Long-term changes in the abundance and phenology of migrating insects as potential drivers of population change in insectivorous birds and bats

Supervisory team:
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Project description:

Dramatic declines in insect abundance has been shown across continents, but few studies have linked these declines with impacts on higher trophic levels, such as birds and bats. Using the world-class Rothamsted Insect Survey (RIS) data, we will investigate how birds and bats respond to advances in the seasonal timing of insect migrations as well as changes in the distribution and abundance of insects across the UK, by matching RIS data with extensive National Bat Monitoring Programme data and British Trust for Ornithology ringing, nest records and Breeding Bird Survey data to derive impactful 25-year trends.

Field experiments will be conducted to estimate the strength of the spatial relationship between insect migration events and birds and bat activity in order to test whether these groups are increasingly mismatched with their insect prey. We will estimate the role of landscape structure, climate and other abiotic and biotic drivers on these trends.

The project is strongly multidisciplinary, drawing on biology, biophysics and behavioural ecology and has at its core, strong mathematical and statistical components. The Bat Conservation Trust (BCT) and the British Trust for Ornithology are stakeholders in this studentship and with new understanding generated from this research, BCT/BTO will translate findings into meaningful advice for land owners, and promote this advice to policy makers, land owners and farming bodies. The results of the study will also be shared with the Eurobats Intersessional Working Group on Insect Decline as a Threat to Bat Populations in Europe and inform ornithological practice through BTO's KE events.