

IS AVIAN BREEDING SUCCESS WEATHERING THE STORMS?

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Dave Leech and Carl Barimore report on the latest Nest Record Scheme productivity trends and find out how the birds fared during a 2007 breeding season that was characterised by unseasonably heavy rain and flooding.

¿RESISTE LAS TORMENTAS EL ÉXITO REPRODUCTIVO DE LAS AVES?

Dave Leech y Carl Barimore informan sobre las últimas tendencias del programa de monitoreo de nidos y descubren cómo les fue a las aves durante la temporada reproductiva de 2007, caracterizada por fuertes lluvias e inundaciones inusuales.

The three- to five-year population cycle of rodents in the UK hit a peak in 2007, meaning the most successful group of birds were those predating small mammals. Kestrel brood sizes were 14% larger than predicted from long-term trends.

For the second year in a row we appear to have come to the end of a summer that never really felt like it had started in the first place, characterised once more by heavy rain and strong winds. For many Nest Record Scheme (NRS) participants, weather such as this evokes much the same feelings as those experienced by parents whose children have gone to school/summer camp/university for the first time. After all the love and attention invested in finding the nest and following the breeding attempt, every shower brings new fears of catastrophe and premonitions of disaster. We feel compelled to keep checking that the offspring are OK and to interfere if we suspect that things may be about to take a turn for the worse, but we must restrain ourselves and let them fend for themselves. The poor weather in 2007 certainly didn't dampen the enthusiasm of nest recorders, however, and an amazing effort

by all concerned saw submissions top the 35,000 mark for the first time since 1999.

IT NEVER RAINS ...

...but it certainly poured in 2007, with several months achieving the unwelcome status of 'wettest since records began.' In terms of productivity, the most successful group of species were those predating small mammals; the three- to five-year population cycle of rodents in the UK hit a peak in 2007. Brood sizes of Tawny Owl, Barn Owl and Kestrel were 8%, 18% and 14% larger respectively than predicted from long-term trends. Little Owl and Starling were also more successful than might be predicted, both possibly having benefited from increased accessibility to soil invertebrates, on which they primarily feed, in the wet weather conditions. Nuthatch also demonstrated above-average breeding success – researchers in Europe have previously identified a counter-intuitive positive correlation between the breeding success of this species and spring rainfall, although the reason for this relationship remains unclear.

In contrast, many resident open-nesting species showed levels of productivity that were

FIG 1. NEST RECORD SCHEME CONCERN LIST

| SPECIES | YEARS ON LIST | SIGNIFICANT DECLINE IN: | BREEDING POPULATION TREND |
|------------------------|---------------|--|---------------------------|
| Kestrel (A) | 3 | Brood size | >25% decline |
| Moorhen | 16 | Clutch size, Nest survival (E) | Fluctuating |
| Ringed Plover (A) | 12 | Nest survival (E) | Uncertain |
| Lapwing (R) | 2 | Nest survival (E) | >25% decline |
| Nightjar (R) | 2 | Clutch size*, Brood size*, Nest survival (E)* | Uncertain |
| Tree Pipit (R) | 3 | Nest survival (E & C)* | >50% decline |
| Yellow Wagtail (R) | 9 | Brood size* | >50% decline |
| Grey Wagtail (A) | 6 | Clutch size, Brood size | Probable decline |
| Pied Wagtail | 5 | Clutch size, Brood size | Uncertain |
| Dunnock (A) | 6 | Nest survival (E) | >25% decline |
| Whinchat (A) | 3 | Nest survival (E & C)* | Probable decline |
| Willow Warbler (A) | 10 | Nest survival (E) | >50% decline |
| Spotted Flycatcher (R) | 4 | Clutch size, Brood size, Nest survival (E & C) | >50% decline |
| House Sparrow (R) | 5 | Brood size | >50% decline |
| Linnet (R) | 17 | Clutch size, Brood size, Nest survival (C) | >50% decline |
| Bullfinch (A) | 3 | Brood size, Nest survival (E & C) | >50% decline |
| Yellowhammer (R) | 6 | Clutch size, Brood size, Nest survival (E & C) | >50% decline |
| Reed Bunting (A) | 17 | Nest survival (E) | >50% decline |
| Corn Bunting (R) | 3 | Brood size*, Nest survival (C)* | >50% decline |

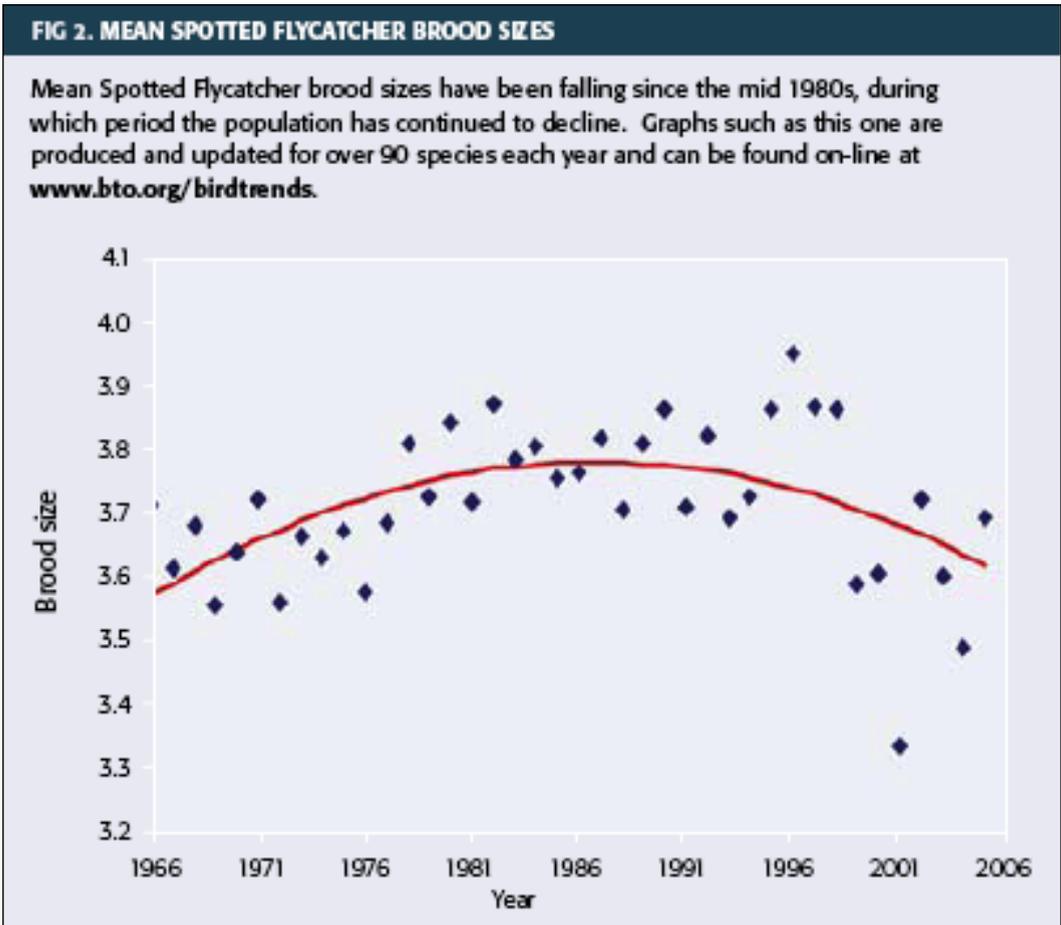
E indicates nest survival at the egg stage. C indicates nest survival at the chick stage. * indicates that the average annual sample size is small (between 10 and 30 records per year). Breeding population trends are taken from www.bto.org/birdtrends. The inclusion of each species on the Red and Amber Lists of Conservation Concern is indicated by R or A, respectively (see www.bto.org/psob).

lower than predictions made using data from previous years. Robin, Dunnock and Wren, appeared to be particularly badly affected, exhibiting reduced clutch and brood sizes and increased failure rates, as did Reed Warbler. It is interesting to note that ringers participating in the Constant Effort Site scheme (CES, www.bto.org/goto/cesnews.htm) also reported lower proportions of juveniles of these species in their catches in 2007. CES and NRS results were not in agreement across the board. Nest recorders found little evidence for the reduction in productivity of Blue Tit and Great Tit apparent from the former data set. This discrepancy suggests that weather conditions may also have influenced post-fledging survival and

illustrates the importance of combining a range of techniques when investigating trends in avian demography.

THE IMPORTANCE OF BEING TREND-Y

While the annual fluctuations in breeding success provide a fascinating insight into the processes that determine the number of offspring that birds are able to produce, it is the long-term trends in productivity that are of greatest use to conservationists. The NRS Concern List highlights those species that have demonstrated recent declines in both abundance and some aspect of productivity (Fig 1). While no new species have been added as a result of the latest analyses, a recent increase in mean brood sizes



has led to the removal of Starling, leaving a revised total of 19. The species of greatest concern are Yellowhammer and Spotted Flycatcher, which currently exhibit statistically significant declines in all four breeding parameters derived from the NRS data set

(clutch size, brood size, egg survival rates and nestling survival rates) (Fig 1). The trends for Linnet, Bullfinch and Nightjar are also worrying, with three of the four breeding parameters calculated for each species indicating a significant reduction in productivity. Equivalent

NRS DATA ANALYSIS

- NRS data for 94 species were analysed using the methods outlined in a recent review paper in *Bird Study* 50:254–270. Trends in laying date, clutch and brood sizes, and in daily nest failure rates over the egg and chick periods are described by linear or quadratic regression, as appropriate. Trends were not calculated for those species having a mean annual sample size of fewer than 10 records and species with a mean annual sample size of between 10 and 30 records were given the caveat of ‘small sample size.’
- Species are placed on the NRS Concern List (Fig. 1) if a) they demonstrate significant declines in some aspect of breeding performance over at least the last 15 years and b) they have been placed on the Red or Amber Birds of conservation concern list due to population declines or if there is some uncertainty over their population status.

trends are calculated for over 90 species and published on-line each year in the Breeding Birds in the Wider Countryside Report – take a look at the latest results at www.bto.org/birdtrends.

LOOKING TO THE FUTURE

We're keen to receive more records of all species, as long as you are able to count the eggs and/or chicks inside the nest. So whether it's a Blackbird or Robin in your garden, or a Moorhen in your local park, why not help us to help them by filling in a nest record.

It simply wouldn't be possible for us to

produce this article, without the amazing contribution of our dedicated volunteers. There are currently over 500 nest recorders in the UK, but there is always plenty of room for more, so please phone us or e-mail nest.records@bto.org if you 'd like to join in.

We are also extremely grateful for the support given under the JNCC/BTO partnership that the JNCC undertakes on behalf of Natural England, Scottish Natural Heritage, Countryside Council for Wales and the Environment and Heritage Service in Northern Ireland.