Bird Populations 8:206-209
Reprinted with permission
BTO News 265:10-11
© British Trust for Ornithology 2006

RAS COMES OF AGE

ROB ROBINSON, STUART NEWSON AND JOHN MARCHANT
British Trust for Ornithology
The National Centre for Ornithology
The Nunnery, Thetford
Norfolk, IP24 2PU, United Kingdom

For several years now, many BTO ringers have been assiduously catching adult birds each summer to gather data on annual survival rates. Now, thanks to all their hard work, we are in a position to produce estimates of annual survival for a number of species. *Rob Robinson, Stuart Newson* and *John Marchant* report.

EL PROGRAMA RAS ALCANZA LA MADUREZ

Durante varios años ya, numerosos anilladores del BTO han estado capturando asiduamente adultos en la temporada de cría para recopilar datos sobre tasas de sobrevivencia. Ahora, gracias a sus esfuerzos, podemos generar estimas de sobrevivencia anual para varias especies. *Rob Robinson, Stuart Newson* y *John Marchant* informan.

Populations usually change in size for one of two reasons: there has been a change in either the productivity of breeders, or their survival rates. Recent analyses of data gathered by BTO volunteers show that the importance of each of these differs between species, depending on its particular ecology. One of the great strengths of BTO data is that, through our various schemes, we can monitor changes in both productivity and survival on a more or less annual basis. In this article, we present some of the first results from Retrapping Adults for Survival (RAS), one of our newest monitoring schemes.

Through the RAS scheme, licensed ringers are encouraged to focus their efforts on collecting data that can be used to monitor the survival rates of breeding birds. In a series of independent RAS projects, ringers concentrate on a particular species within a defined area, which might be a collection of farms, or an area of woodland. Each breeding season, the project attempts to record every breeding adult within the study area as an individual — by ringing it or by noting a ring or colour rings placed earlier. The turnover of breeding adults between seasons measures survival rates, site by site, in a way that is not possible through general ringing. The procedures for estimating annual rates are quite datahungry — that is they require information about a lot of birds, over a number of years in order to produce reliable estimates of survival.

Although RAS was started in 1998, many people were, in effect, running RAStype studies already, and they have kindly submitted their data from previous years, greatly increasing the value of their project. In one case, data stretch as far back as 1968, pre-dating RAS by 30 years!

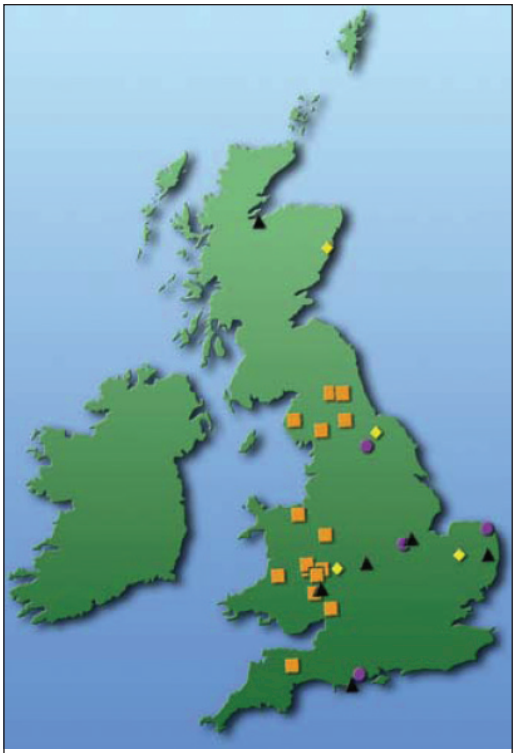
RAS is especially useful for species that are not caught as part of other programmes, particularly the Constant Effort Sites (CES) scheme. The species for which we are most keen to get RAS studies going are listed in the box below — some of these will certainly be more challenging than others! Ideally, we would like to see at least five studies for each of these

species, spread throughout their range, so we can gauge whether regional differences are likely to be important. So far, the species inspiring the most projects have been Pied Flycatcher, Sand Martin, Swallow and House Sparrow.

PIED FLYCATCHERS

First, we looked at survival rates in Pied Flycatcher, which is one of the most popular species for RAS. We were able to update the analysis that we ran a few years ago. Because there are so many sites (more than 15), some with data going back to 1980 or even earlier, the analysis represented a real challenge for our computers. Locations of these projects are mapped in Figure 1.

The average adult survival rate over all sites is shown in Figure 2. There does not seem to have been much change overall; since 1980, annual survival has remained at around 35–40%, which is about what would have been expected from other, mostly Scandinavian studies. Most of the individual sites are correlated with this overall trend, although on three sites the pattern of survival appears to differ somewhat. Perhaps unexpectedly, geographically close sites, except those in northeast England, do not seem to show especially similar patterns between years. This may indicate that other factors, such as habitat type, are often more important than region.



RAS projects that contributed to the analyses reported here: black triangle = Sand Martin; yellow diamond = Swallow; purple circle = House Martin; orange square = Pied Flycatcher. These are a small subset of around 100 projects currently active across Britain & Ireland.

FIGURE 1. Locations of RAS projects.

HIRUNDINES

We also looked at adult survival rates in the three hirundine species: Sand Martin, House Martin and Swallow. Sand Martin is the second most popular species for RAS projects, and capture totals can be well into treble figures each year. Although we have fewer sites for the other two species, and each site tends to catch fewer birds, we can estimate survival rate reasonably well for these too (Figure 3). Average survival rates over the whole period are broadly similar to those in Pied Flycatcher, probably because all four are trans-Saharan migrants (we might expect annual survival rates of resident birds to be around 50–60%). The estimate for House Martins, averaging 28% over all years, does seem to be rather lower, however. This might be a real difference in survival, or an indication that House Martins are less site-faithful than the other species – our methods cannot distinguish between deaths and permanent emigration from a site, since in neither case will a bird be recaptured.

Only for Sand Martin do we have enough historical data to calculate reliable estimates of survival before 1998. Since then, however, the patterns of survival rate between years for each of the three species have been remarkably similar (Figure 3). This is perhaps surprising, given that they winter in different areas, but on the other hand all hirundines do share a generally very similar ecology. Initial results suggest that these changes in survival are not related to rainfall in the Sahel region, as has been reported for example for UK Sedge Warblers, Hungarian Sand Martins, and Dutch Purple Herons. Interestingly, the annual changes

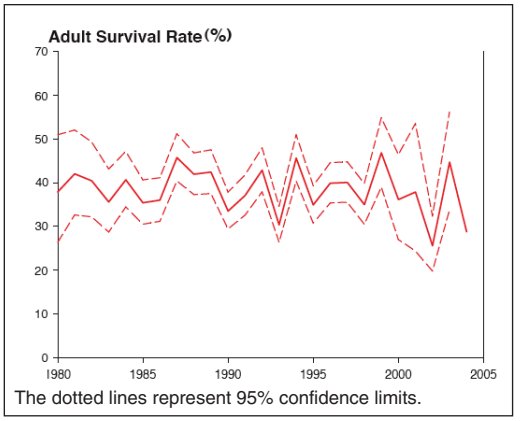


FIGURE 2. Adult survival rates of Pied Flycatcher from RAS studies.

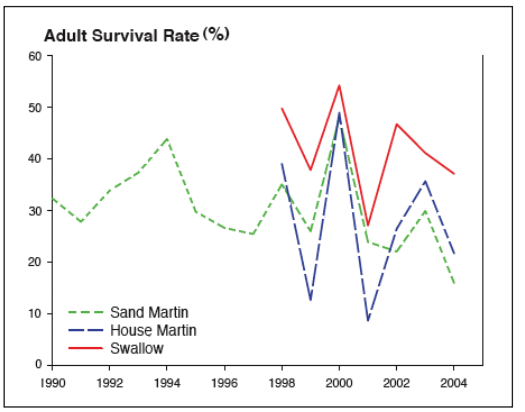


FIGURE 3. Adult survival rates of hirundines from RAS studies.

in survival rates of hirundines and Pied Flycatcher do not seem to follow a similar pattern, which also suggests that mortality on migration may be relatively less important. These results will clearly repay further analysis.

Recent comprehensive assessments of the population status of woodland birds in Britain, and of birds more generally across Europe, have highlighted the finding that many long-distance migrant birds have declined markedly. The Wider Countryside Report www.bto.org/birdtrends suggests that Pied Flycatcher and Sand Martin have undergone declines in the last ten years, while Sand Martin experienced a big decline in the late 1980s and early 1990s and Swallow numbers, though variable between years, have experienced no overall trend. On the basis of these results, the decline in numbers of Pied Flycatcher does not appear to be related to changes in survival, and nor do the changes in the two martin species, though we do not really have a long enough time series to say this with much confidence.

There is good evidence, however, that Pied Flycatchers may be responding adversely to climate change. The timing of peak caterpillar abundance is occurring earlier each year, as spring temperatures increase, and birds are not able to adjust their laying schedules accordingly, meaning there is a shortage of food for the chicks when they hatch. In the latest development to a long-running study of Pied Flycatchers and caterpillars at nine sites in the Netherlands, Christian Both and colleagues have recently reported (*Nature*, May 2006) that population decline has occurred mostly at those sites where the peak of caterpillar abundance has advanced markedly and where breeding attempts are most mistimed. A decline in productivity, rather than survival, may be the key to population change, therefore.

If you are a ringer and would like a challenging but rewarding project, and think you could catch enough breeding adults of any of the species listed in the Box to generate at least 25 retraps each year within a study area then contact the RAS organiser (ras@bto.org) for more details.

We would like to thank all those who have taken part in RAS so far for all their efforts, particularly those whose studies we have used in these analyses, including David Boddington, whose Pied Flycatcher study dates back to 1968.

TARGET SPECIES FOR RAS

New RAS projects for the following species would be especially welcome (number of projects known to be active in 2005 in brackets).

- Seabirds: Eider (4), Manx Shearwater (1), Kittiwake (1), Common and Arctic Terns (0)
- Waders: Ringed Plover (1), Common Sandpiper (2) and Oystercatcher (0)
- Hirundines: Sand Martin (15), House Martin (3), Swallow (6)
- Open-ground nesters: Whinchat (0), Stonechat (1), Wheatear (2)
- Finches & sparrows: House Sparrow (4), Tree Sparrow (0), Chaffi nch (3), Linnet (0)
- Hole-nesters: Starling (1), Pied Flycatcher (17)
- Other species: Dipper (2), Ring Ouzel (0).