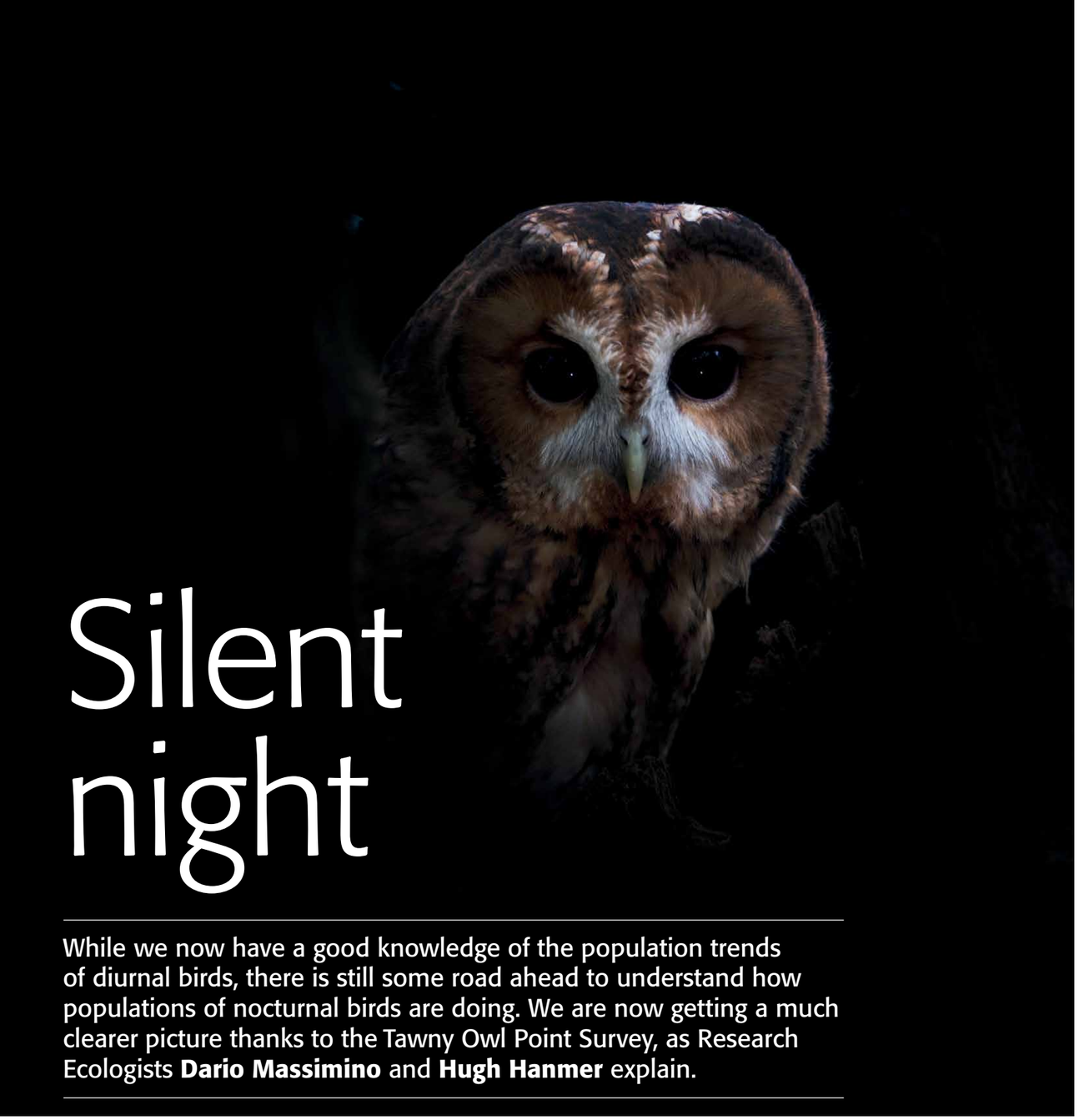


Silent night

While we now have a good knowledge of the population trends of diurnal birds, there is still some road ahead to understand how populations of nocturnal birds are doing. We are now getting a much clearer picture thanks to the Tawny Owl Point Survey, as Research Ecologists Dario Massimino and Hugh Hanmer explain.

Tawny Owls are very well known for the male 'hooting' song and the female 'kew-wick' call, which are commonly heard at night in the British countryside. However, in the day, when most of our fieldwork is done, it is a lot more difficult to determine the presence of this nocturnal species, short of stumbling across a roosting bird or hearing daytime calling. Our excellent Breeding Bird Survey (BBS) volunteers cover around 4,000 1-km squares but only detect Tawny Owls in around 100 of these each year. These data are sufficient to give us an insight into Tawny Owl trends and the latest BBS report reveals a concerning 29% decline over the last 22 years. Although the BBS is not well designed for this nocturnal species, the fact this decrease seems to have been going on for at least two decades has warranted the Tawny Owl to be Amber-listed in the United Kingdom.

The need for a specific survey targeting British Tawny Owls had already emerged in the late 1980s, because there had already been a hint of decline in trends from the Common Birds Census (the old monitoring scheme superseded by the BBS). Two nocturnal surveys were carried out in 1989 and 2005. Given the worrying trend found in the BBS data, BTO prioritised a new Tawny Owl survey as a key component of our wider Project Owl research. The Tawny Owl Point Survey (TOPS) took place in 2018, following the methods used in 1989 and 2005 as far as possible to give the greatest power to detect changes. Over 2,000 surveyors visited 2x2-km squares (tetrads), up to three times during August–October. On each visit the surveyors listened for Tawny Owls during consecutive 10-minute periods and estimated the number of territories detected. Our volunteers did an incredible job at covering almost 3,000 tetrads and making over 6,000 visits, more than in either previous survey!

▲ Tawny Owls were less likely to occupy coniferous woodland in 2018 than in 2005.

DETECTABILITY AND OCCUPANCY

Analysing data from surveys like TOPS requires the use of statistical models that allow us to estimate how many tetrads are effectively occupied by the species of interest. That is necessary because, while we certainly know that there is an owl if we hear one (unless we have misidentified the species), we can never be sure that there is no owl if we don't hear any! By undertaking repeated surveys and looking at the pattern of when we do and don't detect owls, we can estimate the probability of hearing an owl when one is present. Our analyses of TOPS data show that this detection probability is around 51%. This means that we only hear Tawny Owls on about half of our visits to an occupied location. This isn't a failing of observers, rather it is a consequence of how vocally active owls are at the site.

While we certainly know that there is an owl if we hear one, we can never be sure that there is no owl if we don't hear any!

After accounting for detectability, we estimated that, in 1989, 62% of the surveyed tetrads were occupied by Tawny Owls. This percentage, called occupancy rate, was very similar in 2005 (65%) but went down to 53% in 2018. This change was statistically significant, which means that there is enough evidence in the data to confidently say that a real decline in occupancy has occurred. Although we need to keep in mind that these are not direct measurements of population size, we think it is reasonable to assume that the substantial changes in occupancy rates shown by the TOPS analyses must also reflect a change in population size. These findings justify our concerns that the British Tawny Owl population is declining.

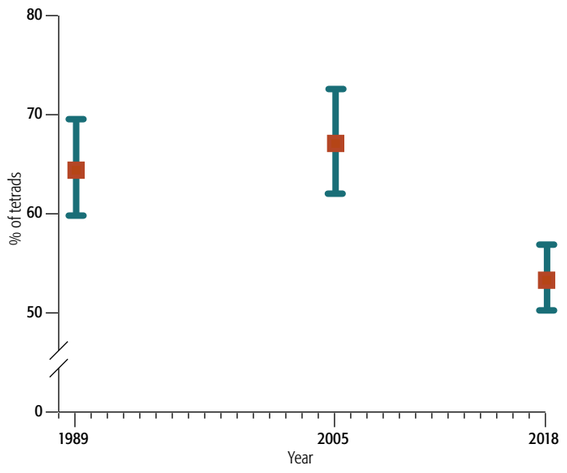
THE NEXT STEPS...

This decline seems to be rather unique to Great Britain, as the species' population appears to be stable in the majority of other countries for which we have reliable abundance data. Investigating the causes of declines is always a fundamental step towards planning conservation actions for stopping and reversing a negative trend. To gain an initial insight into the reasons underlying the apparent declines, we conducted a preliminary analysis of the trends in occupancy rates in different habitat types. The most remarkable result from this initial analysis is that there is no evidence of decline in broadleaf woodland, which is the habitat most preferred by Tawny Owls. In contrast, there was a large decline in occupancy of squares dominated by coniferous woodland between 2005 and 2018. It will be very important to seek further confirmation of these trends which, if upheld, will need proper investigation to understand the underlying processes.

In spite of the preliminary nature of our analyses, we can already see how useful TOPS data can be. We hope that further analysis will bring useful insights into the causes and mechanisms of Tawny Owl declines and help us plan conservation actions for this species to ensure nights in the British countryside do not fall silent. ■

TAWNY OWL TETRAD OCCUPANCY

Percentage of surveyed tetrads which were likely to be occupied by Tawny Owls in 1989, 2005, and 2018. Error bars represent 95% confidence intervals. There is strong evidence for a decline between 2005 and 2018.



TAWNY OWL (MAIN IMAGE) DAVID TIPLING/ALAMY, TAWNY OWL (CUT OUT): JOHN HARDING/BTO

Find out more

Learn more about our Tawny Owl work:
www.bto.org/tops
www.bto.org/tawny-owl
This work was funded by the BTO Owl Appeal.