The BTO Magazine for Ringers and Nest Recorders

LIFECYCLE

AUTUMN 2016 ■ ISSUE 4

MONITORING TAWNY OWLS ■ SURVIVAL MODELLING ■ TAGGING NIGHTINGALES

WADER RINGING

Mist-netting waders on inland waterbodies

BTO
Looking out for birds

Editorial

ISSUE 4 AUTUMN 2016

Welcome to the autumn edition of *Life Cycle*. The world around us has been quietening down over the past few weeks as the 2016 breeding season comes to an end and our migrant summer visitors leave for their wintering grounds. One such visitor is the Nightingale, which is not only disappearing for the year but, more worryingly, as a British breeding bird. This newly red-listed species is the focus of some intensive ringing studies, as described in the article on page 7. Another species now featuring among the *Birds of Conservation Concern* is the recently amber-listed Tawny Owl. On page 12, we have brought together the knowledge of some of the most experienced Tawny Owl fieldworkers to provide a guide to setting up a project and monitoring this fascinating species.

In the second of the two-part series on mist-netting waders, the focus of the article on page 20 shifts to catching on inland waterbodies. As our fabulous cover image suggests, this includes a guide to catching Common Sandpipers. And if ducks are more your thing, head to page 4 to learn how they are coping with climate change and how to build a simple trap to help gather much-needed data. As NRS, CES and RAS submissions start to come in, we provide a practical example of how your NRS data are helping to steer conservation policy (page 11) and offer guidance on determining the optimum survey period for a successful RAS study (page 16).

As ever, your feedback or ideas for content would be welcomed and if you would like to share your experiences and expertise by writing or contributing to a future article, we would also love to hear from you. Finally, thank you to the incredible army of volunteers who spend so much time collecting data; without you, none of this would be possible. We look forward to seeing and chatting to many of you at the Scottish Ringers' and Swanwick conferences.

Ruth Walker & Carl Barimore

IN THIS ISSUE . . .

LIFECYCLE

THE BTO MAGAZINE FOR RINGERS AND NEST RECORDERS

The Ringing and Nest Record Schemes are funded by a partnership of the BTO and the JNCC on behalf of the statutory nature conservation bodies (Natural England, Natural Resources Wales, Scottish Natural Heritage and the Department of Agriculture, Environment and Rural Affairs, Northern Ireland). Ringing is also funded by The National Parks and Wildlife Service (Ireland) and the ringers themselves. The BTO supports ringing and nest recording for scientific purposes and is licensed by the statutory nature conservation bodies to permit bird ringing and some aspects of nest recording. All activities described are undertaken with appropriate licences and following codes of conduct designed to ensure the welfare of birds and their nests are not adversely affected.

CONTACT US

The British Trust for Ornithology is a charity dedicated to researching birds. For membership details please contact: membership@bto.org

British Trust for Ornithology, The Nunnery, Thetford, Norfolk IP24 2PU
Tel: (01842) 750050
Website: www.bto.org
Email: ringing@bto.org, nrs@bto.org, ces@bto.org, ras@bto.org

Registered Charity No 216652 (England & Wales)
No SC039193 (Scotland)

LIFE CYCLE PRODUCTION

Life Cycle is the biannual magazine of the BTO Ringing and Nest Record schemes. It is freely available on the BTO website.

Articles in *Life Cycle* are written by ringers and nest recorders, so please send ideas and contributions to the editors:
Carl Barimore, NRS Organiser
Email: nrs@bto.org
Ruth Walker, Ringing Surveys Organiser
Email: ruth.walker@bto.org

Editors:
Carl Barimore, Ruth Walker, Jacquie Clark & Dave Leech.

Layout, design, imagesetting and typesetting:
Jane Waters & Mike Toms.

Printing:
Swallowtail Print, Norwich.

Copy dates:
Spring edition – 31 December
Autumn edition – 30 June

Thanks to the proof readers for all their efforts.
Cover image: Common Sandpiper, by B. S. Bates

NEWS FROM RINGING & NEST RECORDING

2017 RINGING PERMIT RENEWALS

The 2017 permit renewal process is now underway (see **www.bto.org/ringing-permit-renewals** for details). The online renewals were a great success last year but to improve this further, please only use the online renewal link that has been sent to you (as they are unique), and take care with the health and wildlife crime questions; most of those who ticked 'yes' to having unspent convictions or being unfit to continue ringing last year were found to have done so in error when staff followed these up.

Please note that no permit can be issued or validated until payment has been made. If you have not renewed your permit by May 2017, or informed the office you wish to resign, your permit will be lapsed. If you do not receive renewal information for 2017, or get your permit after you think you have renewed, please get in touch.

SCHEDULE 1 AND SPECIAL METHODS

Reporting and renewal instructions for special methods endorsements and Schedule 1 permits will be sent out in October. We cannot renew your ringing permit until reports for **all** special methods endorsements have been submitted and accepted.

Forms and guidance for the Schedule 1 permitting process in all countries across Britain & Ireland can be found at **www.bto.org/volunteer-surveys/ringing/taking-part/protected-birds**. Schedule 1 permits are **not** renewed automatically, we need both an annual application/renewal and a report before your permit can be renewed. The preferred reporting method is via the Nest Record Scheme (NRS) and guidance on completing nest records for this purpose is given at **www.bto.org/volunteer-surveys/ringing/taking-part/nrs-sch1-help**. For raptors in Scotland, please make your returns via the Scottish Raptor Monitoring Scheme on the standard reporting spreadsheet (**http://raptormonitoring.org/srms-data/want-to-contribute-data-to-the-srms**).

Sparrow Hybrid, by Jim Connell

Presumed Spanish x Tree Sparrow hybrid at Gibraltar Point in March 2012.

Schedule 1 licences for activities other than nest monitoring, including ringing, can still be reported using the standard return forms but data from sources other than NRS cannot be incorporated into annual productivity summaries produced by BTO. Please submit your renewal and report (regardless of method used) at the same time; the earlier you do this the faster you will receive your renewal for the following breeding season.

SPARROW HYBRIDS

Known for his wide-ranging studies into the sparrow family since before the publication of his first monograph, *The House Sparrow*, in 1963, Denis Summers-Smith has been asking the question for many years: do we have evidence of Spanish Sparrow breeding in the UK?

The first European report of a Spanish Sparrow north of its Mediterranean breeding range was on Lundy Island in 1966 and there have since been a further 26, including 10 accepted British sightings. All these have been male – perhaps unsurprisingly given the female is much harder to tell from House Sparrow – and there have been no reports of suspected breeding activity.

However, since sparrow hybridisation is well documented and House Sparrow x Spanish Sparrow hybrids have been noted in the latter's regular breeding range, Denis has been examining reports of suspected Spanish Sparrow hybrids in the UK to see whether these could provide evidence of local breeding. Using a criterion whereby individuals display at least two distinct characteristics of each parent species, since 1994 Denis has identified four potential hybrids with House Sparrow and five with Tree Sparrow.

As Denis continues these investigations, he would be very keen to speak to ringers and nest recorders, especially those monitoring sparrow colonies, about keeping an eye out for suspect birds. If you'd like to contact Denis, email him at **jdss1@sky.com**.

VOLUNTARY OPPORTUNITY

A voluntary field assistant is required to assist with an ongoing PhD project (in collaboration with the BTO), exploring breeding performance of Blue and Great Tits in nest boxes throughout Durham University woodlands. Tasks will include nest-box monitoring, adult and pullus ringing, invertebrate and habitat surveys. Details at: **www.conservationecology.org/opportunities**

Teal, by Jill Pakenham/BTO

Although WeBS counts show that the number of Teal wintering in the UK has increased steadily since the mid-1960s, the mean number ringed each year has reduced considerably over the same period.

Not ducking the climate-change issue

Climate change is here to stay, bringing milder winters but more extreme storms and precipitation. Tony Fox asks how this might affect our wildfowl. The number of ducks ringed in Britain & Ireland has fallen considerably over the last few decades so, do we have sufficient data to answer Tony's question and what can ringers do to help?

DIVERS…

The most obvious responses to temperature change displayed by wildfowl are the recent shifts in wintering ranges of diving ducks. Unlike dabbling ducks, these species can feed as long as water bodies and rivers remain ice free, happily foraging in sub-zero air temperatures. Analysis of the midwinter counts from the International Waterbird Census (collated globally by Wetlands International) has shown that Tufted Duck, Goldeneye, Goosander and Smew have increased spectacularly in Finland, Sweden and Denmark, by a staggering 24,800% in the case of Finnish Tufted Duck. Meanwhile, wintering populations in the former core areas of Ireland, Britain, the Netherlands, Germany and Switzerland have declined by up to 66%, the biggest reduction relating to Goosander in the Netherlands (Lehikoinen et al. 2013, Pavón-Jordán et al. 2015). In the last 30 years, these birds have shifted the centre of gravity of their wintering ranges northwards and eastwards towards their breeding grounds following a 3.8°C increase in early winter temperatures.

Mean ringing totals per decade and for the past six years (note the most recent figure is inflated by the very cold winter of 2010).

	1960s	1970s	1980s	1990s	2000s	2010-15
Wigeon	160	326	426	779	897	452
Gadwall	26	117	214	203	192	118
Teal	2,142	1,251	981	1,647	1,897	802
Mallard	4,789	3,708	2,968	1,743	1,474	1,263
Pintail	152	249	101	95	175	75
Shoveler	62	82	58	34	17	18
Pochard	31	192	603	607	139	64
Tufted Duck	216	708	1,322	863	423	474

…AND DABBLERS

Dabbling ducks are demonstrating less dramatic distributional deviations than diving ducks. Although numbers of wintering Wigeon have increased in Sweden and Denmark, and fewer are now to be found in Ireland and the Iberian Peninsula, there has not been any major change in their centre of gravity (Fox et al. 2016). The species' population trend has been more dynamic, however. Following a long period of slow growth in northwest Europe, numbers gradually stabilised and, since the mid-2000s, have begun to decline (Fox et al. 2016). Annual counts are correlated with

changes in reproductive success, as measured via age ratios calculated from Wigeon wing samples collected by Danish hunters under an extremely useful voluntary scheme (Christensen & Fox 2014).

Declines in overall population size are closely linked to the long-term decreases in duckling production, especially in recent years. Again, climate appears to be the culprit. The proportions of young recorded in the field and hunters' bags were correlated with the North Atlantic Oscillation, a large-scale climate phenomenon that determines weather patterns across much of Europe. Duckling production was lower in cooler, unsettled summers, the likes of which are predicted to occur with increasing frequency.

INTO THE UNKNOWN

While the ability to identify causes of change in these species all sounds very impressive, the studies above represent the exception, not the rule, and major knowledge gaps exist for even our commonest species. Lack of data hampers our ability to monitor changes in survival, and therefore assess the impact of shooting in Europe, while also limiting our understanding of flyway structure and the links between breeding, staging, moulting and wintering areas.

And it's not just ringing that's important – it's vital that we maintain our international count networks to enable effective protection of key sites along the flyway as distributions change, as well as keeping an eye on changes in overall population size. So, please, keep contributing your duck counts to the WeBS scheme and if you are a ringer who might be interested in catching ducks, please give it a go!

CATCHING DUCKS

Large, static duck traps can be very effective on bigger water bodies but catches can be taken using smaller, temporary structures. The Benning duck trap is one such design, comprising three sides and a roof, plus two curved sections that form an entrance funnel. The trap should be placed in shallow water amongst emergent vegetation and a line of wire mesh placed perpendicular to the funnel to help lead ducks into the entrance.

The shape and dimensions of the trap are not important; it is the width of the entry funnel that is crucial. Ducks should be able to squeeze gently through the flexible opening but the wire must then spring back into shape, producing a narrow exit that they are unable to use. Entrance size is clearly dependent on the species concerned and may require trial and error to determine. If the cage is made of robust rectangular wire mesh and well fixed with cable ties and bamboo canes, no base is required; this makes the whole arrangement much easier for one person to move. A more robust version can be made using a light timber frame. To allow access for ringing, cut a suitable panel in the mesh, secure the top edge with cable ties as hinges and fasten shut with string; the captured birds can then be removed with a hand net.

Bait should be placed outside the trap, in the funnel and inside the cage. Use cracked grain (wheat/barley), rape seed (brilliant for Teal) or 'tailings', the weed seeds filtered from grain after the harvest. It can take ducks a few days to find the bait and trap, so patience may be required! Catching seems most successful overnight and at dawn so the trap should be set, well baited, in the evening, left overnight and visited again at first light; as these traps are relatively small, they should never be left unchecked for periods of greater than 12 hours and should always contain sufficient food for the maximum potential catch over this period. Avoid setting traps when ducklings are small to prevent splitting of family groups.

References

Christensen & Fox (2014) Changes in age- and sex-ratios amongst samples of hunter-shot wings from common duck species in Denmark 1982–2010. *European Journal of Wildlife Research* **60**: 303–312.

Fox et al. (2016) Seeking explanations for recent changes in abundance of wintering Eurasian Wigeon *Anas penelope* in northwest Europe. *Ornis Fennici* **93**: 12–25.

Lehikoinen et al. (2013) Rapid climate driven shifts in wintering distributions of three common waterbird species. *Global Change Biology* **19**: 2071–2081.

Pavón-Jordán et al. (2015) Climate-driven changes in winter abundance of a migratory waterbird in relation to EU protected areas. *Diversity and Distributions* **25**: 571–582.

The design for this trap can be found in the *Trapping Guide* on the ringers-only web pages.

Benning duck trap, by Tony Fox

Wilde about bird observatories

As Findlay Wilde says, 'Spurn is a wonderful, wild place with the North Sea on one side and the Humber Estuary on the other; a magnet for migratory birds and a haven for birders. It is fantastic that the BTO support the observatory through the Martin Garner Spurn Young Birder competition, offering a fantastic learning opportunity and great experience for under 16s. I've been lucky enough to visit Spurn twice and hope to stay there soon, especially after hearing all about the experiences other young birders, such as Georgia Locock, have had there.' Here Georgia shares her thoughts and impressions of volunteering at Spurn.

Spurn, by Georgia Locock

At Spurn, which is one of 19 accredited bird observatories in Britain & Ireland, you find yourself standing on a long thing piece of land, which is a magnet for migratory birds.

GEORGIA'S EXPERIENCE

Spurn National Nature Reserve was the first Bird Observatory I visited and upon arrival, after four train changes, a bus and a lift, I was quite nervous. I didn't need to be, though. By the end of my first day, I'd been inspired by the magical place that it is.

My first visit last year, which was supported by the BTO's Young Bird Observatory Volunteer Fund (YBOVF), was straight after my last GCSE exam (I needed the retreat!) around the end of June. This was just in time for peak Swift migration, but I certainly didn't expect to see the numbers I did. On my last day, which had the biggest passage, we counted almost 4,000 birds swirling over. Not only was this an absolute delight but it felt brilliant to help with this very important survey, especially as Swift numbers are in decline.

Monitoring of bird populations and migration is a fundamental role of Bird Observatories across Britain & Ireland, achieved through counts and ringing. Although I'm not a ringer myself, I certainly wasn't short of opportunities to get stuck in to the scientific study of birds for the first time.

Upon my latest trip at the end of July (yes, I've been back – I can't keep away now!) it wasn't just counts I helped with, but also the Little Tern breeding project at Spurn. As Little Terns are vulnerable ground-nesting birds, the project involves wardens monitoring them around the clock.

Spending my afternoons sitting with views of the sea, waders and Arctic, Sandwich, Common and, of course, Little Terns was bliss. The scenery, birds, wilderness, beauty and people of Spurn have all inspired me, and I really can't express the value of it for deepening my interest and further firing my enthusiasm for the importance of conservation science.

The YBOVF has now supported two stays at Spurn and has been a huge benefit to me.

Fair Isle Bird Observatory, by Nick Moran

The Young Bird Observatory Volunteer Fund

The Young Bird Observatory Volunteer Fund supports young people wanting to visit accredited British & Irish Bird Observatories by providing grants of up to £200. Priority is given to those aged under 21 who are able to fully engage with fieldwork and general observatory activities. Applications for the fund will be open again in February 2017. For more information, visit: **www.bto.org/young-fund**

Links to all the registered Bird Observatories can be found at **www.bto.org/volunteer-surveys/ringing/about-ringing/useful-links**

Nightingale, by Nick Clayton

Nightingale numbers have declined in England by c. 90% over the last 40 years due to range contraction and reduced abundance in core areas; Kent, Sussex, Essex and Hampshire remain strongholds.

Nightingales: the midnight songbird

While the species is widely referenced in British popular culture, fewer and fewer people are getting the chance to experience the Nightingale first-hand. Mike Drew, Biodiversity Action Plan Scientist at Anglian Water and John Black, a Nightingale RAS-ringer in Kent, explain how monitoring projects are helping to determine the causes of Nightingale declines.

GRAFHAM WATER

Grafham Water is owned by Anglian Water. It was constructed in the 1970s as a reservoir for drinking water and supplies over half a million people in the English East Midlands. In 1982 the reservoir was designated a Site of Special Scientific Interest (SSSI) as it holds more than 1% of the British populations of Great Crested Grebe, Coot and Tufted Duck. The Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire (Wildlife Trust BCN) have been managing the nature reserve around the reservoir since the mid-1980s and, along with surrounding recreational areas, it now attracts over 500,000 visitors a year.

Grafham Water is known to have an established population of Nightingales and in 2012 Anglian Water, BTO and the Wildlife Trust BCN collaborated on a three-year project to survey territories. Anglian Water also provided funding to attach 20 geolocators to Nightingales, enabling data on migration routes and wintering areas to be gathered. Grafham Water was selected as one of the sites where geolocators were fitted, with others deployed in the Norfolk fens and Kent (see page 8).

SURVEYING AND RINGING

During 2012–15, surveys were carried out between April and June to record singing male Nightingales at Grafham Water. The surveys, which took about three hours to complete, were carried out four times each week, two at midnight and two just before dawn, whatever the weather. The positions of the singing males were marked on a map to work out where the territories were.

As part of the project, Nightingales have been caught and ringed at Grafham Water to provide further information about their distribution and territories. Nets were set at 22 different locations determined by the results of the territory mapping, totalling 360 m of linear coverage during the three years of study. Sound lures were used to help catch the birds, which were fitted with metal rings and processed; in addition to standard biometrics (wing, weight), tail and tarsus measurements were also taken.

FITTING GEOLOCATORS AND GPS TAGS

At Grafham Water, three Nightingales were also fitted with geolocators in 2012. The geolocators, which weigh 0.75 g, record light levels against a clock and

MIGRATION

One of the Grafham Water Nightingales, named '083' was caught as an adult on 12 May 2012. He took six weeks to make the epic 3,000-mile journey from Britain to West Africa, stopping over in southern Portugal before crossing the Sahara. Having spent the winter in western Senegambia and coastal Sierra Leone, he made the arduous journey back to Britain, via Spain and northern France, returning to Grafham Water on 19 April 2013. He was last caught in 2015 holding the same territory as he had in 2012.

Migration route of Nightingale 083. Map source: National Park Service

calendar to track bird movements over long distances, providing valuable information about their migratory journey between England and their West African wintering grounds. However, in order to retrieve the information from the geolocators, the Nightingales needed to be recaptured and the devices removed – no easy task for a bird most at home in dense scrub! Of the 20 geolocators fitted to birds across Britain, 13 were retrieved, including two at Grafham Water, and sent to BTO HQ for analysis.

Having successfully trialled the technology, a further research project for 2015–20 is using more sophisticated GPS tags, weighing 0.9 g, on some birds, as well as geolocators on others, to gather additional data. This is the first time that these tags have been used on a small, long-distance migrant bird and, by using the GPS network of satellites, we will be able to get very accurate point data (down to a few metres!) at each stage of the birds' migration. In 2016, two birds caught at Grafham Water were fitted with GPS tags and another bird was caught with a geolocator already fitted, which was removed for analysis.

BEYOND RINGING

The locations of all the Nightingales that were ringed at Grafham Water are mapped to show their distribution across the site and identify where the territories overlap. This mapping has provided valuable information about the movements of Nightingales within the site and is now being used to plan habitat management work.

Mike Drew

OUT ON THE RAS IN KENT

I started three RAS projects in April 2011, although I didn't know it at the time... Extended time off work, plus a tip-off from the Forestry Commission (FC), conspired to get me out to Orlestone Forest in Kent to establish a new ringing site and, with help from friends, I managed to ring 61 Nightingales over the next few months. I casually mentioned it to Jez Blackburn (at BTO HQ), who responded with "61 Nightingales? That's a RAS!". The adventure had begun.

Orlestone Forest SSSI is owned by the FC, covering 388 ha and mostly consists of high-canopy woodland. Birch coppice and scrub make up 41 ha, comprising five core Nightingale breeding clusters. The methodology is simple: census all singing males, use a sound lure and target trapping to maximise the male sample, then employ a standard mist-netting approach at each subsite to catch females and fledglings. This involves around 20 visits / 120 hours trapping effort each year and some ridiculously early starts. As the most productive time for catching them is the first few net rounds, nets are opened 30 minutes before dawn.

THE RESULTS SO FAR

In total, there have been 392 captures of 252 new Nightingales over five RAS seasons, providing around a quarter of the British & Irish ringing total each year for fully grown birds. This has provided a lot of retrap and biometric data, prompting a change in the recommended ring size for adults (from A to A–B) as 77% of adults had a tarsus width > 2.0 mm. Site fidelity is high; of 51 individuals retrapped repeatedly over several years, 82% return to the same subsite and one has been caught in the same net each year since 2011 while twice carrying geolocators to and from Guinea-Bissau. Orlestone Forest was included in the

THANK YOU

The Grafham Water project has required a lot of hard work and dedication. May I thank the partnership between Anglian Water (for funding the Nightingale research), the BTO and its field team and the Wildlife Trust BCN. I'm also grateful for the support from all of the volunteers and bird ringers who have got up very early or stayed up late to survey and catch Nightingales.

BTO's Nightingale tagging project in 2012, 2015 and 2016, thanks initially to a £2,000 contribution from the FC. This year, eight GPS tags and 10 geolocators were provided by BTO and fitted to males as they were captured for the RAS.

Prior to this year, the RAS seemed to be documenting a worrying decline from 54 singing males at the beginning to 34 in 2015. One factor that does not seem to be influencing this is habitat availability and quality, as the area has been managed for Nightingales by local FC staff since they recognised that breeding numbers increased in response to scrub establishment following the big storm in 1987. Deer and predator numbers could potentially influence trends but have not altered significantly during the RAS; the main factor that appears to have a direct influence on the population size at this site is the impact of weather on the number of young reared.

Although only a small sample size, the number of fledglings produced each year relates to average temperature and rainfall, with more ringed in years with lowest precipitation. This correlation is backed up by observations made on site. In 2011 and 2015, the success of the breeding season was obvious due to the conspicuous nature of family groups throughout the wood, whereas in 2012–13 the scrub in late June and July was very quiet. Mean adult survival is around 35% or higher, and in 2016 we recorded a population increase for the first time, with 43 singing males on territory, 40 of which were trapped, plus 19 females; 23 of the adult sample were retraps from previous years. It was encouraging to see an increase in singing males, probably due to recruitment from a good breeding season in 2015, which was sufficient to compensate for a fall in adult return rates this year.

NOT JUST NIGHTINGALES

It isn't just about Nightingales though; the by-catch of around 600 birds of 40 species per season provides useful data in itself, and these have been used to register two additional RAS projects on Garden Warbler and Willow Warbler. One Garden Warbler that we ringed was particularly memorable, as I saw it in Ghana whilst helping BTO tag Nightingales as part of the Migrant Birds in Africa project, then in Kent on the RAS, then back in Ghana again the following year – the first one ringed south of the Sahara to be found in Britain & Ireland!

Other notable species are also present. Turtle Dove numbers have returned to their highest level since 2011, with seven calling males this year, and conspicuously high numbers of Lesser Spotted Woodpecker in 2012 and 2016 appear to reflect high breeding success in 2011 and 2015, similar to that of the Nightingales. One of the Lesser Spots trapped this year was a very fresh fledgling; sadly, evidence of breeding is now reportable to the Rare Breeding Birds Panel due to their population decline.

CONCLUSION

What have I learnt about Nightingales? Don't tell Jez how many you have ringed! Seriously though, undertaking a RAS on a species like Nightingale does take you on an interesting journey following their ups and downs, and provides a data set that the BTO can use as a piece of the jigsaw to understand the pressures affecting long-distance migrants. **John Black**

THANK YOU

Special thanks go to Vicky Gilson for all her help over the years sharing the fieldwork; also to Nick and Jill Tardivel and a host of other ringers who have braved the infamous Orlestone mozzies for the Nightingales. Funding and equipment has been provided by the FC, Ashford Borough Council and BTO. Final thanks to Chris Hewson for the invitation to Ghana and inclusion in the tagging work.

Nightingale with GPS tag, by John Black

News from the Ringing Committee

Ringing Committee met at Thetford in April 2016. We were pleased to welcome new members: Ian Bainbridge (appointed by BTO Council and proposed Chair from 2017), Rich Broughton (elected by ringers), Ellen Marshall and Kate Clarke (the new T and C representatives respectively). As usual, I suggest that, if you haven't done so already, you have a look at the minutes which are on the ringers' pages of the BTO website (**www.bto.org/ringing-committee**).

CES net ride, by Rob Robinson

RIN discussed developing more structured ringing projects, such as CES-style ringing outside the breeding season.

We had a substantial discussion about the strategy for the Ringing and Nest Record Schemes over the next 10 years. Most of the details are contained in the minutes, but a number of major points emerged, the first of which was the balance between general ringing and nest recording and more structured approaches. General ringing and nest recording will always have a key role, providing motivation and training opportunities as well as generating novel discoveries which would not be found by structured programmes. However, it is clear that structured approaches such as ringing projects, systematic nest recording and the existing CES and RAS schemes provide some of the best data in terms of the important demographic parameters we are all trying to monitor.

It was felt that we should be looking to develop more schemes to take structured approaches, and suggestions made included a garden ringing scheme and the extension of CES-type methods outside the breeding season. We were reminded that CES initially grew out of an initiative by a few ringers and any ideas proposed will need to be developed in close partnership with the volunteers themselves and, given the current position with limited resources, additional funding would be needed.

One of the great successes of the previous strategy is that the target for collection of computerised data has been met in spades – nearly all ringing and 70% of nest record data are now submitted via IPMR, soon to be superseded by DemOn. There was a discussion about how to make best use of these resources by encouraging and helping more people to analyse them and write up the results. It was agreed that a small working group will take forward these ideas and draft a discussion paper for the next meeting of RIN in October.

We had a short report on progress with DemOn. At the time of RIN this was about to be tested by a small group of ringers familiar with computer systems, chosen from those who attended the DemOn workshop in February. Subsequently these tests have gone well and we will be looking to see a wider roll-out in the autumn.

You will recall that at the October 2015 RIN we agreed a substantial increase in ring prices. In April 2016 we considered ringing annual fees and decided that these too should also be increased more than usual, by 15%. As we informed you by email in September, the JNCC contribution to the funding of the ringing scheme has been cut substantially while the number of ringers has risen; this has meant that the contribution from BTO core funds has continued to increase, which is not a sustainable situation. The increases in ring prices and annual fees will help the situation and there have already been some savings made in running costs, in particular from the new database; we can expect more once the new DemOn system is fully up and running.

Chris Redfern is standing down as editor of *R&M* – a job he has been doing since 2005. Thank you Chris for all your hard work and perseverance over that period. Chris's successor will be Graham Scott, a ringer in East and North Yorkshire who is Associate Dean (Education) at the University of Hull.

Although not really a matter for the April RIN, the last few months have been a difficult period for the staff in the Demography Unit. Jacquie Clark has been on long-term sick leave through the summer and the Head of Licensing post has yet to be filled. I would like to record my thanks to the other staff who have pulled together to keep everything running comparatively smoothly over this period.

Ken Smith, on behalf of Ringing Committee

Cutting back on cutting back

The Nest Record Scheme is the biggest and longest-running of its type in the world. Unsurprisingly, the resource created by nest recorders is used in a huge range of scientific analyses, the most recent of which are summarised on p18. Publishing papers in journals may seem like a purely academic exercise, but it's actually a vital step in influencing policy, providing robust evidence that feeds into political decision-making. Dave Leech reports on a recent example of NRS data feeding into practical conservation decisions.

Linnet nest, by Moss Taylor

NRS data shows that the main Linnet breeding season runs from 16 April to 24 August.

I know from feedback that many recorders would like to see NRS data put to practical use more regularly, the prime example being guidance on vegetation clearance during the breeding season. In some circumstances, particularly where human health and safety are involved, such management may be unavoidable, but careful planning may help minimise damage.

AGRICULTURAL HEDGE CUTTING

Advocates of such practical applications will be pleased to hear that, as part of a legislative review, we received a data request from JNCC last summer concerning the length of the breeding season for species likely to be nesting in hedgerows or the rank vegetation beneath. Prior to 2015, trimming or cutting of hedgerows in English and Scottish farmland was not permitted between 1 March and 31 July, with an equivalent ban in Wales and Northern Ireland extending to 31 August; the focus was therefore on the potential for birds to be nesting in this final month.

FINCHES AND BUNTINGS AT RISK

The 5th percentile of the laying date and the 95th percentile of the fledging date were calculated for 50 relevant species, ranging from Wren to Buzzard, between 2004 and 2013; the difference between the two measures gives the period over which the central 90% of nests were likely to be active. Our results showed that 24 species were relatively unlikely to be breeding after the end of July, including thrushes, tits and some warblers (e.g. Chiffchaff, Blackcap).

A further 14 species typically extended breeding into August and could therefore be impacted by hedge cutting that was currently legal, including several birds of conservation concern such as Spotted Flycatcher, Dunnock, Linnet and Reed Bunting. In fact, a significant proportion of Bullfinch, Goldfinch and Yellowhammer populations still have young in the nest into the first few weeks of September, so it's really not just pigeons and doves that are breeding at this time. On the basis of this evidence, the English and Scottish bans were extended to 31 August.

A CONSERVATIVE ESTIMATE?

Fledglings' use of hedgerows does not cease when they leave the nest and young birds are unlikely to be mobile enough to avoid machinery for several weeks afterwards, so these figures are likely to underestimate the period of dependency. Late nests may also be under-represented, as finding them becomes progressively harder as vegetation grows and numbers drop. Despite the challenges, however, this legislative change demonstrates the value of monitoring those final broods and highlights the importance of BTO nest recorders to bird conservation.

First egg and fledging date

The date of laying of the first egg (first-egg date; FED) can be generated from nest records, even those found after clutch completion, by back-calculation based on the duration of the laying and incubation periods and information about chick age provided by the NRS status codes; the more frequently the nest is visited, the more accurate the estimate produced. Likewise, the fledging date can be estimated for each nest by adding the average duration of the laying, incubation and fledging periods to the FED estimate.

Yellowhammer nest, by Mike Toms

Tawny Owl chicks in willow tree, by Ruth Walker

In natural sites, chicks leave the nest at less than a month old but they stay longer in boxes. If a single, large chick is found in a nest, it is worth checking the surrounding vegetation for siblings that may have 'branched' prior to fledging.

Tawny Owl: 'the bird of night'

Portrayed by Shakespeare in *Julius Caesar* as an omen of impending doom, the Tawny Owl's own fortunes have taken a downturn in recent years and the species now finds itself on the *Birds of Conservation Concern* Amber List. As setting up studies is more valuable than ever, we've asked experienced fieldworkers Dave and Katy Anderson, Alan Ball, Adrian Blackburn, Peter Johnson, Simon Lane, Jim Lennon and Brian Little to share their considerable monitoring knowledge.

DESIGNING A PROJECT

Tawny Owl is a cavity nester that readily takes to artificial nest sites, making it an ideal species to monitor using boxes. While they are, at heart, a woodland species, Tawnies will also breed in more built-up areas; whether they fare as well as birds in more natural habitats and whether this has changed over time is an interesting question and one which more ringing and NRS data are needed to address.

As the density of owls is determined by food abundance, so too is the optimal placement of boxes. In good habitat, such as mature native woodland, boxes can be placed at c. 500-m intervals with up to four boxes erected per km square. Occupancy rates may be as high as 50%, with the more frequently occupied boxes often being those situated towards the outside of a wood. Poorer-quality habitat, such as conifer forest, requires a lower density of boxes. If possible, avoid placing Tawny Owl boxes near traditional Sparrowhawk and Long-eared Owl nest sites to avoid competition; they should also be erected well away from busy roads to reduce the risk of owls being killed while hunting.

NEST-BOX DESIGN

While an entrance hole diameter of 150 mm is standard, box designs vary greatly, from chimney-style boxes angled at 30 degrees from the horizontal, to more traditional large-hole boxes and even plastic barrels. Tawny Owls will occasionally nest in Kestrel boxes or 'A-frame' boxes designed for Barn Owls too. Wooden boxes should be constructed from durable materials such as marine ply or larch and can be weather-proofed with roofing felt if placed at an exposed site. Some designs allow pulli to be accessed via the entrance hole, while others have doors built into the front or side. The deeper the box, the less chance there is of chicks leaving the nest prematurely.

Boxes can be fixed in place using a vertical wooden batten nailed to the tree (best to use aluminium or copper nails if in a commercial plantation). If nailing directly to a tree, hammering headless nails into place first and then hanging the box on them is much safer and easier than trying to hold a box and nail it to the tree simultaneously. They should always be placed facing a relatively open area that provides a clear flight path. In dense

BOX DESIGN

An example box design can be downloaded from **www.bto.org/other-ringing-resources**

woodland, where boxes are not exposed to direct sunlight or prevailing winds, orientation is immaterial; at more exposed sites, orienting the box to the east or north-east is preferable. Boxes should be placed at least 2.5 m off the ground, and higher if security is an issue, but at a comfortable height for access without needing excessively long ladders. In areas where Pine Martens are present, predation can be reduced by wrapping the trunk of the tree below the box with thick plastic pond liner; the plastic must be at least 1 m in height and the tree must be isolated from others to prevent martens simply jumping across.

Ideally, nest boxes should be in place by late summer or early autumn as this gives birds the opportunity to find them long before nesting takes place. Occupancy will depend on demand, so can occur quite quickly but may take some time (up to 11 years in one case). Tawnies don't build a nest structure and eggs laid on bare wood can become chilled and addled, or chipped. It is therefore important to add 5–10 cm of substrate in the bottom of the box in which females can make a scrape; wood shavings or needle litter from the forest floor are ideal, but fine sawdust should be avoided as this can damage eggs and chicks while hatching. Females will excavate the scrape in the autumn and this is a sign that a territorial female has 'claimed' a box; once it is occupied, male Tawny Owls will provision the female throughout the winter. Boxes should be cleaned after the chicks have fledged and the substrate checked for rings before being replaced.

PULLUS RINGING AND NEST RECORDING

Tawny Owls are generally quite synchronous within sites with respect to laying dates, but timing can differ between sites due to differences in food availability or weather. In years where food is abundant, Tawnies may start nesting as early as February, but in poor prey years breeding is likely to be delayed or even suspended altogether. The species is very sensitive to disturbance at the egg stage, so monitoring should be undertaken with caution before mid to late April, when most chicks should have hatched. NRS data show that clutch sizes can be recorded without influencing nest outcomes and the data are of value, but we strongly advise new recorders to seek best-practice guidance from the BTO Nest Records team or experienced recorders before monitoring begins.

Wooden box with blocker, by Jim Lennon; Barrel box, by Peter Johnson

A wooden box with side door and blocker. Barrel boxes are more lightweight and stay drier but are not as warm as wood.

On average, 2–3 eggs are laid, with incubation commencing from the first egg and lasting 28–30 days. There is a relatively large window of opportunity for ringing young Tawnies but 14–20 days old, when chicks will be big enough to take a ring but will not have left the nest, is an ideal age. As a rough guide, if a bird is still downy, with feathers still growing and weighs around 140 g, they are big enough to ring; wing length can be a useful indicator of age and should be recorded if possible.

CATCHING ADULTS

There is a significant risk that female Tawny Owls will desert a clutch if caught on eggs, so adults should not be trapped during incubation or on chicks less than a week old; after this time, they can be caught safely. The female will remain with and brood the young for at least the first 10 days, and longer in poor weather. In contrast, the male rarely enters the box, electing instead to call the female off and pass food to her nearby.

Adults can be caught as they leave the cavity by placing a hand net (e.g. fisherman's landing net or small-mesh clap netting fixed to an angling-net frame and pole) in front of the entrance hole. Alternatively, a 'blocker' (a piece of foam attached to the

REFERENCES

Hardy, A.R., Hirons, G.J.M., Stanley, P.I. & Huson, L.W. (1981) Sexual dimorphism in size of Tawny Owls (*Strix aluco*): a method for sexing in field studies. *Ardea* **67**: 181–184.

Mikkola, H. & Lamminmäki, J. (2014) *Moult, ageing and sexing of Finnish Owls*. ISBN 978-951-98263-1-8.

Petty, S.J. (1992) A guide to age determination of Tawny Owl, *Strix aluco*. pp. 89–91 in The Ecology and Conservation of European Owls. JNCC UK Nature Conservation No. 5.

Petty, S.J. (1994) Moult in Tawny Owls *Strix aluco* in relation to food supply and reproductive success. pp. 521–530 in Meyburg, B.-U. & Chancellor, R.D. (1994) *Raptor Conservation Today*. WWGBP/Pica Press.

Rantamäki, A. & Aaltonen, E. (2015) Sexing of Tawny Owls in field measurements. *Satakunnan Linnut* **47**: 45–47.

AGEING AND SEXING TAWNY OWLS

There are characteristic differences between the flight feathers and primary coverts in adult and juvenile Tawny Owls. Juvenile primary and secondary feathers have a thin and broken terminal band; in adults this is thick and complete (1). Juvenile primary coverts usually show three dark bands, while adults typically have only two (2).

Tawny Owl moult is linked to breeding success, with non-breeding birds initiating moult earlier and carrying on for longer (e.g. from April/May to September/October); birds that have reared chicks replace relatively few feathers (Petty 1992, 1994). Adult birds will, therefore, typically show several generations of feathers within the wing and it is these that can be used to age the bird. Jeff Baker's revision of the *Non-Passerine Guide* provides more detailed information on ageing.

Tawny Owl wing, by Ian Blackmore

Female Tawny Owls are, on average, significantly larger than males in terms of both body weight and wing length. Using either of these measures in isolation can result in birds being sexed incorrectly because of the degree of overlap between the sexes, but the error is reduced if the two measures are used in combination. This approach, developed by Hardy et al. (1981) used measurements in the following formula:

D = 17.46 – (0.057 x wing length) – (0.005 x body weight).

If the value of D is greater than zero, then the bird can be classified as male, although one in ten birds could still be misclassified. Another option may be to use the length of the hind claw (see below). If sexing on biometrics alone, **please** record the sexing method as 'S' in IPMR/DemOn.

ADDING TO OUR KNOWLEDGE

More information on the moult patterns of British Tawny Owls would be very useful, as would measurements of birds of known sex. Rantamäki & Aaltonen (2015), working on Scandinavian Tawny Owls, found the length of the hind toe claw to be a useful indicator of sex – the hind toe claw was less than 16 mm in males but greater than 16 mm in females (n = 56), though note that Scandinavian Tawny Owls are larger than ours. Claw length has also proved useful in other *Strix* species, so there is an opportunity for British researchers to develop this approach here.

Another approach that might prove valuable is the use of UV light to identify wing moult. UV light causes porphyrin pigments in the feathers to fluoresce, aiding separation of feathers belonging to different generations. Since UV light can be damaging to the eyes of both owls and researchers, the owl's eyes should be shielded and you should also use suitable protection, e.g. UV blocking glasses.

end of a carbon-fibre pole) can be employed to prevent the bird leaving and it can then be caught by hand. The advantage of the blocker approach is that it enables the ringer to choose whether to lift the female off the nest or not. If the female is sitting tight when the nest is inspected, it is often possible to hear chicks squeaking or bill tapping, but beware that the latter sound is difficult to distinguish from the female bill snapping. Females should be returned to the box immediately after processing and the exit hole covered until they are settled, which generally takes just a couple of minutes.

HEALTH & SAFETY

It is advisable to have at least two people present when checking nest boxes, especially when using ladders. Flushed adult birds have been known to attack people, but this is far less likely to happen if there are multiple people present. Tawny Owls are more liable to attack at dusk, when they are more active, and when chicks are large.

NON-TARGET SPECIES

Stock Dove and Jackdaw are regularly encountered in Tawny Owl boxes, as are Kestrel, Barn Owl, Goosander and even Mandarin Duck. The latter sometimes wait until the Tawny Owls have fledged before taking up residence but occasionally will try to lay concurrently, which can cause Tawny Owls to desert. Other species encountered include Mallard, Little Owl and numerous passerines. Perhaps less welcome are the hornets, Pine Martens and squirrels.

FUTURE MONITORING PRIORITIES

There are currently two active Tawny Owl RAS projects, both of which were registered recently, although one does include a substantial amount of historic data. Since the early 1990s, annual Nest Record Scheme totals have held steady at between 350 and 500. We are very grateful for all the work that goes into collecting the data and maintaining the box networks, and hope that this article may encourage others to follow in the footsteps of this article's contributors to help us understand more about this charismatic species and the drivers of its decline.

Obituaries

JOE HARDMAN (1930–2016)

Harry Green tells how, having ringed birds as a schoolboy, he later learned of the advent of mist nets – and that he needed a licence. Referred to Clive Minton, he was passed on to a slight man in a flat cap to teach him the netting technique, who greeted him with a north-country "How do!" and a smile: Joe Hardman. Joe, a dedicated Wash Wader RG man for many years, was one of the gang developing the new rocket (later cannon) nets to catch waders on The Wash. He had a Morris Traveller and then an ancient VW campervan, travelling anywhere: mist netting, wader catching and ringing Sand Martins. Harry involved Joe in forays to net waders and ring seabirds on the Dee Estuary and Welsh islands. When cannon netting gulls on landfill sites, a lot of interesting 'rubbish' used to disappear into Joe's van for personal recycling!

Dennis Cooper of Arden RG observes that many BTO folk will remember Joe and Ann best from conferences at Swanwick; they regularly attended both the General and Ringers' Conferences and for over 20 years handled the bookings for the Ringers'. For many years, Joe was BTO Representative for Warwickshire, organising all BTO survey coverage, while himself operating a CBC and participating in all BTO surveys. He was Chair of RIN between 1991 and 1994 and was was heavily involved in training ringers to improve coverage of both Northern Ireland and the Republic, and later in Malta. Joe and Ann were awarded the Tucker Medal in 1974 and the Jubilee Medal in 1995.

Locally, Joe would ring whatever offered; he was a great pullus ringer, trapper and nest recorder. His own main study focused on the swans of the Avon Valley, but he didn't work only on birds – all wildlife interested him, especially botany and entomology. Joe was active in many organisations; he ran extramural classes on birds for years and many people came into natural history through these classes and their associated field outings. Concurrently, he was generating a team of ringers and surveyors producing a body of data in south Warwickshire, which continues to this day. Joe was a prime example of the senior figures who served the BTO so well in its developing years from the fifties into the computer age.

Joe was a real character, retaining his broad Lancashire accent all his life. He was a great communicator with a vast fund of knowledge on all kinds of obscure topics and had a wry sense of humour. Never the dull academic, he was an intensely practical man with a wide range of quirky interests and many obsessions. Though nimble and utterly fearless in climbing trees, he had a horror of getting wet – unfortunate in one generally found around reedbeds, dinghies and rivers. Those of us who knew him well treasure the fund of anecdotes relating to our experiences with Joe over many years and in many far-flung places.

This obituary was prepared by Arden Ringing Group.

URSULA VERITY MEAD (1939–2016)

Born Ursula Verity Walker on 2 April 1939, Verity, who used her middle name, almost universally shortened to V, can have had little idea of how her life would change when she applied to the BTO for a job at Beech Grove in Tring, when the formerly geographically dispersed Trust first came together in a single location. Chris Mead was soon smitten. Fortunately, one of his virtues was persistence – it is thought that he had to ask for her hand no fewer than 13 times before she accepted. If the church roof had collapsed at their wedding, British ornithology would have been set back for many years. Years later, after BTO moved to Thetford, V became a member of staff again, first tethering 18-m Japanese nets then working at The Nunnery providing a wide range of support.

V was not only a great support to Chris but also a great match for him; holidays catching Sand Martins in remote parts of the country during the Enquiry soon saw to that. No one who was entertained by them in Beaconsfield Road in Tring or in The Nunnery (the other one!) at Hilborough will ever forget it. Together they brought up three talented daughters, Vanella, Harriet and Miranda, of whom they were both very proud.

V had many interests and was extraordinarily well read. She had a great love of, and affinity for, animals. Over the years, The Nunnery became home to quite a menagerie, with its horses, chickens, dogs and cats, not to mention the Swifts breeding in the roof. The sprawling garden was a haven for wildlife. At heart a botanist, V spent many happy hours tending it and had an enviously productive kitchen garden. Sadly, her final years were beset by illness, borne with the characteristic fortitude one would expect. Our thoughts go to her family. She will be much missed.

Peter Wilkinson

Garden Blackbird trap, by Tony Leech

Attention from a local cat necessitated the use of a full suite of defensive options around the drop traps including a raised platform, a string barrier and a sonic scarer; the trap now resembles one of the guard towers at Colditz. Further options may be considered in future!

'Tis the season to be RASing

In this article, Dave Leech uses data from his Holt Blackbird Project to revisit the calculation of return rates, comparing results to those of formal survival models and demonstrating how they can be useful in determining the optimum start and end dates for your RAS.

In the Spring 2013 edition of *Ringers' Bulletin* (Vol 13, No 1, p 14–15) I wrote a piece on how to calculate return rates, a back-of-the-envelope version of survival rate analysis that uses Excel to determine the proportion of birds present in one breeding season that are also detected during the next season. As someone unfamiliar with bespoke survival modelling programs like Mark, I've found this an extremely useful way of exploring patterns in the mortality of my colour-ringed Blackbirds in response to weather conditions and, more recently, to a particularly determined cat.

WANDERERS & SKULKERS

One of the caveats included in that 2013 article was the inability of return rate calculations to account for low detectability. Those of you running projects that rely on resighting or recapturing individuals on an annual basis will be fully aware of two particularly infuriating types of bird; 'the wanderer', who suddenly fancies a change and moves to a nearby site for a few years before returning as if nothing had happened, and 'the skulker' who hides colour-ringed legs and avoids nets like a true professional. These annoying individuals result in annual gaps, where a bird ringed in season 1 was not encountered in season 2 but is retrospectively known to still be alive and kicking because it was observed again during season 3. Note that not all birds that skip season 2 will survive to season 3, so this can potentially lead to an underestimate of survival rates even if some back-correction takes place. Survival modelling packages cope with such scenarios by calculating an annual detection rate, using these gaps in observations to estimate what proportion of live birds are actually re-encountered each year and adjusting the figures accordingly. In contrast, return rate calculations assume detectability is 100%, i.e. you see every bird that's alive in every year.

RETURN VS SURVIVAL; THE VERDICT

I've always wondered how much difference this assumption made to my results and was finally able to find out when Ruth ran the Holt Blackbird Project dataset through the standard RAS survival rate programs. The comparison presented in Fig 1 shows that, while the absolute value of the survival rate is, as predicted, slightly higher than the return rate (on average by 6%), the difference is very consistent between years (range = 4% to 8%), so the pattern of annual variation is very similar. Any relationship identified between environmental factors and one of these rates should therefore hold true for the other. This similarity is a product of a consistent resighting effort over the years and the high detection rates of individual birds, which Mark estimates at 90% for this study, compared to a RAS average of 40-50%. Both factors are testament to the amount of time my mum puts into watching the traps every day (47,700 resightings and counting since April 2007– thanks mum!).

This is all good news for me, but the important point is that return rates generated from a robust study (ideally

one with a detection rate of at least 80%) can give you a good insight into what's happening with your population without having to resort to complex statistics. As an aside, it's interesting to note that, at 53%, the survival rate in the final year, post feline arrival, is the lowest on record – is this a true reduction in survival rate due to predation (we certainly found more than a few colour-ringed legs in the vicinity), or have birds merely been displaced? I'm hoping that I'll be able to explore this in future using resightings from gardens outside the cat's range.

IT'S NOT WHAT, BUT WHEN

The 2016 season marked the tenth year of the Holt Blackbird Project and I now have a pretty good protocol established for marking a new sample of individuals each year. However, when I started I was making it up as I went along. I knew that I'd want to avoid colour-ringing lots of migrants to get a good survival estimate of my breeding population, but this was a potential challenge at a site situated four miles from the North Norfolk coast; Blackbird numbers swell noticeably over the winter months and I've had several metal-ringed birds marked in winter recovered in Germany and Sweden. So, I didn't want to start colour marking too early in the year, and I also didn't want to mark any birds wandering far off territory post-breeding, as the chances of detecting them again would be low.

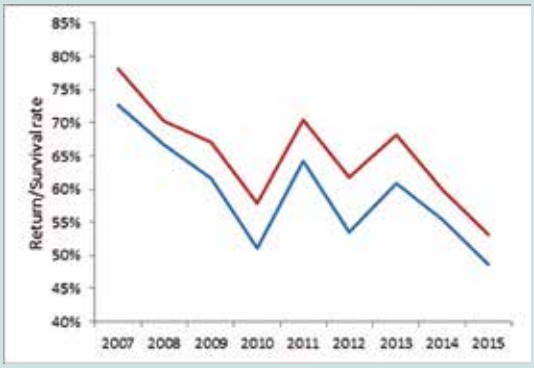
To identify the optimum time for colour-marking, I decided to look at the return rates of individual adult birds and relate them back to the date on which they were originally marked. I limited my initial catching period to the window March–July and Fig 2 clearly shows that the return rate decreases as the season progresses, falling from around 66% of birds marked in March / April to below 50% for those marked in July. This trend is unlikely to be the result of birds ringed towards the beginning of the breeding season being more likely to survive (in fact, they have to survive over a longer period of observation to register as being present the following breeding season), so it almost certainly reflects a decline in site fidelity / detectability.

Interestingly, if you split this by sex, there are some differences, as shown in Fig 2. Female return rates are generally lower (this could be a 'real' difference, but might be inflated by the reduced detectability of the fairer sex) and return rates are particularly low for males ringed in July. This may suggest that females are less prone to post-breeding wandering, but the sample size was extremely small (just five birds), so more information is required for confirmation.

Dave colour ringing a Blackbird, by Tony Leech

OVER TO YOU

The take-home message from all this is that, at my site, the best strategy is to catch towards the start of the breeding season, thus minimising encounters with transient local birds wandering off territory towards the end. I actually decided to avoid catching in both June and July where possible, as this encompasses the period in which marked females and males respectively exhibit the lowest rates of return. The optimum catching strategy will obviously vary between species and locations, but I hope that this article demonstrates how you can use your existing data to target efforts efficiently.



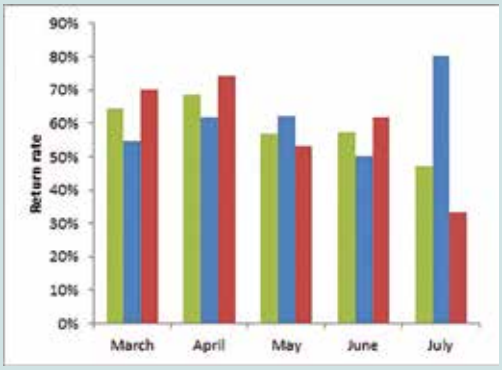


Fig 1 (left): Annual return (blue) and survival (red) rates show very similar patterns of annual variation. Fig 2 (right): Return rates of all birds (green) caught in March and April are higher than those caught in summer, probably due to the greater proportion of wanderers post-breeding. Return rates of females (blue) are generally lower than males (red), but both show a relatively similar seasonal pattern.

Using your data

This feature highlights some of the scientific papers that have been produced using the data that you collect through the Ringing and Nest Record Schemes. NRS data have been used in several recent high-impact studies investigating consequences of climate change in breeding success.

Redstart, by Edmund Fellowes/BTO; Blue Tit, by Liz Cutting/BTO; Pied Flycatcher, by Graham Catley/BTO

HOW DO TROPHIC LEVELS RESPOND TO TEMPERATURE INCREASES?

The aim of this analysis was to compare the influence of temperature and rainfall on the annual timing of events (phenology) across as large a range of UK plants and animals as possible. In total, 10,003 datasets for 812 species collected over the last 50 years were analysed, including NRS first egg dates for 37 species. A previous analysis using the same dataset found that the phenology of secondary consumers (insectivores/carnivores, a group that includes most bird species in terms of nestling diet) had advanced less rapidly than that of primary producers (phytoplankton, plants) and primary consumers (herbivores), leading to potential mismatches between predator demand and prey availability. The aim of this study was to explore the underlying mechanism by calculating the sensitivity of each of these groups to changes in temperature and rainfall. As predicted, plants and herbivores advanced their timing in response to temperature at a much greater rate (4.1 days and 3.7 days per °C respectively) than insectivores/carnivores (1.9 days). If these results are applied to climate projections for 2050, the advances of herbivores are predicted to be much greater than that of plants or insectivores/carnivores.

Thackeray, S.J. et al. (2016) Phenological sensitivity to climate across taxa and trophic levels. *Nature* **535**, 241–245.

TRACKING CLIMATE-INDUCED CHANGES IN PREY AVAILABILITY

While a warming climate increases the risk of mismatch between nestling demand and invertebrate availability, birds may be able to track these advances in prey emergence via one of two mechanisms. Individuals may respond flexibly to the conditions they experience, their response therefore varying over space and time (phenotypic plasticity). Alternatively, successive generations could be genetically selected to advance nesting dates at a specific breeding location (local adaptation). This paper used laying dates derived from over 100,000 nest records of Blue Tit, Great Tit, Chaffinch and Pied Flycatcher to determine which mechanism was in operation. As predicted, timing of nesting was determined by spring temperatures, with laying advancing by 2.3–4.8 days per °C rise, and latitudinal variation suggested that day length plays an additional role. There was no evidence for local adaptation, possibly because birds disperse enough to ensure a flow of genes between populations. All species appeared to track changes in temperature, even if they occured at relatively rapid rates, potentially limiting the impact of mismatches.

Phillimore, A.B. et al. (2016) Passerines may be sufficiently plastic to track temperature-mediated shifts in optimum lay date. *Global Change Biology*. doi: 10.1111/gcb.13302

PREDICTING POPULATION LEVEL IMPACTS OF CLIMATE CHANGE

While many studies have demonstrated relationships between climate change and various aspects of bird phenology, behaviour, physiology and even demographic rates (productivity and survival), the resultant impact on population size, growth rate or extinction risk is rarely tested. The ability to predict which organisms are most likely to exhibit such population-level effects would be invaluable for conservationists, allowing efficient targeting of resources even where species-specific data were lacking. This study developed a framework that could be used to make such predictions and tested it using laying date data for 35 bird species derived from the NRS dataset 1966–2013. Analyses showed that birds displaying the greatest laying date advances experienced the largest increases in breeding success, but that this did not translate to an increase in population growth rate. However, population growth rates of single-brooded species tended to decline as temperature increased while those of multi-brooded species increased, potentially suggesting a positive impact of a warmer climate on breeding season length.

McLean, N. et al. (2016) Predicting when climate-driven phenotypic change affects population dynamics. *Ecology Letters*. doi: 10.1111/ele.12599.

WRENS – TOUGH NORTHERNERS AND SOUTHERN SOFTIES?

Wrens are known to be susceptible to severe winter weather, measured by the authors of this paper as the number of days with a ground frost. This study used BBS data to show that northern populations were more resilient to cold conditions than those in the south. Northern birds were able to tolerate winters with up to 70% more frost days before population declines were observed, suggesting that each Wren population is closely adapted to its local climate. Using information collected by ringers, the study also found that Wren body mass was, on average, approximately 5% lower in the warmest (southwest) than in the coldest (east Scotland) region. Large individuals are likely to be favoured in colder regions due to the thermal advantage offered by their lower surface area:volume ratio and their ability to store more body fat. This finding agrees with Bergmann's rule, a relationship reported widely across many other species. The results of this study show that a single species can cope equally successfully with a range of climates, although the degree to which they are able to adapt to climatic change may well depend on the rate at which it occurs.

Morrison, C.A. et al. (2016) Winter Wren populations show adaptation to local climate. *Royal Society Open Science* **3**: 160250. doi: org/10.1098/rsos.160250.

WHERE HAVE ALL THE FEMALES GONE?

British Willow Warblers exhibit strong regional differences in population trends, with those in northern Britain faring best. Using CES data, this study demonstrated a trend towards an increasingly male-biased sex ratio, from 50% in 1994 to 60% in 2012. This trend was most apparent in southeast England, where BBS results show populations have recently declined the most and Willow Warblers are now found at relatively low densities. Furthermore, productivity (the ratio of juveniles to adults captured on CE sites), decreased as the proportion of males increased, suggesting that female availability was limiting breeding success in these areas. While female survival rates are slightly lower than those of males, it is thought to be unlikely that this extra mortality is causing the skewed sex ratios. A more likely explanation is that dispersal or recruitment differs between the sexes with females choosing to nest at sites with a high abundance of males. This study demonstrates the importance of breeding-season ringing in studying population declines as traditional census surveys, which estimate abundance through detection of singing males, may not accurately reflect the number of pairs present.

Morrison, C.A. et al. (2016) Causes and consequences of spatial variation in sex ratios in a declining bird species. *Journal of Animal Ecology*. doi: 10.1111/1365-2656.12556.

DO SURVIVAL CHANCES DEPEND ON MIGRATION ROUTE?

Satellite tags were deployed on 42 male Cuckoos from nine different breeding locations in England, Scotland and Wales, allowing their movements to be tracked over 56 autumn migrations between 2011 and 2014. Individuals migrated either southwest via Spain and Morocco (the 'west route'), or southeast via Italy or the Balkans (the 'east route') before converging in the Congo Basin of central Africa. Birds taking the west route left eight days later on average than those taking the east route. They were also more likely to die in Europe, before undertaking the Sahara crossing, even though their route was 12% shorter to this point. This suggests the conditions at stopover sites are important and demonstrates route-specific costs of migration for the first time. There was no difference in survival between the two groups during the rest of their southward migrations, or during their return northward journeys to the breeding grounds. Population changes in the nine breeding locations were correlated with the proportion taking each route, and hence survival, providing the first direct evidence that conditions encountered during migration can have an adverse impact on breeding populations.

Hewson, C.M. et al. (2016) Population decline is linked to migration route in the Common Cuckoo. *Nature Communications*. doi: 10.1038/ncomms12296.

The three papers featured on this page demonstrate the diversity of questions that ringing data can be used to answer, from exploring the impacts of British & Irish winters to establishing migration routes across continents.

Wren, by Allan Drewitt/BTO; Willow Warbler and Cuckoo, by Edmund Fellowes/BTO

River Alport, Derbyshire, by Phil Holland

A shallow, babbling stream with a bend in it, like this section of the River Alport in Derbyshire, is an ideal place to set nets to catch Common Sandpipers.

Mist-netting inland waders

Mist-netting waders on inland waterbodies can be very rewarding and there are many reservoirs, gravel pits and sewage treatment works that offer the opportunity to do so. Although unlikely to generate the large catches achievable on the coast, it is still possible to make a substantial contribution to the annual ringing totals for important species such as Green and Common Sandpiper, Ruff and Little Ringed Plover, as Graham Austin and Phil Holland explain.

The most productive time of year for inland wader netting in terms of totals is generally between late July and September when inland waterbodies provide stopover sites for migrating birds and numbers are bolstered by juveniles. Some sites will host waders throughout the year and cold, crisp winter days spent catching can be excellent; opportunities for targeting nesting birds are more limited, but provide valuable survival data, as do breeding-season resightings of birds ringed at other times of year.

Waders that have been quietly feeding through the day become more active in the half-light, grouping together and looking for a safe spot to roost for the night, so in general, catching is most effective at dusk or dawn. Daytime sessions shouldn't be written off though, and species that feel comfortable in taller vegetation, such as Snipe and Jack Snipe, can be ringed throughout the day. If netting in the evening, nets should be set about half an hour before sunset, giving any waders in the area chance to settle after being disturbed; the aim being to catch during a one-hour window between sunset and darkness. Continuing through the night is possible, although at a much reduced catching rate, but the half hour before sunrise will be more productive.

POSITIONING NETS

Prime locations to site nets are spits of mud or sand protruding out into the water, especially if they have a low profile. When in flight, waders will often maximise their route over water, leading them to arrive and exit steep-sided reservoirs and pools via the corners or mouths of inlets, presenting another catching opportunity. However, while such theory can be helpful, nothing beats a good recce of the site beforehand to establish a plan based on the behaviour of the birds present.

It's not unusual to have as many birds fly under the net as over it; if netting over dry ground, nets can therefore be set very low, for example 10 or 15 cm above the ground when targeting Common or Green Sandpiper. If over wet mud, then this needs to be increased to a height that will keep pocketed birds clear of the substrate. If setting over water, the net should be set much higher, because although only one or two waders are likely to be caught at a time, there is a chance that other, heavier species such as ducks will hit the net and weigh it down; it is well worth learning the habits of any geese on site! Similarly, nets longer than 12 m should be avoided over wet substrate or water and it is strongly advised to restring nets with 'wader braided' shelf string that is far less stretchy than the standard shelf-string material.

CATCHING AND EXTRACTING

Single-shelf or two-shelf nets are ideal as they will often be set in the open where full-height nets would be silhouetted against the sky. Smaller mesh often catches the wind and can be more visible, but smaller waders can become tangled in larger mesh, so 'standard mesh' nets (38 mm) are recommended if targeting these species, especially if the ringers are not well versed in night-

time extraction. Larger-mesh nets are more suitable for Ruff, Redshank and larger species. Using sound lures can be productive and a mix of contact calls from various target species generally works well. Common and Green Sandpiper seem to respond particularly well to their own flight calls, but a non-specific recording from any wader roost seems to work for many other species – basically, most waders like crowds!

When extracting birds in the dark, avoid using head torches as much as possible; there is only a short catching window and lights will alert other birds to your presence. It is also easy to inadvertently dazzle other ringers and ruin their night-vision. If a light does prove necessary, use a red LED light to minimise disruption.

BEYOND MIST-NETTING

When considering inland wader ringing, think beyond mist-netting. The margins of the water are often quite limited, restricting the birds' options and presenting further opportunities for catching. In some parts of the world, walk-in traps are employed to catch large numbers of waders, but in Britain & Ireland, with our exceptional tides, they tend not to be on the radar of many coastal ringers. At inland sites they can be very effective if positioned between the water and the vegetation along a narrow shore-line. Similarly, spring traps can be baited with mealworms or triggered by trip-wire. Whoosh-nets tend to look far less pathetic on the narrow shore of an inland site than they would on the coastal foreshore, too. And finally, don't forget lamping on dark nights.

HEALTH AND SAFETY

Some inland sites can be quite dangerous if not respected, with, for example, deep mud in settlement pools and various underwater hazards. If aiming to operate at a site in the dark, familiarise yourself with the catching area in the daylight before attempting to catch there and avoid working alone.

Graham Austin

CATCHING COMMON SANDPIPERS

While wader ringing conjures up visions of large teams operating in the dark on saltings, catching Common Sandpipers sits at the opposite extreme and is often an activity for lone-working with a few nets in daytime (as the birds rest at night). Common Sandpiper ringing is definitely not an activity for ringers who like to catch lots of birds; in fair conditions, a bird every three hours of effort would be reasonable, but be prepared to catch nothing at all! Getting to know individual birds better, though, is reward enough!

On wide rivers, lochs or reservoirs, various traps might be needed (see *Ringers' Bulletin*, Vol 12, No 4, p 56–57), but on narrower streams, whether in the breeding hills or in channels on salt-marshes during migration, single-shelf mist nets are effective. The key consideration is that Common Sandpipers fly close to the water so the net needs to be set low, but not so low as to be a danger to any birds that are caught. There may be a convenient piece of eroded bank to stick a pole in, but often a movement of pebbles and rocks is necessary to make a firm base on which to erect the pole. The width of stream will be variable so a variety of nets is handy, e.g. 6 m, 9 m, 12 m. I carry these already strung on the poles to minimise the time for putting the net in place. Sandpipers breed in rough terrain, often a long way from the car so they can also act as a useful hiking pole.

LOCATION

The best locations are sites where the stream is shallow(ish), babbling and with a bend beyond providing a backdrop against which the net is hard to see for a bird skimming close to the water's surface. Common Sandpipers arrive from mid-April and leave in early July. Early in the season, pairs are very active, flying up and down their territory and chasing off intruders. Late in the season the juveniles are easy to

Pectoral Sandpiper, by Robina Churchyard/BTO

'Just about anything can crop up and a site worked regularly over a number of years can rack up an impressive list of species. Having ringed Turnstone and Pectoral Sandpiper in Shropshire, I think anything is possible'. Graham Austin.

catch, but are only about for a short time before migrating south. Erecting two parallel nets close together (c. 10 m apart) can be effective; if the bird sees the first net and rises then it will probably be dropping as it gets to the second, which will be more difficult to see against the ground.

Having set the nets and waited a while to see if the bird flies by voluntarily, it may then be necessary to go beyond where the bird is judged to be and try to move it towards the net. It is important that this is done quickly so that nets are not unattended and if they catch Common Sandpipers (or other unintended species) they can be removed promptly. If two attempts at proactive netting are unsuccessful, the birds have probably deduced that something is suspicious and it is best to relocate the net elsewhere.

Phil Holland

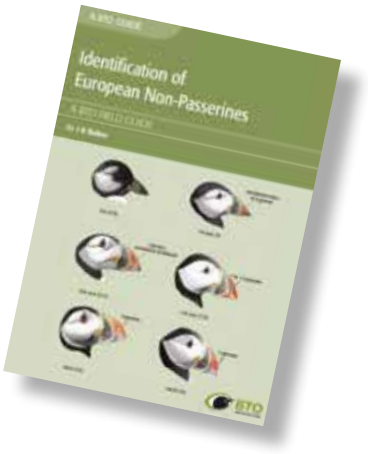
Tracking Common Sandpipers with Highland Ringing Group

Highland Ringing Group has been colour-ringing breeding Common Sandpipers at three sites since 2011 and some of these birds have also been fitted with geolocators. To date there have been no resightings of colour-ringed birds away from the breeding sites. However, 10 birds recaptured with geolocators have revealed previously unknown information. The Iberian Peninsula is important for staging before the long flight to wintering locations in coastal West Africa. Most of the adults have vacated their breeding sites by the second week in July and completed migration by the end of the month, following stopovers of around 10 days in Spain and Portugal. Adults return to their breeding sites from mid-April, having left West Africa two to three weeks earlier.

Colour-ringed Common Sandpiper in flight, by B.S. Bates

Please keep your eyes open and report any colour-ringed waders. Details of who to report sightings to can be found on the Colour Mark Register on the International Wader Study Group website (**www.waderstudygroup.org/projects/colour-marking/**).

Review of Jeff Baker's *Identification of European Non-Passerines*



The eagerly anticipated updated guide to *Identification of European Non-Passerines* was announced in May, combining and updating the previous edition, also authored by Jeff Baker, with some additional species accounts from the *BTO Guide to Holarctic Waders,* complete with colour illustrations. We have been lucky enough to preview an electronic copy of the new guide – by no means have we read it all but we have dipped in to some of the species accounts (for those birds we handle regularly or our trainees struggle with) and the often neglected introductory chapter where the general principles are well explained. At first glance it appears that little has changed, apart from new colour illustrations and the addition of waders, but first looks can be deceiving! The guide is set out in much the same way as the previous edition and in that way is reassuringly familiar to anyone with the original guide. When the species accounts are compared to the original version it is clear that many have been revised; figures showing features presumably found to be unreliable have been removed and there are new figures illustrating novel ageing and sexing characteristics. The colour figures are very useful, providing a big advantage over the previous guide, particularly where feathers include buffs and whites or a subtle tonal difference between ages or sexes. There are a small number of species such as Barn Owl and Merlin where the species account includes ageing (and sexing) pulli. Given the audience of the guide is ringers, at £15 it provides superb value for money; while the species accounts are extensive they aren't exhaustive, but that is fine as it is primarily a field guide and at around 460 pages, it is a big one.

Ewan & Jenny Weston

Noticeboard

ADVERTS

POTTER TRAPS FOR SALE

Two sizes (12" & 16") also Chardonneret and other traps on request. Please contact John Mawer on 01652 628583 or via email **johnrmawer@hotmail.com**

LARGE SPRING TRAPS

One metre square. £80 each + £9 p&p to most UK postcodes, or free p&p for 2+ traps. Proven success in catching harriers, buzzards, Great Skua, Sparrowhawk and gulls. Netting not supplied, but instructions provided. Traps can be dismantled for painting etc. Made to order.
Please contact Dave Dutton via **ruth.walker@bto.org**

CONTACTS

Nest Record Scheme: nrs@bto.org
Ringing Scheme: ringing@bto.org
Constant Effort Sites: ces@bto.org
Retrapping Adults for Survival: ras@bto.org
Colour Ringing: colour.ringing@bto.org
Ringing Data Submissions: ringing.data@bto.org
Licensing (general): ringing.licensing@bto.org
Schedule 1: ringing.schedule1@bto.org
Special Methods: ringing.specialmethods@bto.org
Ringing Sales: ringing.sales@bto.org

2017 TRAINING COURSES

Further details of ringing courses for current ringers can be found on the ringers-only pages of the BTO website. Further details of NRS courses can be found on the website at: **www.bto.org/nrs-training**. Further details of the beginners' ringing courses, along with details of the bird identification and survey techniques training courses run by the BTO, can be found on the Events pages of the BTO website at: **www.bto.org/news-events**

TBC July: Isle of Wight RG Ringing Course – 'T' permit holders and training endorsement assessments only / Contact: Anthony Roberts
27–30 July: Chew Valley RS Ringing Course, **Avon** / Contact: Bob Medland
TBC August: Icklesham Ringing Course, **Sussex** / Contact: Gary Clewley
11–13 August: Ringing Course for Beginners*, **Devon** / Field Studies Council, Slapton Ley. 01548 580466 or enquiries.sl@field-studies-council.org
8–11 September: Gower Ringing Course, **Swansea** / Contact: Kelvin Jones
TBC September: Isle of Wight RG Ringing Course – for all ringers (including experienced trainees) / Contact: Anthony Roberts

* Note: this course is for absolute beginners and is not suitable for current trainees.

2016 CONFERENCES

18–20 November: Scottish Ringers' Conference, Carrbridge, Inverness-shire
19 November: North of England Raptor Forum Conference, County Durham
2–4 December: BTO Annual Conference, Swanwick, Derbyshire

NORTH OF ENGLAND RAPTOR FORUM 2016 CONFERENCE

The conference will be held on Saturday 19 November at the Xcel Centre (**www.Xcelcentre.com**), Aycliffe Business Park, County Durham DL5 6AP and is open to all with an interest in raptors in the uplands. For the full one-day programme and to book, please go to **www.raptorforum.co.uk/conference**. Alternatively, please contact: **davidrawdubsg@aol.com** for more information.

THE 2017 CES VISIT PERIODS

Visit	First Date		Last Date	No of Days
1	Sunday 30 April	to	Wednesday 10 May	11
2	Thursday 11 May	to	Saturday 20 May	10
3	Sunday 21 May	to	Wednesday 31 May	11
4	Thursday 1 June	to	Saturday 10 June	10
5	Sunday 11 June	to	Wednesday 21 June	11
6	Thursday 22 June	to	Saturday 1 July	10
7	Sunday 2 July	to	Wednesday 12 July	11
8	Thursday 13 July	to	Saturday 22 July	10
9	Sunday 23 July	to	Wednesday 2 August	11
10	Thursday 3 August	to	Saturday 12 August	10
11	Sunday 13 August	to	Wednesday 23 August	11
12	Thursday 24 August	to	Saturday 2 September	10

Monitoring priorities: Mute Swan

Recently added to the UK *Birds of Conservation Concern* Amber List, due to the international importance of its non-breeding population, the Mute Swan is big, bold and instantly recognisable, yet surprisingly little studied.

Mute Swan family, by Jill Pakenham/BTO

CURRENT KNOWLEDGE

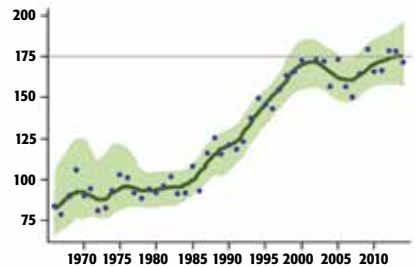
A period of stability between the 1960s and the mid-1980s was followed by a sharp rise in the size of the Mute Swan breeding population until 2000, when the trend plateaued again. There are many potential explanations for this increase, including the ban on lead fishing weights, the activities of animal rescue services, an increase in the extent of breeding habitat due to gravel pit restoration, warmer winter conditions and the additional food resource provided by autumn cereals and oilseed rape. Mute Swan has the potential to be a valuable indicator of changes in water quality and the impacts of climatic change on freshwater ecosystems.

HOW YOU CAN HELP

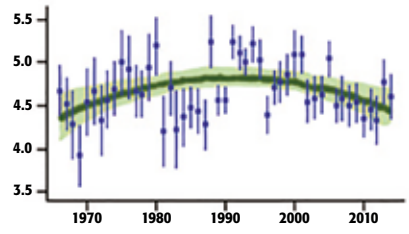
Nest recording – in 2015, just 181 nest records were received for Mute Swan, while 342 pulli were ringed. Nests are generally conspicuous and easily found; while sitting parents can be aggressive, they will often stand when approached allowing eggs to be counted. In sites where the nest cannot easily be reached, counts of hatched young away from the nest throughout the summer still provide valuable information on brood sizes and pre-fledging survival. These observations can be recorded as nest records until the birds are independent, generally c. 120 days after hatching; it is important to ensure that the record relates to a single brood, but breeding densities are low and family groups persist for long periods, so this is usually possible even with unmarked birds.

RAS – in many ways, Mute Swan makes the perfect RAS species. It is big, obvious and lends itself well to the use of colour rings, allowing the public to contribute resighting data. The only downside is that the low nesting density, means a successful project may require quite a large study area. There are currently three RAS projects focusing on Mute Swan, each of which covers entire towns or cities! Pulli can be ringed and included in a RAS when they recruit as breeding adults, simultaneously providing useful dispersal data.

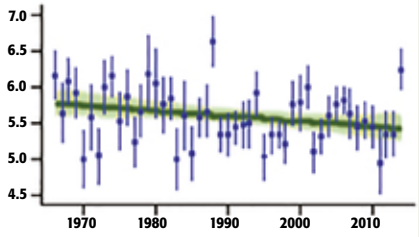
CBC/BBS index UK 1966–2014



Brood size 1966–2014



Clutch size 1966–2014



Graphs shown are taken from the BirdTrends report (**www.bto.org/birdtrends**), where results from the Ringing and Nest Record Schemes are published annually.