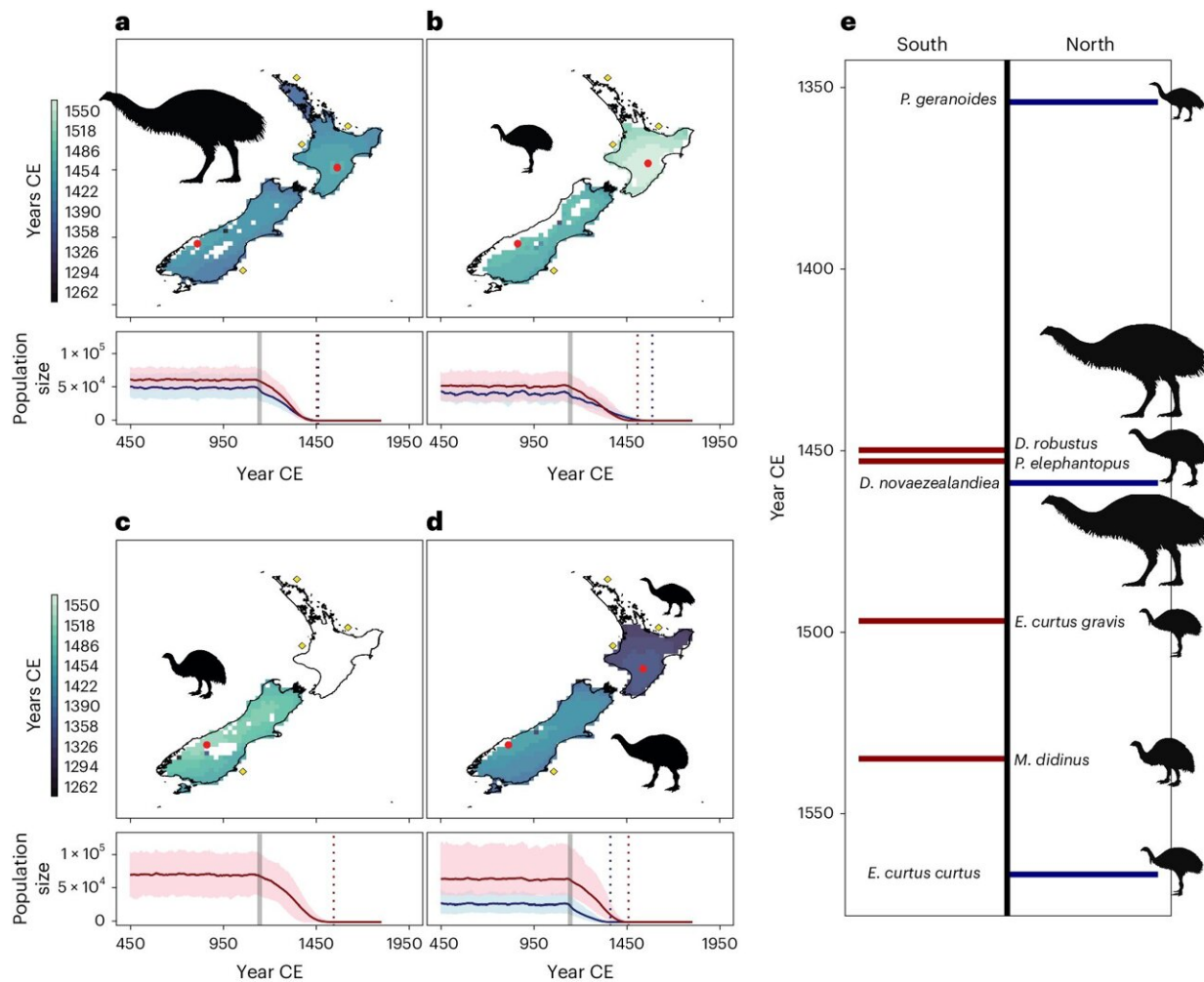
"Our research overcame past logistical challenges to trace the [population dynamics](#) of six species of moa at resolutions not considered possible before," said senior author Associate Professor Damien Fordham, from the University of Adelaide's Environment Institute.

"We did this by combining sophisticated computational models with extensive fossil records, paleoclimate information, and innovative reconstructions of colonization and expansion of people across New Zealand.

"Our research shows that despite large differences in the ecology, demography and timing of extinction of moa species, their distributions collapsed and converged on the same areas on New Zealand's North and South Islands."

This recent discovery, [published](#) in *Nature Ecology & Evolution*, found these moa graveyards to be in the same isolated, cold, mountainous environments that today harbor many of the last populations of New Zealand's most threatened flightless birds. These include Mount Aspiring on the South Island, and the Ruahine Range on the North Island.

"Populations of moa are likely to have disappeared first from the highest quality lowland habitats that Polynesian colonists preferred, with rates of population declines decreasing with elevation and distance traveled inland," said lead author Dr. Sean Tomlinson, from the University of Adelaide.



Inter-specific variation in rate of range contraction and population decline.
 Credit: *Nature Ecology & Evolution* (2024). DOI: 10.1038/s41559-024-02449-x

"By pinpointing the last populations of moa and comparing them with distributions of New Zealand's living flightless birds, we found that these last havens shelter many of today's persisting populations of takahē, weka and great spotted kiwi."

"What's more, these ancient refugia for moa overlap with the last

mainland populations of the critically threatened kākāpō".

Although recent drivers of the decline of New Zealand's native flightless birds are different from those that caused the ancient extinctions of moa, this research shows that their spatial dynamics remain similar.

"The key commonality among past and current refugia is not that they are optimal habitats for flightless birds, but that they continue to be the last and least impacted by humanity," said author Dr. Jamie Wood, also from the University of Adelaide's Environment Institute.

Like earlier waves of Polynesian expansion, habitat conversion by Europeans across New Zealand, and the spread of the animals they brought, was directional, progressing from lowland sites to the less hospitable, cold, mountainous regions."

This new research shows that the ghosts of species past can provide invaluable insights for [conservation efforts](#) directed at New Zealand's living [flightless birds](#), highlighting the immense importance of protecting remote, wild places.

It also provides an important new method for understanding past extinctions on islands where fossil and [archaeological data](#) are limited, which is the case for most Pacific Islands.

More information: Sean Tomlinson et al, Ecological dynamics of moa extinctions reveal convergent refugia that today harbour flightless birds, *Nature Ecology & Evolution* (2024). [DOI: 10.1038/s41559-024-02449-x](https://doi.org/10.1038/s41559-024-02449-x)

Provided by University of Adelaide

Citation: New Zealand's flightless birds are retreating to moa refuges (2024, July 25) retrieved 26 July 2024 from <https://phys.org/news/2024-07-zealand-flightless-birds-retreating-moa.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.