

## Getting more out of Ringing and Nest Recording

### *Background*

Ringing in Britain and Ireland began more than 100 years ago now, yet it continues to yield important information for conservation, scientific and other purposes. The value of ringing in working out patterns of bird movements over this period is amply demonstrated by the *Migration Atlas*. Although in the coming years we can expect electronic tags (be they satellite, GPS or geolocator) to revolutionise our understanding of where birds go and how they get there, **a key aim of ringing and nest recording should be to monitor the health of our bird populations.**



Specifically, we want to develop the ability of the ringing and nest recording schemes to provide survival and breeding success figures, so we can advise and inform conservation agencies and others. We need to be able to do this for as wide a range of species as possible. BTO's enviable reputation for high quality, impartial science is based, in large part, on the efforts of the many who contribute to its schemes. So, the aim of this discussion is think about how we can get the most out of our ringing and nest recording to make best use of the data collected.

### *What is our aim?*

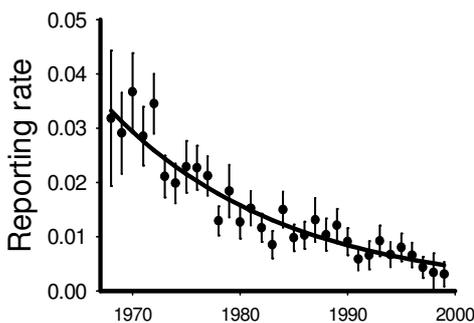
A core part of what BTO does is monitor changes in the number of birds over time. Each year we publish these population trends for a wide range of species on [www.bto.org/birdtrends](http://www.bto.org/birdtrends), using data from BBS and other surveys. **Our goal is to provide comparative trends in survival and breeding success, the underlying drivers of population change, alongside these population figures.** In any given year, the size of a population is determined by the number of young produced, the proportion of those that survive to breed and the number of adult birds that survive from the previous year. Data collected by ringers and nest recorders allow us to produce estimates of productivity and survival, the first step in determining the mechanisms that are responsible for population declines, or indeed increases, and ultimately in developing our understanding of the environmental pressures causing changes in abundance. This approach has already made a vital contribution to our understanding of why farmland birds declined, for example, and has aided their conservation by helping shape options for the Environmental Stewardship scheme.

The ringing and nest record schemes already provide lots of useful data, but by working with ringers and nest recorders to develop our approach to targeting, we hope to improve the quality of the information we produce. **In doing this we need to make our data relevant to the needs of conservation organizations,** particularly JNCC and the statutory agencies (CCW, NE and SNH) who provide the financial support that underpins our schemes. We would like to be able to extend the range of species for which we can diagnose causes of population changes, and hopefully get a heads-up of future problems as they emerge. Consequently, we are trying to identify those species that might benefit from a boost in effort. We currently get enough data to undertake good analyses for Blue Tit and Blackbird for instance, but not quite enough for, say, Dipper or Yellowhammer. Can we collect enough data to be able to give robust advice on these species too? Of course, we also need to recognise there are species for which we are unlikely ever to be able to collect enough data, simply because they are too scarce, or too difficult to catch or find nests in sufficient numbers. We should also try to identify species that occur in a range of habitats and have a variety of ecologies; after all, we don't know which species will be the next House Sparrow.

What do we need to do to achieve this?

### Ringing

Although analytical techniques have become more powerful and will continue to improve, there are some basic requirements of the raw data which mean that we cannot use all ringing records in these analyses. **For most species, we can only use data collected from birds ringed during the breeding season** as we must ensure that survival, productivity and population estimates come from the British breeding population. Ringing birds on passage, or during the winter, is likely to be less useful in this regard as, except for a few highly sedentary species, we cannot identify which population they come from. Individuals that breed elsewhere will be subject to different environments and ecological factors, complicating analyses of population trends. The second key consideration is that we also need to account for variation in the likelihood that individuals are re-caught, or found dead. Given these constraints, what can we do to increase the proportion of ringing data that can be used in these analyses?



To estimate survival rates we clearly need to re-encounter birds after we have ringed them. This could be either by re-trapping them, or by their being found dead. Of course, we don't find all the birds we ring again, so **we have to take into account the probability that a bird will be re-encountered; in the case of re-traps, this will clearly depend on the effort we put in.** There are ways to allow for this - Program MARK, for example, will calculate estimates of both survival and recapture probabilities. Similar thinking applies to estimating survival rates from birds found dead, but

here we have to estimate the probability that a ringed bird is found and then reported back to BTO HQ. Unfortunately, the likelihood of this has decreased massively over the years - whereas in the 1970s for every 100 Song Thrushes ringed, we would receive a report subsequently of around 3 birds found dead, now we have to ring around 2,000 birds to get a similar number of recovery reports (see graph).

Generally, then, we are much more likely to recapture a bird than to find it dead, so **we are increasingly reliant on recapture studies, primarily CES and RAS, to estimate survival rates.** If capture effort varies a lot then it will be much harder to discern how much survival rates change between years. The benefit of CES and RAS is that the amount of effort put in should be reasonably consistent between years, so most of the variation in number of birds caught will relate to differences in survival. Working out ways in which the amount of effort put into ringing more generally might be measured is a bit more difficult but this could allow us to make more use of general retrap data and we are thinking about ways in which this might be done.

### Nest Recording

Although data collected by nest recorders have identified changes in clutch size over time as birds nest earlier in response to warmer springs, in general, the year to year variation in the number of eggs is relatively small. **The most important factor determining variation in breeding success between years is the extent to which nests fail,** be it through predation, poor weather or lack of food. Measuring failure rates requires that multiple visits are made to individual nests. If we only visit nests late on then we risk overestimating nesting success, because we only visit nests that have successfully



reached that stage and miss the nests that have failed early on, when they are perhaps more vulnerable. There is an understandable concern over the safety of multiple visits to nests, but there is extensive evidence from scientific studies showing that, if due care is taken, monitoring should not influence the outcome of a nesting attempt for the majority of non-colonial species. We shall be developing the NRS website to provide more information about the results of these studies and more detailed monitoring guidelines, highlighting those species or locations for which additional care must be taken.

*The next steps...*

Ringling Committee discussed these ideas in principle at their October meeting (see their minutes on the website). During the course of the year they will be continuing these discussions, considering how these goals might be achieved practically. This will include discussion of ring refunds and subsidies – how might we best use the limited amount of money we have? For example, should we continue the species based approach, or perhaps move to providing grants for equipment or contribute towards project-related expenses? They will also be refining the proposed list of priority species. It is worth noting that Britain holds internationally important numbers of seabirds and wintering waterfowl. The processes for measuring and understanding population change are slightly different to those of our breeding birds, not least because they occur here in winter (waterfowl) or in geographically remote areas (many seabirds). For this reason, these are being considered separately in a parallel process, but they will nevertheless form a key part of the overall strategy which we hope to have in place by early 2012.

We recently held a successful workshop for ringers at the Swanwick Conference which aired many of the issues outlined here. Now we would like to seek views from those who weren't at Swanwick. Send me an email ([rob.robinson@bto.org](mailto:rob.robinson@bto.org)) or talk to your local Ringing Committee member and let us know what you think.

**Rob Robinson, March 2010**