

# Changes in bird behavior linked to climate change

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A new study from researchers at The Australian National University (ANU) rolls back the curtain on half a century of evidence detailing the impact of climate change on more than 60 different bird species.

It found that half of all changes to key physical and behavioral bird characteristics since the 1960s can be linked to [climate change](#). The other 50% is due to other unknown environmental factors that have changed at the same time as our climate.

The research, published in the *Proceedings of the National Academy of Sciences* and carried out in conjunction with James Cook University (JCU), focused on birds in the United Kingdom and the Netherlands.

"We have shown that climate change is a major driver of these changes in the birds, but there is more at play here than we originally thought," lead author Dr. Nina McLean, from the ANU Research School of Biology, said.

"Not only were other unknown changes in the environment equally important in driving changes in the birds, surprisingly they generally did so in the same direction as climate change, such that their effects compounded.

"This study shows that the [impact of climate change](#) does not act in isolation and its effects are occurring in a world where the resilience of wildlife is already pushed to the limits due to the many other challenges they are experiencing in a human-dominated landscape.

"These non-climate change driven factors could include urbanization, changing land use, habitat loss or introducing [invasive species](#) into ecosystems, but we can't know their identity for sure yet."

The researchers analyzed three key traits as part of their study: the timing of egg laying, body condition of birds, and the number of offspring produced. All the data was collected by volunteers, otherwise known as citizen scientists.

The study found that across the board almost all [birds](#) laid their eggs earlier because of climate change.

"For example, climate change caused chiffchaffs to lay their eggs six days earlier over the last 50 years, but other unknown environmental factors led to an additional six days, meaning in total they now lay their eggs 12 days earlier than they did half a century ago," Dr. Martijn van de Pol, from the JCU College of Science and Engineering, said.

Dr. McLean said there are "winners and losers" of these environmental changes driven by rising temperatures.

"For offspring number and body condition we see that it's a mixed bag," she said.

"Some [species](#) are clearly increasing their body condition and offspring number, whereas others are suffering from it.

"For example, garden warblers in the UK have experienced a 26% decrease in their average number of offspring over the past half century, which is really concerning for the long-term fate of this species, but only half of this reduction, 13%, can be attributed to [climate](#) change.

"By comparison, the redstart experienced a 27% increase in offspring numbers over the past half century, but again only part of that increase is due to global warming."

The researchers say continued global warming could present a "double whammy" for species that are already struggling to adapt to other non-climatic environmental changes.

"Rising temperatures, compounded with these unknown environmental factors, could pose a significant threat to the livelihoods of certain

species that are already suffering," says study co-author Dr. Loeske Kruuk from ANU.

**More information:** Nina McLean et al, Warming temperatures drive at least half of the magnitude of long-term trait changes in European birds, *Proceedings of the National Academy of Sciences* (2022). [DOI: 10.1073/pnas.2105416119](https://doi.org/10.1073/pnas.2105416119)

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