

Climate change driving tropical birds to higher elevations

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Tropical birds are moving to higher elevations because of climate change, but they may not be moving fast enough, according to a new study by Duke University researchers.

The study, published Thursday in the peer-reviewed online journal [PLoS ONE](#), finds that the birds aren't migrating as rapidly as scientists previously anticipated, based on recorded temperature increases.

The animals instead may be tracking changes in vegetation, which can only move slowly via [seed dispersal](#).

"This is the first study to evaluate the effects of warming on the elevation ranges of tropical birds," said Stuart Pimm, Doris Duke Professor of conservation ecology at Duke's Nicholas School of the Environment and a co-author of the study. "It provides new evidence of their response to warming, but also shows there is a delay in their response."

Evidence from temperate areas, such as North America and Europe, shows that many animal and plant species are adapting to [climate change](#) by migrating northward, breeding earlier or flowering earlier in response to rising temperatures.

"However, our understanding of the response of tropical birds to warming is still poor," said German Forero-Medina, a Ph.D. student at Duke's Nicholas School who is lead author of the new study. "Moving to

the north doesn't help them, because tropical temperatures do not change very much with latitude. So moving up to higher elevations is the only way to go, but there are few historical data that can serve as baselines for comparison over time."

What is going on with [tropical species](#) at higher altitudes is important, Forero-Medina said, because about half of all birds species live 3,500 feet or more above sea level, and of these species, more than 80 percent may live within the tropics.

In 2010, the authors of the new study and a team of biologists participated in an expedition to the summit of the remote Cerros del Sira mountains in central Peru – a place visited by only a few ornithologists on prior occasions. The complex topography, geology and climate of the mountains have produced isolated patches of habitat with unique avian communities and distinct taxa.

Forero-Medina and his colleagues used survey data collected on bird species in the region in the 1970s by John Terborgh, research professor emeritus at Duke, to compare past and present distributions.

"Using John Terborgh's groundbreaking data -- the first ever collected from this region --gave us a unique opportunity to understand the effects of 40 years of warming on [tropical birds](#)," Forero-Medina says.

The biologists found that although the ranges of many bird species have shifted uphill since Terborgh's time, the shifts fell short of what scientists had projected based on temperature increases over the four decades.

"This may be bad news," Pimm said. "[Species](#) may be damned if they move to [higher elevations](#) to keep cool and then simply run out of habitat. But, by staying put, they may have more habitat but they may

overheat."

More information: "Elevational Ranges of Birds on a Tropical Montane Gradient Lag Behind Warming Temperatures" German Forero-Medina, John Terborgh, S. Jacob Socolar & Stuart L. Pimm. *PLoS ONE*, Dec. 7, 2011.

Provided by Duke University

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