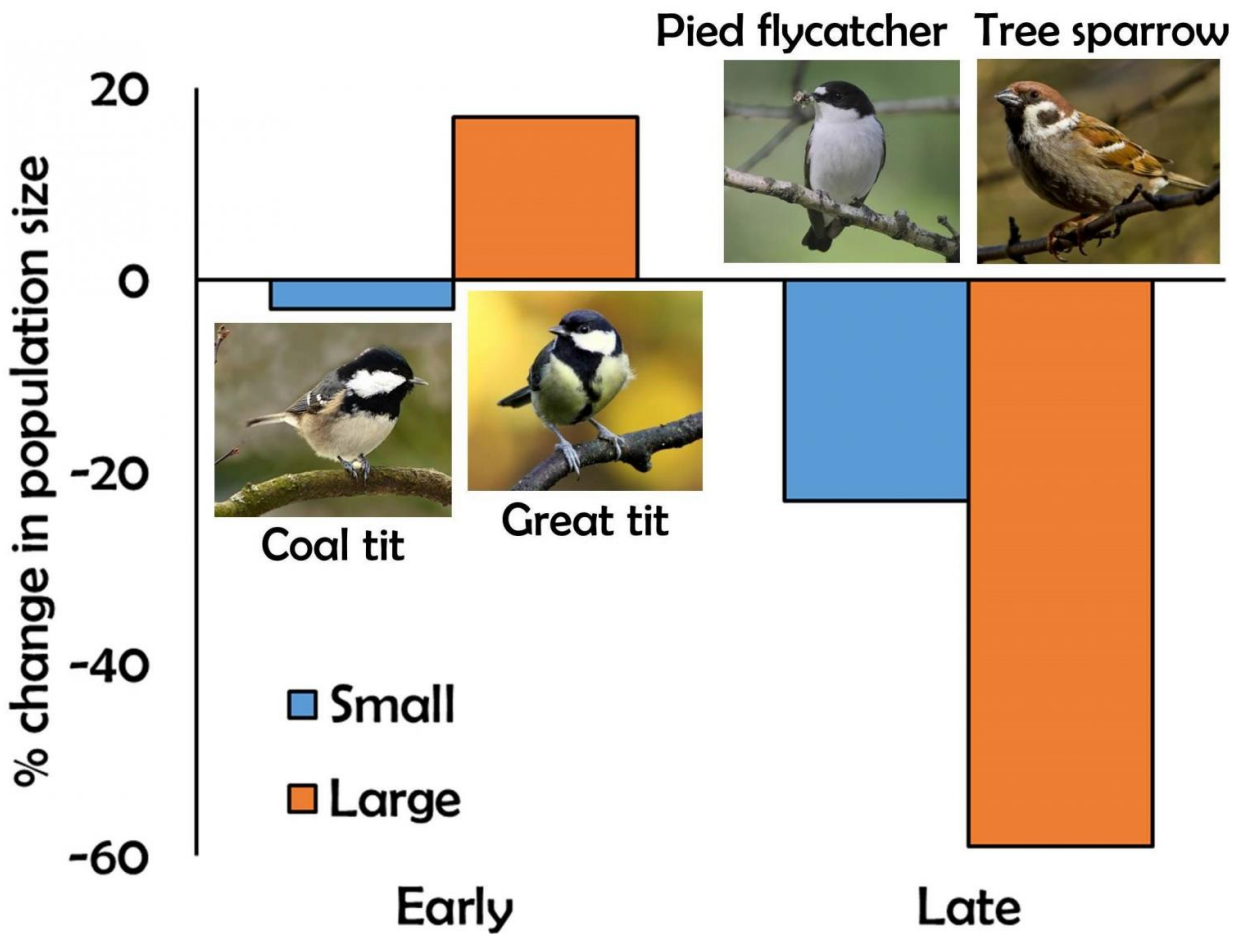


Late-nesting birds and bees face habitat threat

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Population change from 1980 to present day in Europe. Credit: University of Exeter

Bird and bumblebee species that nest late in the year are suffering more from the destruction of habitats, new research suggests.

With habitats such as hedgerows and hay meadows in decline in many countries, fewer [nest](#) sites are available—leading to more competition.

The University of Exeter study found that species which nest late—in April or May rather than February or March—are declining more than other species, with the larger birds and bumblebees worst affected.

The research goes some way to unravelling the mystery of why numbers of some closely related species—like the thriving chaffinch and the struggling goldfinch—are moving in different directions.

"The effects of habitat destruction are complicated, but we must understand them if we are going to save threatened species," said Dr Andrew Higginson, of the University of Exeter.

"The loss of nest sites due to damage to the environment is an important cause of [species extinctions](#).

"Ecologists understand why some groups of species are declining more, such as why farmland species are declining more than woodland species.

"But an enduring mystery is the big variation in the declines of closely related species.

"Fighting over nest sites may be part of reason—when nest sites are hard to come by, the species that will suffer most are that nest later in the year."

The study, published in the journal *Behavioural Ecology and Sociobiology*, combines mathematical modelling with an analysis of

population changes in 221 bird and 43 bumblebee species worldwide.

A mathematical model of searching for and fighting over nest sites was created. The model predicted when different species should fight for nest sites depending on their size, timing that they nest and the quality of the nest site.

The model shows that if animals are still doing what they did before habitat damage caused by decades of agricultural intensification, then large, early-nesting species such as great tits will be fine, but late-nesting species such as tree sparrows will decline.

"Surprisingly, the model predicts that the large species will suffer much more from being late nesters," said Dr Higginson. "This happens because large species know they can beat small species if they find a good nest site.

"So while smaller species settle for what they can find, the larger ones keep looking and end up failing to breed." Dr Higginson tested this prediction by collecting data on the declines of birds and bees over the 20th Century, their body size, and when and where they nest. Birds were in North America and Europe, and bumblebees were in five countries.

In all these data sets, the predictions of the model were supported. This suggests that the model is correct about how animals behave when looking for nest sites, and that nest sites are important in determining difference between species in their losses.

Speaking about the broader implications of the study, Dr Higginson said: "There are many resources other than nest sites which species share.

"Rapid reductions in the abundance of these resources will result in unprecedented conflicts that reduce the potential for species co-

existence."he study suggests that conservation focus might need to be reconsidered.

"So far, conservationists have focussed on providing enough food for animals such as birds and bees, such as the important bee-friendly flowers in gardens," Dr Higginson said.

"These results suggest that to save rare species we need more focus on making sure that they have enough places to nest."

He added: "To save bumblebees, people could let part of their garden grow wild between early spring and late summer."

The paper is entitled: "Conflict over non-partitioned resources may explain between-[species](#) differences in declines: The anthropogenic competition hypothesis."

More information: Andrew D. Higginson, Conflict over non-partitioned resources may explain between-species differences in declines: the anthropogenic competition hypothesis, *Behavioral Ecology and Sociobiology* (2017). [DOI: 10.1007/s00265-017-2327-z](https://doi.org/10.1007/s00265-017-2327-z)

Provided by University of Exeter

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