The BTO Magazine for Ringers and Nest Recorders

LIFECYCLE

SPRING 2018 ■ ISSUE 7

BREEDING SEASON RESULTS ■ CORN BUNTINGS ■ MONITORING SWALLOWS

TREE SPARROWS

Monitoring for RAS

BTO
Looking out for birds

Editorial

ISSUE 7 SPRING 2018

Welcome to the latest edition of *LifeCycle*. Spring finally arrived here in Norfolk, after what felt like a very long winter, but the cold weather of a couple of months ago seemed to delay the start of the breeding season. Many birds appeared to be late laying this year, which contrasts sharply with the early season in 2017. As usual, this issue contains the breeding season results from last year, produced from the NRS, CES and RAS data that you work so hard to collect each year – our sincere thanks to everyone for their contributions to the schemes. Thanks are also due to all of you who have taken the plunge and embraced DemOn so enthusiastically; to date over 1,400 ringers and nest recorders have logged onto the system. The article on page 30 sets out the NRS functionality now available. We have two articles this month that highlight the results you can achieve from systematic recording projects (page 11 and page 18) and another showing how a population recovery project can turn into a successful RAS. If you've ever considered being an NRS mentor, the article on page 15 should inspire you. And for anyone who has ever run a mile from the hornet in your nest box, the article on page 26 explains just how useful records of other taxa are and how to submit them.

As always, we value your feedback on the magazine and content. 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.

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 is 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)

LIFECYCLE PRODUCTION

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

Articles in *LifeCycle* 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, Richard Broughton and Dave Leech.

Layout, design, imagesetting and typesetting:
Ruth Walker and 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: John Harding/BTO

NEWS FROM RINGING & NEST RECORDING

RSPB RESERVES GUIDANCE

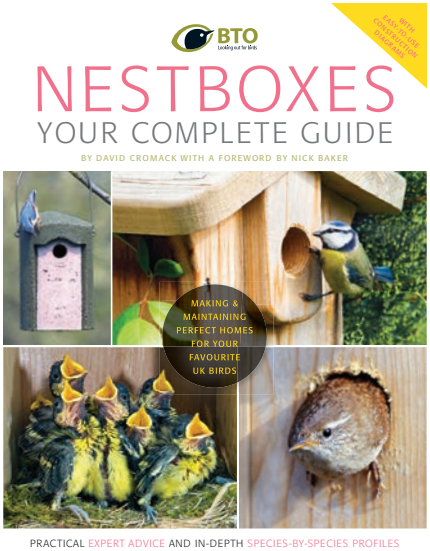
A recent review of RSPB policy concerning ringing on reserves stressed the value of CES and RAS, but not of pullus ringing, leading to permissions being rescinded for some nest box projects. This oversight has now been corrected; if you wish to ring pulli on an RSPB reserve, please follow the guidelines set out in the 'Ringing on RSPB Reserves' article in Issue 3 (spring 2016) of *LifeCycle*.

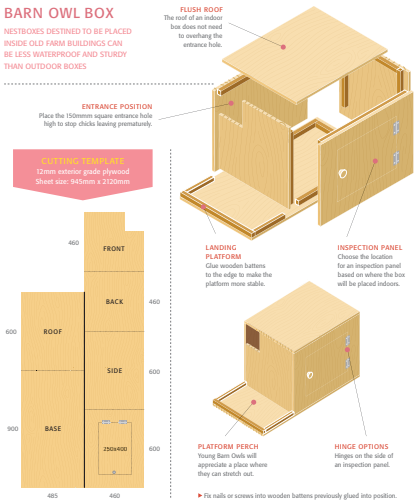
BTO RESEARCH GRANTS

BTO ringers are eligible to apply for a BTO Research Grant of up to £500. Grants are awarded to projects focusing on all aspects of field ornithology, particularly those most relevant to the BTO's core research activities. Preference is given to research carried out in Britain, Ireland and other parts of the Afro-Palaearctic flyway and priority will be given to well-designed research projects that are likely to produce publishable results. Projects undertaken by amateurs will be prioritised; however, collaboration with professionals, including BTO staff, is encouraged. The closing date for applications is 15 December 2018. Find out more at: **www.bto.org/about-bto/bto-research-grants**

IOC TAXONOMIC CHANGES

The British Ornithologists' Union has adopted the global taxonomy of the International Ornithological Committee (IOC) and BTO is following suit, recognising the value in pushing towards a global consensus. We plan to align all of our surveys with IOC, including the Ringing and Nest Recording schemes. We will be making the changes in the background in the next few months. Most people should notice very little change, as the main differences in a British context apply to a number of vagrants (unless you ring many Bean Geese!). Note that whilst we will be following the IOC taxonomy, we still intend to take a pragmatic approach to English names. We will, of course, be maintaining information such as EURING numbers to enable us to link to other schemes as required. For those particularly interested, we will be updating initially to IOC version 7.3, and implementing subsequent updates on an annual basis.





NEST BOXES HIT THE MAINSTREAM

Thanks to the very generous support of Jacobi Jayne & Company, BTO has just published a new guide to nest boxes, their construction and placement. Authored by Dave Cromack and drawing on the expertise captured in the many previous editions of the BTO *Nestbox Guide,* this new publication will be accessible to a broad audience and should see many more nest boxes erected for a range of bird species. The book, which is a softback of 162 pages, is priced at £8.95. Copies can be ordered from our website **www.bto.org/shop** or by post or phone. Please include £3.95 for post and packing.

PULLUS RINGER NEEDED

A ringer with a pullus endorsement is needed to help with a Tree Sparrow project near Spalding in South Lincolnshire, monitoring nests and ringing pulli. There are currently 170 nest boxes, but that will double for 2019. The ringer will also be welcome to mist net on site during summer and winter. For more information, please contact Nicholas Watts on: **nicholas@vinehousefarm.co.uk**

CEH POLLINATOR SURVEY

While we appreciate that many ringers and nest recorders are already fully occupied during the breeding season, some volunteers have approached us to ask about other opportunities to collect data on patches they visit regularly. BTO is increasingly working with CEH to collect data on other taxa; the UK Pollinator Monitoring Scheme (PoMS) seeks the help of volunteers to collect data on pollinating insects, a group whose conservation status is of increasing concern.

There are two ways to get involved. The first involves a 10-minute Flower-Insect Timed Count – anyone can take part, at any location where there are flowers and insects, and a full survey guide is provided. A smaller group of volunteers is required to help with the systematic surveying of random sites across England, Scotland and Wales. This involves 'adopting' a 1-km survey square, meeting on site with a PoMS team member and visiting the square on three further occasions during summer to collect insects with water-filled pan traps.

If you would like to volunteer please email **poms@ceh.ac.uk** and visit the website for more details.

2017: the earlier the better?

As mild weather brought an early start to spring 2017, ringers and nest recorders were hoping that, following two poor breeding seasons in 2015 and 2016, things didn't really come in threes. Thankfully, 2017 proved to be a much better year for migrants and residents alike, as Ruth Walker, Carl Barimore and Dave Leech explain.

Garden Warbler, by Liz Cutting/BTO

Fewer Garden Warblers were recorded in 2017 than in any previous year since CES monitoring began.

The number of nest records submitted for the 2017 season so far is 44,498, with the final number expected to reach c. 45,000, a slight drop on the totals for 2016 (46,739), again reflecting reduced investment in NRS while we continue to focus on DemOn development. The number of CES submissions increased to 135 in 2017, while the number of RAS projects that ran was at least 196. The time and effort put into nest recording and undertaking CES and RAS every year is phenomenal and our sincere thanks go to everyone who collected data during 2017.

In contrast to the previous year, winter 2016/17 was relatively dry and mild until late February, when conditions turned stormy. After a dry and mild start to spring for most of Britain & Ireland, there were numerous late frosts in the second half of April. May was generally warm and wetter than average in the south-east but dry in the north and west.

Throughout the summer (June to August), rainfall totals were above average in every month and mean temperatures were at or above average; June 2017 was the equal fifth warmest and the sixth wettest June since records began in 1910.

MIGRANT PASSERINES

Migrant abundance and survival

As always, there were winners and losers during the 2017 breeding season. Three migrant species recorded through CES declined significantly in 2017 compared to the five-year mean (2012–16) (Table 1). Two, Garden Warbler and Whitethroat, are long-distance migrants, whilst Blackcap is a short-distance migrant; Garden Warbler numbers were at their lowest since CES monitoring began in 1983 and it is interesting to note that all three species exhibited significant declines in productivity on CES sites during the 2016 season. That said, numbers of both Reed Warbler (long-distance migrant) and Chiffchaff (short-distance migrant) increased significantly compared to the five-year mean, despite a similarly poor breeding performance for both in 2016; Chiffchaff was recorded in higher numbers than in any previous year. The positive results for both of these species were driven by particularly large increases in numbers in the north, the region in which breeding was least impacted by weather during the previous season.

Adult survival rates, as monitored through CES, declined significantly for all of the above-mentioned species, with the exception of Garden Warbler, suggesting that overwinter survival of adult birds was not the driver of the increases for Chiffchaff or Reed Warbler, but may have contributed to the declines in Blackcap and Whitethroat; it is possible that those juvenile Chiffchaffs and Reed Warblers which did fledge exhibited high overwinter survival, helping to swell numbers in 2017.

While the long-term trends (1983–2017, Table 1) for all of the long-distance migrant warblers monitored through CES show a decline in abundance, the trends for Blackcap and Chiffchaff are both positive. Chiffchaffs have been recorded in particularly high numbers in recent years; the record for the highest number of adults encountered on CES has been broken in six of the past seven seasons. The dates on which Chiffchaffs arrived back in the UK have advanced by two weeks since the 1960s, possibly as a result of climate change, leading to them breeding earlier. It is possible that this change in the timing of their breeding has coincided with similar advances in the availability of their food resource, contributing to the dramatic

Table 1. National and regional CES results for 2017. For long-term trends, ↑ indicates an increase of <25%, ↑↑ of 25–50% and ↑↑↑ of >50%, while ↓ indicates a decrease of <25%, ↓↓ of 25–50% and ↓↓↓ of >50%. Percentage changes from the five-year means (2012–16) are also reported for 2017, with significant decreases shown in **red** and significant increases in **blue**. '*' denotes a small sample size. Sample sizes are currently not large enough to allow regional survival trends to be produced. See CES website for map of regions.

	ADULT ABUNDANCE					ADULT SURVIVAL		PRODUCTIVITY				
	1985–2017	2017 vs 2012–16				1985–2017	2017 vs 2012–16	1985–2017	2017 vs 2012–16			
Migrants		National	North	East	West				National	North	East	West
Chiffchaff	↑↑↑	**19**	**43**	**17**	4	↑	**-23**	↓	-5	**-35**	0	**22**
Willow Warbler	↓↓↓	5	9	**-19**	**24**	↑	-13	↓↓	**-17**	**-18**	6	**-29**
Blackcap	↑↑↑	**-8**	-8	-4	**-14**	↑↑	**-28**	↓	**27**	17	**14**	**64**
Garden Warbler	↓↓	**-20**	-14	**-18**	**-30**	↑	-27	↓↓↓	**21**	4	17	37
Lesser Whitethroat*	↓↓↓	-11	-44	-10	0	↓↓	-45	↓	-24	-29	-11	**-50**
Whitethroat	↓↓	**-9**	-4	-10	-9	↑	**-35**	↓↓	3	-11	-1	**25**
Sedge Warbler	↓↓↓	-2	-9	5	-4	↑	-6	↓↓	-3	**-29**	7	0
Reed Warbler	↓	**5**	**49**	2	6	↑	**-16**	↑↑	-1	**-34**	1	3
Tits												
Blue Tit	↑	**-12**	2	**-16**	**-20**	↑↑	**-24**	↓↓↓	**53**	0	**68**	**108**
Great Tit	↑↑	**-10**	9	**-14**	**-34**	↑	-2	↓↓	**35**	-1	**41**	**120**
Willow Tit*	↓↓↓	-40	-39	-50	81	-	-	↓↓↓	36	22	95	-
Long-tailed Tit	↑	0	-4	0	4	↓	-7	↓	**19**	**32**	6	**38**
Other residents												
Cetti's Warbler*	↑↑↑	11	154	23	-4	-	-	↓↓	28	-	-10	**103**
Treecreeper*	↑↑	**29**	23	33	42	-	-	↓	1	-9	11	-17
Wren	↑↑	8	**32**	1	3	↑	**-32**	↓	**-11**	**-37**	-4	1
Blackbird	↓	2	11	-2	4	↑	-7	↓	0	-8	-11	21
Song Thrush	↓	6	17	4	-4	↑	24	↓	11	**53**	5	-3
Robin	↑↑	**16**	**18**	**17**	8	↓	**-26**	↓	**-10**	-13	**-19**	14
Dunnock	↓	0	3	0	-5	↑	**-20**	↓	3	5	-5	19
Chaffinch	↓	**-44**	**-37**	**-50**	**-59**	↓	**-37**	↑↑	**65**	**101**	-17	30
Bullfinch	↓	**14**	**26**	13	3	↓	-12	↑↑	**18**	**32**	11	-2
Greenfinch	↓↓	**-52**	**-58**	**-46**	**-56**	↑↑↑	6	↓↓↓	**68**	**135**	52	**35**
Goldfinch	↑↑↑	-7	-7	-5	-10	–	-	↓↓	17	**65**	-19	48
Reed Bunting	↓↓↓	-7	-10	-8	-1	↑	-4	↓↓↓	-7	-35	-19	**42**

rise in numbers of almost 300% in the last 35 years.

Migrant species monitored through RAS also exhibited mixed fortunes in 2017. The apparent survival rates for House Martin and Swallow increased in 2017; results for both species have fluctuated over the past few years, although the long-term trends (1994–2017 and 1998–2017 respectively) remain reasonably stable. Conversely, both Sand Martin and Swift survival rates fell in 2017. The decline in Sand Martin survival rates was minor, and had little impact on the stable long-term (1990–2017) trend, whereas the decline for Swift was more dramatic. Swift survival rates are now far lower than they have been in previous years, though as only one site currently contributes to the trend we cannot assume this reflects the national situation. Pied Flycatcher, Whinchat and Wheatear survival rates all increased slightly in 2017, with a greater increase exhibited by Tree Pipit; the long-term trends are relatively stable for all but Tree Pipit, for which survival rates have increased since 2012. In contrast, results for Nightingale suggest a considerable drop in survival rates in 2017, with the trend now at its lowest point since RAS monitoring began on this species in 2011.

Migrant productivity

Results from NRS indicate that it was a significantly early breeding season in 2017 for most migrant species (Table 2). Sand Martin laid 12 days earlier than the five-year mean. An increase in clutch and brood sizes appeared to

Swallow, by Mary Michael Patterson/BTO

Fewer Swallows fledged per breeding attempt in 2017 than in any previous year since NRS monitoring began.

compensate for low egg-stage survival, possibly resulting from the wet summer conditions and the number of fledglings per breeding attempt (FPBA) was close to the average. Swallow was one of the migrants hit hardest in 2017; despite laying five days earlier in 2017 and recording a significant increase in clutch size, it exhibited the highest chick-stage failure rate and the lowest FPBA since NRS recording began; again, wet weather is likely to have contributed to this poor performance.

Chiffchaff and Reed Warbler, the two migrants to be recorded in significantly higher numbers than normal through CES, both laid 10 days earlier than the five-year mean; for both, this was the earliest average laying date recorded. BirdTrack data confirm that arrival dates for both species were also earlier in 2017 than the historical average. Spotted Flycatcher, Pied Flycatcher and Blackcap also registered laying dates earlier than average in 2017 but none of these warbler and flycatcher species exhibited a significant change in FPBA. Indeed, CES results indicate that it was a relatively average year for productivity, with only three migrants displaying a significant change. Productivity was increased for Blackcap and Garden Warbler; as numbers of both of these species were significantly reduced in 2017, it is possible that the increase in productivity was a result of density dependence, where fewer birds competing for resources results in increased breeding success. Blackcap productivity was especially high in the west of Britain. By contrast, Willow Warbler productivity fell in 2017; NRS data show that this species experienced significantly reduced clutch and brood sizes during the 2017 season.

PASSERINES AND NEAR-PASSERINES

Resident abundance and survival

Although the winter of 2016/17 was, for the most part, dry and mild, more resident species exhibited significant declines than increases in abundance in 2017 (Table 1). Fewer adult Chaffinches and Greenfinches were recorded by CES participants in 2017 than in any previous year, with Chaffinch also recording its lowest survival rate since CES began; the productivity declines exhibited by both during the previous season may have contributed further. The long-term trends for these finches are also indicative of significant declines, mirroring the dramatic declines shown

Some comments that accompanied CES submissions illustrate that it was a mixed breeding season across the country:

"Thankfully, it's been one of the better years, just creeping into the top 10 out of 30. Good numbers of adults and breeding success was quite good. Plenty of tits around, Dunnocks look like posting a record year but not so good for Robins and Bullfinches – both well down on numbers. Willow Tits have never come back after being wiped out by the winter of 2012/13 which is a shame. Some nice species in there such as the Nuthatch and Lesser Pecker." **Dave Hazard**, South Yorkshire

"The year started so well but went downhill from June when bad wet spells probably accounted for many nests and young. Generally, migrant species seem to have done even worse than last year." **David Leat**, Northumberland

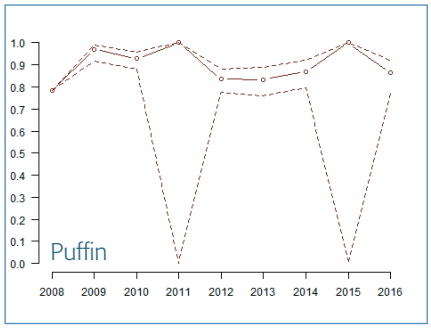
"The year started slowly with low numbers of adults but it has picked up as the year went on and we have finished with equal second highest in last 25 years. Especially high numbers of juvenile Chiffchaffs and Willow Warblers, but Reed Warblers and Sedge Warblers down." **Lynne Lambert**, Hertfordshire

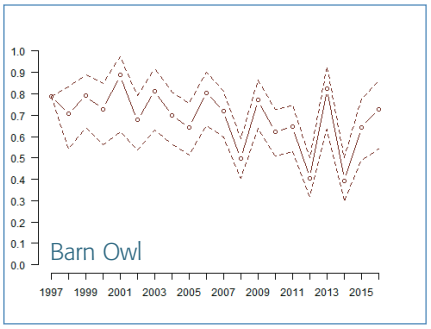
"We had a reasonably good year but we missed two visits due to inclement weather. Most resident species seem to have done particularly well but warblers appear to have been less successful. The highlight of the year was retrapping a Cuckoo that we ringed during a CES visit in 2013. Although there were still four pairs of Turtle Doves breeding within our ringing area, we failed to catch any this year." **Simon Lane**, Hampshire

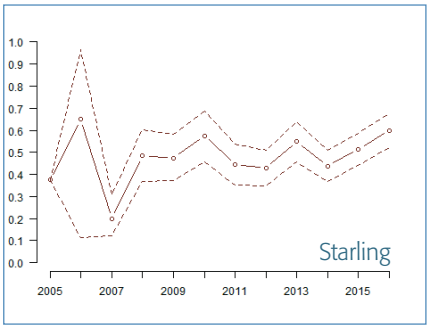
Table 2. Laying dates and breeding success calculated from 2017 NRS data. Laying dates are given as the number of days **earlier** or **later** than the five-year mean (2012–16); productivity figures represent a percentage change relative to the five-year mean. Statistically significant 'positive' and 'negative' changes are highlighted in **blue** and **red** respectively. '*' denotes small sample size (<25 records).

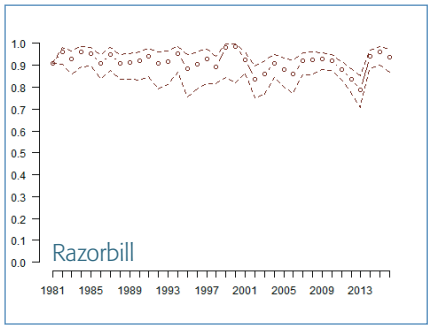
Species	Laying date (days)	Clutch size (%)	Brood size (%)	Egg-stage survival (%)	Chick-stage survival (%)	Fledglings produced (%)
Migrants						
Sand Martin	**-12.0**	**3.6**	**5.9**	**-4.3**	-1.6	-0.3
Swallow	**-4.8**	**1.6**	-0.7	-1.1	**-11.0**	**-12.6**
Chiffchaff	**-9.5**	3.6	5.2	3.1	3.9	12.7
Willow Warbler	-1.1	**-6.3**	**-4.4**	11.5	-5.0	1.2
Blackcap	**-5.6**	-0.8	-1.1	3.3	-15.9	-14.1
Reed Warbler	**-9.5**	1.9	2.0	-2.1	-0.9	-1.1
Spotted Flycatcher	**-6.0**	-2.3	2.9	3.6	-8.5	-2.4
Pied Flycatcher	**-4.8**	**4.8**	**4.3**	1.6	-3.5	2.1
Redstart	-1.6	**4.5**	**7.8**	6.5	-11.0	2.3
Tits						
Blue Tit	**-10.4**	**5.7**	**6.9**	**1.3**	3.2	**11.9**
Great Tit	**-8.6**	**2.4**	**5.0**	**1.2**	4.0	**10.5**
Long-tailed Tit	**-5.2**	-1.1	-8.5	2.5	5.6	-0.9
Other resident passerines						
Jackdaw	**-2.6**	**5.2**	-1.0	1.3	4.5	4.8
Nuthatch	**-4.3**	2.4	3.8	0.0	1.8	5.6
Wren	-1.8	**-4.8**	-2.5	2.0	-0.7	-1.3
Starling	2.4	**-7.4**	4.4	0.8	3.3	8.7
Dipper	-2.8	-1.9	**-4.9**	-1.4	8.1	1.3
Blackbird	**-8.3**	**-4.7**	**-3.2**	-5.8	-2.5	-11.1
Song Thrush	**-9.8**	**-2.8**	**-3.1**	-3.9	1.1	-5.8
Robin	**-4.3**	-1.9	-2.1	3.5	-3.9	-2.6
Stonechat	-5.0	-1.0	0.3	-4.3	-3.7	-7.5
Dunnock	-4.4	-3.2	3.4	-0.1	20.1	24.2
House Sparrow	-0.9	-0.4	2.5	-1.5	1.6	2.5
Tree Sparrow	**-2.6**	0.9	0.5	0.1	-4.2	-3.7
Grey Wagtail	-3.2	-2.8	2.2	-4.9	-8.5	-11.1
Pied Wagtail	-3.6	-0.7	-0.4	-6.1	2.4	-4.3
Meadow Pipit	-2.8	0.9	-3.1	-25.2	-19.8	**-41.8**
Chaffinch	-3.0	-2.5	-1.0	3.7	2.5	5.2
Linnet	**-7.7**	-1.0	-3.0	-9.6	0.4	-12.1
Resident non-passerines						
Stock Dove	0.6	**3.7**	-0.5	-1.1	6.2	4.4
Woodpigeon	**-8.5**	1.6	1.9	-17.1	7.6	-9.0
Owls and raptors						
Barn Owl	**-19.4**	2.9	**-3.6**	-0.6	0.2	-4.0
Little Owl	**-6.2***	4.8	1.3	-4.6	11.6	7.9
Tawny Owl	-3.2*	-4.2	-0.9	4.4	0.8	4.3
Kestrel	-4.1	2.8	**4.5**	2.7	1.8	9.2
Waterbirds						
Moorhen	**-9.1**	-0.8	3.5	-10.3	-34.2	-38.9
Coot	-4.6	**-10.2**	4.3	**-39.6**	8.0	-32.0

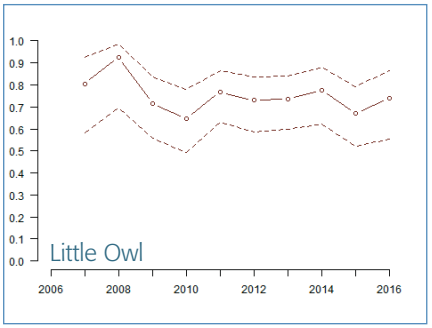
Kittiwakes, by Jill Pakenham/BTO; Barn Owl, by Robin Lee/BTO; Linnet, by Allan Drewitt/BTO

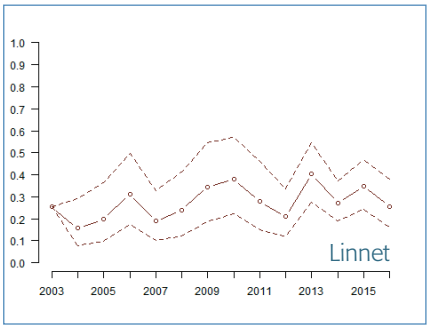


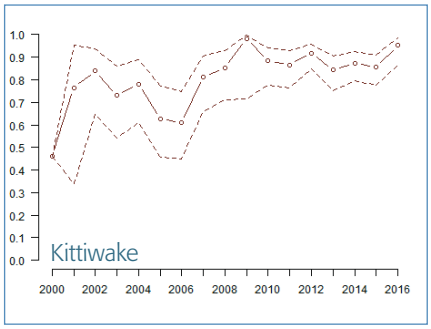


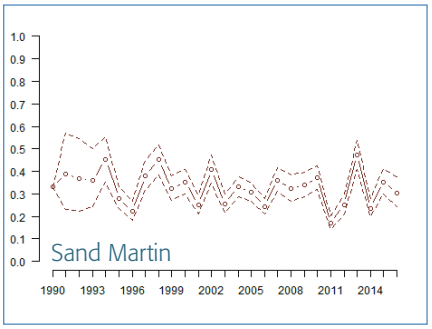












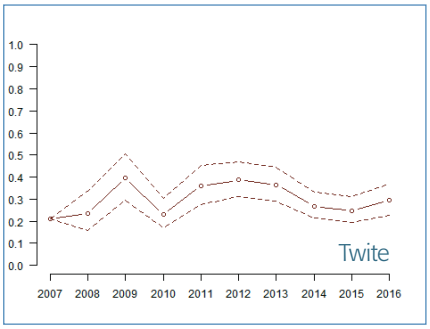


Figure 1. RAS survival trends. Survival is measured from the year indicated on the graph to the following year: i.e. the figure for 2016 is the survival rate from 2016 to 2017. The dotted lines show the upper and lower 95% confidence limits about the modelled estimate.

RAS ringers also had a mixed year in 2017:

"It turned out to be an epic RAS season for me, with a big increase in the number of adult and juvenile Starlings. The dry spring almost certainly played a big part in the increase, with natural food being harder to come by. I had over 75 different adults in the garden on 15 May alone, with 69 being colour-ringed birds and just six new adults." **Peter Alker**, Starling RAS, Greater Manchester

"Good season here. I caught 98% of the parents of individual nests and, since many were double-brooded, I rather think that literally only one or two adults escaped without being captured at all; maybe none. Not that I'm addicted, or anything!" **Tony Martin**, Sand Martin RAS, Cambridgeshire

"On some days I have a Potter trap permanently set in my garden. Result this year: c. 100 Starlings, more tits and Dunnocks than you can shake a stick at, but no sparrows." **Ray Morris**, House Sparrow RAS, Kent

"A very poor year, with very few birds locally, which seemed to fledge very few nestlings. I have had one bird reported shot locally, which I'm hoping is an isolated incident. On a positive note, it does seem that nearly all the adult Starlings on the small estate where I live have blue darvic rings on." **Derek Gruar**, Starling RAS, Bedfordshire

"My Swallow population is only just recovering from two to three years of intense predation by Magpies (with assistance from the odd mouse!); ironically their saviours are three new cats on the yard...!" **Richard Facey**, Swallow RAS, Glamorgan

through BBS monitoring since the mid-2000s that have been largely attributed to the persistent impacts of finch trichomonosis.

Numbers of Blue and Great Tits were significantly lower in 2017, most notably in the south. This again could be a legacy of poor breeding performance in 2016, although it is possible that the frosts in the second half of April reduced the food available for tits. Blue Tits and Chaffinch populations may also have been affected by high overwinter mortality, with both exhibiting a significant decline in their survival rate in 2017.

Treecreeper, Robin and Bullfinch, alongside Chiffchaff, emerged as winners from 2017, all increasing significantly in abundance; Treecreeper numbers are now at their highest since CES began. Given that 2016 was a poor breeding season for Robin and an indifferent one for Treecreeper and Bullfinch, and that adult survival was generally below average, improved first-year survival is the most likely explanation for these observations.

RAS results demonstrate a large increase in the survival rate for Dipper in 2017, with the rate now as high as it has been since monitoring began in 2002, but a large decline for Hawfinch, with the rate now at its lowest point. For the third year in a row, the House Sparrow survival rate increased, whilst Starling rates increased for the second consecutive season. Following a period of decline, the addition of data from a second RAS project led to a small increase in the Twite survival rate in 2017, and the long-term trend remains stable. Jackdaw and Linnet survival rates exhibited a small decline in 2017; however, again, the long-term trends for both species are stable. Despite a decline in 2017, the long-term results show an increase in the survival rate for Stonechat.

Resident productivity

As was the case for migrants, laying dates were significantly earlier for many resident species; those for Song Thrush and Blue Tit representing the earliest on record for these species (Table 2). Advanced laying may have contributed to the successful breeding season experienced by both Blue Tit and Great Tit, which fared particularly well in the west, driven by increases in clutch sizes and reduced egg-stage failure rates. Long-tailed Tits also bred significantly earlier than average, and CES results indicate an increase in productivity for this species too. CES data are indicative of significant increases in productivity for Chaffinch, Greenfinch and Bullfinch, all driven by results in the north. Both Chaffinch and Greenfinch were recorded in lower numbers than ever before, suggesting that density-dependent factors might be the mechanism underpinning increases in breeding success; Bullfinch, however, was recorded in significantly higher numbers in 2017.

Although a number of resident species exhibited significant declines in clutch and brood size, the only species to record a significant reduction in FPBA was Meadow Pipit, for which productivity was the lowest on record. Robin and Wren productivity also fell in 2017; NRS data indicate that the average clutch sizes of the latter hit an all-time low.

Great Tit, by Sarah Kelman/BTO

Great Tits (and Blue Tits) had a successful breeding season in 2017.

Many NRS participants reported a rain-affected season in 2017:

"For my Blue and Great Tit boxes productivity was the highest ever for pulli ringed and after fledging the trees were full of roving tit flocks. However the flocks soon thinned out and were few and far between by mid-summer. At the end of 2017 my retraps of fledged Blue Tit pulli was 16 individuals from 132 pulli ringed – the lowest return at 12% for the past eight years." **Phil Deacon**, Wiltshire

"A lot of heavy rain caused most of the Red-throated Diver nests to be flooded. Only those on lochs with relatively small catchment areas and/or good outflows survived. A number relaid, but the chicks disappeared soon after hatching: lack of small sandeels?" **Chris Reynolds**, Isle of Lewis

"This has been the most productive year for the Blue and Great Tits since I started monitoring the nest boxes in 2007. The large nest boxes have also been successful, particularly for the Tawny Owls, Kestrels and Stock Doves." **Ian Wrisdale**, Northamptonshire

"It was a poor breeding season in West Lothian, hampered by bad weather and a lack of insects." **Chris Laurie**, West Lothian

"A very mixed year for me here in Northumberland (and not good in Mid Wales, where Pied Flycatcher chicks were dying as I visited nests in early June due to prolonged – ie 36–48 hours continuous – heavy rain). Similar continuous and heavy rain here in early and late June saw many first-brood Swallows desert and their second attempts also failed three weeks later." **Peter Rose**, Northumberland and Wales

OWLS AND RAPTORS

After a disastrous breeding season in 2016, Tawny Owls bounced back in 2017. The RAS trend shows that the apparent decline in survival rate calculated through RAS from 2015 to 2016 was far less severe than was indicated in the 2016 results, a result of birds not being detected because they had suspended breeding; re-encounter of these birds in 2017 allows the 2016 figures to be adjusted. The much-improved breeding season in 2017 led to an increase in the apparent survival rate, which is now as high as it has ever been. This trend is calculated from a single project, so does not necessarily reflect the national picture.

The survival rate for Barn Owl and Little Owl also increased in 2017. NRS data indicate that the laying dates for both species were significantly early compared to the five-year mean (Table 2) but that Barn Owl brood sizes were significantly reduced; neither exhibited a reduction in FPBA, however. Kestrel brood size increased in 2017, as did both brood and clutch size of Peregrine although, again, FPBA was average for both species.

SEABIRDS AND WATERBIRDS

RAS trends were produced for eight seabird species in 2017. The apparent survival rate for Kittiwake continued to show a decline and it is now at its lowest point for 10 years. The survival rate for Eider increased slightly in 2017, though note that results for the past 10 years are generated from a single east-coast population and may not reflect the national situation. The Puffin survival rate remained constant between 2016 and 2017, although the long-term trend is suggestive of a slight decline, while survival rates of Guillemot, Razorbill and Shag all declined. The Guillemot and Razorbill trends are generated solely from west-coast projects, and both species are also demonstrating a slight long-term decline in survival. The Shag trend combines historical data from two east-coast projects with one from the west coast; the long-term trend for this species is stable.

Arctic Tern, by Jamie MacArthur/BTO

A RAS trend for Arctic Tern was produced for the first time in 2017.

Although there are now four RAS projects on Mute Swan, only one has been running long enough to contribute to the results and a trend was produced for the first time in 2017; while there was a slight decline in the survival rate in 2017, the long-term trend is stable. A trend was also produced for Arctic Tern for the first time in 2017 and the results show a decline in survival between 2016 and 2017, possibly caused by an outbreak of botulism in the only colony contributing during the 2016 summer.

The detail in this overview and the accompanying tables demonstrates the incredible amount of information supplied by nest recorders and ringers, monitoring changes in fortunes of bird populations over time and, vitally, identifying the causes. As ever, we'd be very pleased to hear from anyone wanting to participate; email **ces@bto.org**, **ras@bto.org** and **nrs@bto.org** respectively for more information.

Further results from the 2017 season can be viewed on the BirdTrends website: **www.bto.org/birdtrends**

The full suite of 2017 RAS results can be found at **www.bto.org/ras-results**

First come, best served?

For migratory birds, the timing of key life-history events is associated with the distance individuals must travel to reach their spring breeding grounds. Long-distance migrants tend to arrive at their spring breeding grounds later than species that make shorter migratory journeys, and these differences in timing of arrival could have important consequences. These potential consequences became the subject of Jenny Donelan's MSc study at UEA.

Chiffchaff, colour-ringed Chiffchaff, by Alex Berryman

Birds were caught using a mist net set along a woodland path in the bird's territory; sound lures were used for 10 minutes to catch the males, while females were caught by chance.

During the spring and summer of 2017, I undertook fieldwork for my MSc dissertation project to investigate the consequences of spring arrival dates for the breeding phenology of migratory warblers. I asked myself, do individuals arriving early breed earlier? Do they gain access to higher-quality breeding territories? And, if first nesting attempts are unsuccessful, are early arrivals more likely to re-nest?

My study focused on Chiffchaffs (short-distance migrants) and Willow Warblers (long-distance migrants). Chiffchaffs and Willow Warblers are closely related and share extremely similar nesting behaviour and habitat usage. These two species therefore provide an ideal system to measure and compare the consequences of different migratory strategies. Specifically, I assessed whether the spring arrival dates of the two species influenced habitat occupancy, pairing and nesting dates.

Over a period of four months (March to June) I surveyed the Norfolk Wildlife Trust's Foxley Wood Nature Reserve for newly arrived Chiffchaffs and Willow Warblers. I walked along pre-defined woodland paths for a minimum of five hours a day for six days a week, listening for the songs of males and calls of females. It was important that I standardised my sampling effort because this would allow me to pick up any patterns occurring in the woodland that season, and over subsequent seasons if I or anyone else were to continue the project using the same methodology.

Once a new bird was found, I recorded the exact location of that individual and their date of arrival, and attempted to catch and colour ring them. Colour-ringing allowed me to know precisely which individuals arrived when, and allowed me to relate arrival date to habitat occupancy and the timing of pairing and nesting; it also allowed me to monitor the movement of individuals across the woodland.

I collected pairing data by following colour-ringed males and classing an individual as paired once I had observed them mate-guarding a female. I subsequently monitored paired birds to determine when females began nesting. I attempted to find nests before, or during, egg laying as this allowed me to calculate the precise clutch initiation dates for these nests and relate this to individual arrival dates.

I found most nests by watching females pick up feathers (they stand out well when flying with a big feather in their beak!) and following them back to the nest. Females are very vocal when collecting feathers, which helped a lot. Once a nest was found I recorded its progress and the bird's subsequent nesting attempts.

The findings showed that, in general, i) early-arriving males occupy specific habitats within the woodland, which may reflect territory quality, and ii) early-arriving individuals do pair and nest before later-arriving individuals. This is likely to mean that should those early pairs fail, they should have more time to re-nest, while late-arriving birds may not have this option. My project therefore provides an example of the value that systematic recording of the number and location of individuals as they take up territories can add to a traditional colour-ringing and nest-monitoring study. These findings are currently being prepared for publication.

I would like to thank the Norfolk Wildlife Trust, all the volunteers that helped me during fieldwork and my university supervisory team, Prof Jenny Gill, Dr Catriona Morrison and Dr Iain Barr for their advice and guidance throughout.

Swallow, by Liz Cutting/BTO

"Retrapping 'my' adults fresh back from Africa has been a real highlight for me". Michael Miles

Swallow survival: plugging a gap

One of our most-ringed migrants, the Swallow, is a familiar bird whose appearance heralds the start of summer to many people in Britain & Ireland. In this article Declan Manley, Michael Miles, Geoff Myers, Hugh Pulsford and Jan Riley share their knowledge and expertise on ringing and nest recording this iconic species.

Swallows are one of the few long-distance migrants to display a positive population trajectory, with numbers increasing by 50% between the mid-1980s and 2010, resulting in the species' removal from the UK Birds of Conservation Concern Amber List. The last five years have witnessed a change in fortunes, however, with numbers dropping sharply. The species is well covered by the Nest Record Scheme, with between 2,500 and 3,000 nests monitored annually; analyses suggest that productivity has been stable over this period. The ringing totals are equally impressive, amounting to c. 40,000 individuals a year, but fewer than 10% are adults and over half of those are caught at roost away from the breeding grounds.

As the BTO Swallow Roost Survey showed, roost catches can be useful to explore elements of Swallow ecology, such as fattening strategies (Coiffait et al. 2011), but they are of limited use in generating survival data. Figures from one of the authors of this article show that 24 retraps and 36 controls have been generated from 8,301 Swallow captures at roost, compared to 36 retraps from 83 encounters of breeding birds. Our knowledge of Swallow survival trends is therefore limited. Five RAS projects are currently helping to plug this gap (one in the Republic of Ireland, one in Wales, one in western England and two in northern England). These, together with three historic studies, enable us to produce reasonably robust survival figures back to the late 1990s but more data would be very welcome, particularly given the recent declines; email **ras@bto.org** if you think you could help.

SELECTING A STUDY SITE

Swallow breeding populations tend to be aggregated, as suitable nesting habitat is limited. Farm buildings typically form good focal areas but it is unlikely you'll find a complex big enough to support a breeding population large enough to meet the RAS criteria (obtaining 30 adult–adult recaptures per year). The key to site selection is to choose areas that are self-contained, encompassing all the suitable locations in the immediate vicinity. In this way, you maximise the chance that a bird not encountered in a given year is dead, rather than merrily raising a brood on a barn next door that you don't have access to, which in

REFERENCE

Coiffait, L. et al. (2011) Fattening strategies of British & Irish Barn Swallows *Hirundo rustica* prior to autumn migration. *Ringing & Migration* **26**, 15–23.

turn increases the accuracy of the survival rate generated using your data. Combining multiple self-contained sites under the banner of a single RAS is not a problem, but the closer they are to each other the better (close enough to exchange birds between seasons would be the ideal) as the environmental pressures, such as weather and food availability, faced by each group of birds are therefore likely to be similar.

CATCHING FREE-FLYING BIRDS

One of the best times within the nesting cycle to catch adult Swallows is when they are feeding chicks, as both birds are at their most active; males are less frequently encountered when the females are incubating as they tend to stay outside, but both sexes can also be caught safely at this stage. Ringing adults throughout the nesting cycle extends the catching period, however, providing more opportunities to catch as many of the adults as possible. It is possible that both parents will roost near the nest, so setting a net outside at dawn often works well, but Swallows can be caught at any time of day; if they have small chicks, starting after 10 am will ensure that their offspring have been well fed. Mist nets work well to catch both adult birds and fledglings. To identify the ideal positioning, watch the birds' flight lines as they move in and out of the buildings as these tend to be very repeatable. You may need to set up inside sheds or stables, so multiple short mist nets may be of more use than a few longer ones.

Attaching guys can be tricky, but sometimes the poles can be jammed against the rafters or roof. Alternatively, if the farmer allows, screwing cup hooks into walls or posts works well. If there is no other option, heavy artefacts such as troughs or pallets, are useful to guy to or to prop against the pole. If you can, leave a helper outside while you are setting nets, standing a distance away but near enough to stop the birds going in while you set; if it is possible to position the net without the birds knowing you have been inside the building, they often go straight in without looking.

If setting outside the building, leave a gap of about one metre at one side; the birds soon find the way in and tend to get caught on the way out, although occasionally, they fly straight into the net, even though they can see it. Trapping can be particularly effective as birds exit from doorways or windows, and a hand-held net may present an easier option in some situations (this approach can work well on stable doors when the bottom door is closed, for example).

Mist nets should always be set with plenty of bag as Swallows get up quite a speed and tend to bounce out of a very taut net. They are famously easy to extract, having short legs that they hold close to the body when captured, typically lying motionless in the shelf. Patience is required to catch Swallows as it can take time; however, they are a very tolerant species and are not easily disturbed, as one might expect from a bird that frequently nests close to humans. If birds are trying to get back to the nest, but are put off by the net, it is best to take it down after 20–30 minutes to allow the chicks to be fed.

PULLUS RINGING AND NEST RECORDING

Ringing pulli can easily be combined with catching adults and if both are undertaken simultaneously you maximise the chances to collect valuable data on site fidelity and recruitment. A good-quality ladder is invaluable when ringing but a mirror on the

TOP TIP

Including dog biscuits in your ringing kit will enable you to befriend most farm dogs!

Swallow nest with large chicks, by Eric Wood

When approaching a nest for the first time, if the chicks are peering over the rim, they are too big to ring and should be left alone.

Swallow chick, by Jan Riley; artificial nest cups, by Hugh Pulsford

Artificial nest cups can be made by moulding a mixture of fine sawdust and cement powder, mixed in an approximately 50:50 ratio, with water added until it is the consistency of bread dough, over the inside of a half-sphere of c. 18 cm in diameter (plastic hamster balls work well, apparently!). Apply a thin layer of Vaseline, and then add a layer of the nest mixture 1.5 cm thick. Once dried, the mould can be removed and the artificial cup sawn in half to make two nests.

end of a telescopic pole, or a mobile phone on the end of a long 'selfie stick', can be a great help when wanting to examine nest contents at earlier stages of the nesting cycle.

As with most passerines, the optimal time for ringing is when the flight feathers are just starting to emerge from the pin (the first day they would be coded as 'Feathers Short' (FS) on a nest record); in Swallows this typically occurs at eight or nine days old. They are easy to handle at this stage and there is still plenty of space in the nest cup, which makes them easy to extract and place back inside with no risk of forced fledging. Swallow pulli are very tolerant, however, and can be ringed as soon as the leg is sufficiently developed to stop the ring sliding off the tarsus right up to the latter stages of 'Feathers Medium' (FM) (generally 5 days and 13 days old respectively, though be aware that growth rates vary according to weather conditions, availability of food and degree of sibling competition and judgement should always be based on the visual evidence at the nest). This flexibility can be very useful when visiting large colonies as breeding attempts may not be synchronous.

Large chicks will sometimes leave the nest if approached, but they rarely exit the building and, if flying, will return when left alone. If you find yourself in the position of ringing larger chicks, which can happen occasionally as the age can be difficult to estimate prior to handling if the cup is part obscured, it is best to put them all back in the nest simultaneously, heads down, facing towards the wall. Put a bag over the top of them and gently hold it down for several minutes until they settle.

Swallows typically have two broods, but the adults move to a different nest, invariably an existing old one, usually within a few feet of the first; very occasionally, the same nest is used twice. Refurbishment of an existing nest, if carried out at all, is generally limited to the addition of 10–15 mm of fresh mud to the top of the nest wall. Young that fall out of nests can be replaced; if it is unclear which nest it has fallen from, relocating it to a nest containing pulli of a similar age and size is usually successful.

HORSE HAIR

If nests are located in areas with horses, one hazard to be aware of is horse hair, which can be used in place of the more typical grass and feather lining. As the chicks grow, they can become hopelessly tangled in it, making it tricky to remove them to ring and impossible for them to fledge without human intervention.

ARTIFICIAL NEST CUPS

Occasionally, Swallow nests can be positioned in inconvenient places, such as above a water trough or over expensive equipment that can be damaged by their droppings. It might be possible to encourage these birds to relocate by placing an artificial nest cup in a more suitable part of the building. Attach the cup to a back board using exterior glue and drill the board in position. Most Swallows will add a further thin layer of mud to the inside of the cup before lining the nest. Another benefit of artificial nests is that they are slightly larger than natural ones and won't disintegrate whilst holding five large pulli!

Scottish moors, by Jonathan Groom

Whilst it was great to find the nests of some quite scarce species on the Scottish moors, the significance of how rare nest records are for some of these species was sadly lost on me at the time.

Novice to mentor: a nester's journey

Jonathan Groom has been passionate about wildlife and birding for as long as he can remember, particularly surveying and monitoring. He developed this interest after undertaking Bird Atlas surveys, knowing that his records contributed to large-scale research projects. Here, Jonathan explains how he got involved in the Nest Record Scheme and why he finds contributing to NRS, and mentoring others, challenging, thrilling and hugely interesting.

I was first introduced to the Nest Record Scheme during 2011 and joined up in 2013. I would consider myself to be self-taught, in that I was never really formally introduced to the scheme. I was given a fantastic career opportunity to carry out field research in Scotland that sparked the interest and showed me a side to birding that I had not experienced before. I was then able to fill in the gaps myself with guidance from the various fantastic resources that are now readily available to all nest recorders. I have also been able to share my passion, and what knowledge I have accumulated, with a few others during the last couple of years as a mentor, and it has been an amazing feeling to see how they have grown to love it too. One of them has now become my nest-recording colleague, and together we inspire and support each other through each season, making the whole experience even better and highlighting how important this individual support is to NRS.

MADE ON THE MOORS

It all began back in the mists of time during 2011. OK, that's not so long ago really, but it certainly feels like it when I think how much has changed since then. My work in Scotland (with another well-known ornithological charity) involved finding Golden Plover nests; as a result of tramping remote Scottish moors, my first three self-found nests were Red Grouse, Meadow Pipit and yes, a Golden Plover (I can't quite remember what order they were). This was followed by Teal, Hen Harrier (which was passed to a Raptor Study Group for monitoring) and Willow Warbler.

One of my colleagues encouraged us to collect grid references as they were completing nest record cards. This planted the seeds in my mind and eventually, during another season of Scottish fieldwork in 2013, I signed up for NRS myself. I got a copy of BTO's landmark publication, *A Field Guide to Monitoring Nests*, the content of which I devoured hungrily. I had grand ideas that year, but even though you can read all you like, sometimes it just doesn't come to you all that quickly. I remember trying to tap for Whinchat and being soundly defeated. I saw the fledglings later on and realised that I had been way off! This has remained a 'bogey' nest for me

ever since. But being in Scotland, my luck did continue and I managed to record Snipe, Lapwing, Common Sandpiper, Pied Wagtail, Swallow and of course, more Meadow Pipits. I realise now just how fortunate I am to have found some of these, and it was really quite a strange start to my nesting journey, as I had still yet to record the 'basics' such as Robin, Blackbird, Wren or Song Thrush.

BACK TO BASICS

My journey then took me to the somewhat less wild lands of the West Midlands in 2014, where I settled with a new job in Shropshire. I was determined to continue nesting, as well as signing up for local BBS, WBBS and WeBS surveys.

It was a slow start for me as I was still exploring my new surroundings, but I finally managed to connect with the commoner species and even found a great spot for Linnets, which allowed me to practice my tapping skills on something a little more straightforward than Whinchat. I also discovered the Nest Record Forum, an excellent resource for learning from knowledgeable members of the scheme, a way to share your experiences and read about the adventures of others.

Through my new job I befriended a chap called Dave, with whom I would take every opportunity to talk birds. I subsequently invited him to join me nesting in 2015. I was well prepared and got started early with a couple of new species for me, Long-tailed Tit and Magpie, for which I enlisted Dave's help to check the nests.

Dave has a massive sense of enthusiasm and delight in discovering and learning new things. One of his earliest nesting experiences was helping me check a Magpie nest, by lugging a heavy wooden ladder some distance along a footpath, followed by some precarious balancing and leaning with a mirror on a stick to get some pretty sketchy views! We also found a Long-tailed Tit nest suspended in brambles over a steep stream bank, which we somehow managed to access by forming a two-man human chain along the edge of the bank, and inserting a 'pre-historic', non-digital endoscope that I borrowed from work into the nest (I of course fell in the stream on one visit, much to both our amusements). Despite this rather unorthodox start, in Dave's own words: "*a bit of precarious balancing just to get a glimpse of the eggs. That rush of adrenaline and I was hooked!*" To this day, this remains his favourite nest.

I certainly didn't waste any time in 2015 as I also helped with a project which set up a successful Pied Flycatcher nest box scheme and started checking some Barn Owl nest

Golden Plover nest, by Jonathan Groom

boxes for a local group. Dave and I ended up having a respectable year, with around 50 nests each, in addition to the nest boxes. Dave proved to be a natural nester, putting in the hours and establishing his own very productive site on family-owned land on the Welsh border with some lovely wooded hillsides. We continued to learn a lot together and during the next two years threw ourselves wholeheartedly into nest recording. We improved our 'tech', purchasing proper endoscopes, a range of mirrors of all shapes and sizes, extendable poles and biodegradable marking tape, and I even printed us bespoke notebooks with nest record cards on each page.

We came close to 100 nests each in 2016 and then both achieved that milestone in 2017. We hit our 606th nest and 57th species between us by the end of 2017, including such 'goodies' as Willow Tit, Spotted Flycatcher and Wood Warbler. We also teamed up to help mentor two volunteers who took on the monitoring of the Pied Flycatchers from 2015 and they are working up from checking nest boxes to becoming full nesters as well!

MENTORING

So why be a mentor? I think, purely in terms of looking at the data, even just one new NRS member can make a huge contribution. Looking at the online NRS report, I can see that 850 nest records were submitted for Shropshire in 2016. One extra person could easily contribute 50 more records, which is a substantial increase. If they were to concentrate on a species that receives few annual records, then huge differences can be made. Some of these species are actually quite common, for example only 22 Goldcrest nest records and 49 Treecreeper nest records were received in 2016 for the whole of the UK.

Having a mentor also makes a huge difference to how quickly a new starter can get up to speed. As my own example illustrates, even though there is a wealth of knowledge available to read, this only takes you so far. Going out with an experienced nester will quickly help to show new nesters the best areas to start looking in, practical demonstrations of techniques and the right sort of gear to use. There is also the fact that many people, quite rightly, would be nervous about approaching nests and causing the birds to desert. As nesters, we know that when it's done properly, the risks are minimal; and just providing that reassurance and reminders on the NRS Code of Conduct will again be of great help for the new starters.

Perhaps the biggest take-away from our nest recording is that Dave and I both felt that it has increased our understanding of birds enormously. Not just what they look and sound like, but how they behave, what different calls mean and how they use the structure and features of their habitat. It also makes common birds like Wrens and Blackbirds, likely often overlooked by many, interesting and exciting again.

I can't recommend being a mentor enough, not just because you're helping to collect more data for NRS, or because you're introducing people to a fantastic new experience, but also because you'll get such a great deal of satisfaction from it yourself. There's nothing quite like seeing the excitement of someone finding their first nest, or seeing someone develop into a keen nest recorder and sharing the stories and adventures of the season with them. As I write this article, the start of the 2018 season is rapidly approaching and I genuinely can't wait!

Stonechat nest, by Jonathan Groom

Our first Stonechat nest – the result of patience, teamwork and expert advice.

STONECHATS

The 2017 season culminated in Dave and me staking out a Stonechat pair and using patience and teamwork (and the expert advice of a prominent member of the Nest Record Forum) finally tracking it down to find our first nest for the species. It was a 'high five' moment, and one which we will no doubt always remember (though I still haven't forgotten about those Whinchats!!).

Corn Bunting fledgling in oats, by Matt York

Fledglings can be difficult to spot in crops during their first week out of the nest.

Living on the edge

Nest recording is a powerful demographic tool. It provides a direct measure of breeding success which, along with dispersal and survival, help to define population trends. In this article, Rosemary Setchfield, a Conservation Scientist at the RSPB, illustrates how nest record data can reveal important demographic processes that in turn inform conservation management.

So, you are a nest recorder? Maybe you are the competitive type, trying to find as many nests as you can each year? Or maybe you prefer to concentrate on a favourite species or patch. Have you ever thought about getting more out of your hard-earned data? Although an extreme example, I would like to show you how a project designed around nest record data provided important insights into processes affecting breeding success in Corn Buntings, which has helped to inform an effective conservation solution. OK, so we've chosen a difficult species, but the principles below can be applied to add value to projects on any species.

FINDING CORN BUNTING NESTS

Corn Bunting nests are reasonably hard to find, especially when they occur in the middle of cereal crops. The species is remarkably devious, unless you are lucky enough to catch a female nest-building. Flushing incubating females off nests is not a feasible method of finding nests within crops as they avoid tramlines (tractor wheel tracks). You invariably have to resort to triangulation, sometimes over large distances. This is a satisfying skill to master, particularly when pinpointing a nest first time. The key to good triangulation is patience and accuracy when making field sketches and setting markers.

First you require a friendly farmer who is happy for you to search for nests in his/her fields; always offer to provide them a summary report of your findings. Then, you invariably need several early mornings watching for evidence of nesting behaviour. In most years, we find females rarely lay their first egg before the second week of June. Nest-building is usually a week before that, and is often heralded by 'chipping' calls from the adults and intermittent, energetic sequences of song from the male.

Take all the usual precautions when visiting nests. Set your marker canes carefully along triangulation lines and use tramlines to make your way towards the nest area. The final push into the crop should be conducted with utmost caution. We take big, high strides, using bamboo canes for balance, to minimise potential crop disturbance cues for predators. Use the canes for parting vegetation, to ensure your next step is nest-free. Take special

NEST VISITS

Attempting to visit a nest within the first six days of nest-building is to be discouraged to ensure at least a partial clutch is present, minimising the risk of abandonment. If you miss nest-building, you may have to wait more than an hour between incubation breaks for a triangulation line, although the female will usually return within 20 minutes. Beware: return to incubation may be delayed or prevented if you are within 100 m of the nest site.

care around fledging, as well-camouflaged chicks crouch in the crop during their first week out of the nest.

COLLECTING DATA FOR EXTRA VALUE

We visited nests every three to five days, recording nest data. Through experience, we were able to judge brood age, allowing us to estimate hatching and first-egg dates (the incubation period usually lasts for 12 days, beginning with the penultimate egg). Nest data alone showed us that early nests were more likely to succeed than later nests, and that warm spring weather was linked to larger clutches and earlier breeding attempts.

One way to increase the value of your nest data is to monitor nests within territories across the whole breeding season. This can provide important, difficult-to-obtain data on multiple brooding attempts. If you are confident that you are watching the same female, record if a second clutch is laid, and follow it through until nest completion. So far we have found important patterns in the probability of females producing a second clutch, related to nest habitat quality and the date of first-nest completion.

Habitat information can also bolster the value of your nest records. Vegetation data can reveal what cues females are seeking for placing their nests. What to measure is a tricky one though. We recorded crop height, bare ground exposure and crop, grass and weed covers before finally finding that total cereal crop stems in a small area around the nest (25 x 25 cm) was important. This information is required from the nest site, as well as from the surrounding crop area for comparison. Of course, you can only take measurements after the chicks have fledged to avoid nest disturbance, and you have to work out how much data you need to collect (a friendly statistician is invaluable). And it is not just vegetation data that are useful. We recorded the distance between nests and the nearest crop edge, and found that nests closer to crop edges were more likely to be predated by mammals. Using the exact dates that clutches were laid also showed us that this effect intensified for late-season nests.

INFORMING CONSERVATION SOLUTIONS

This is the holy grail of conservation scientists: obtaining results that inform simple and cost-effective solutions for population recovery. Our data showed that females selected small crop areas for nesting that were especially dense in cereal stems and, because we also recorded nest distance from the nearest crop edge, we managed to discover a method for improving breeding success. Females selected nest sites close to crop edges (15–30 m), where the chance of nest survival was low, more often than expected by chance. No end of head-scratching suggested 'why' they chose these areas and I finally learnt it pays to ask a farmer: he told me that seed is overlapped in these areas during crop sowing. Eureka!

This fuelled an experiment confirming that double-density seed could attract nesting females away from low-survival areas to other parts of the crop. Importantly, our demographic data were used to build a population model showing that, if females were attracted to areas at least 100 m from crop edges using similar solutions, enough chicks would fledge to allow populations to increase.

TOWARDS NEST RECORD PROJECTS

If you have the time and enthusiasm, why not develop a nest recording project along these lines? Our results arose from a data set of c. 100 nests in each of several years, spread across a set of study sites. A single nest recorder might manage a single species at a single site over several years. A consortium of similar-minded individuals could multiply this effort at other sites and, 'bingo', you collect enough data for similar types of analysis. Of course you may need to find someone to do the number-crunching, but many researchers or students would jump at the chance to publish results from good data sets, and could at least provide some valuable initial advice.

Nest depression in barley, by Rosemary Setchfield

In barley crops, cereal stems are often broken around Corn Bunting nests, providing a useful cue.

THANKS

This research was part-funded through an AfBiE (Action for Birds in England) partnership with Natural England.

FIND OUT MORE

To read more about the project visit: **https://ww2.rspb.org.uk/community/ourwork/b/biodiversity/archive/2016/12/06/research-finds-simple-solution-to-save-our-corn-buntings.aspx**

Matt's RAS site, by Matt Prior

The farming community has also undertaken habitat improvements, including creation of 12 dewponds and the planting of many miles of hedgerows and a huge acreage of conservation cover crops.

Sowing seeds of a Tree Sparrow RAS

In 1999, as Conservation Officer for the Wiltshire Ornithological Society, Matt Prior set up the Wiltshire Tree Sparrow Recovery Project, with assistance from the RSPB. Since then, the project has grown to include over 1,100 nest boxes and 12 major feeding stations across an area of 700 km^2. As Matt explains, through years of partnership working, the farming community is now highly engaged with the project, providing seed and, in many cases, filling the feeders.

Well-stocked feeding stations are pivotal to both the species' recovery and the RAS project. Each consists of large hanging feeders, seed scattered under hedgerows and into conservation crops, or a mixture of all three, depending upon the situation. We ring at these winter feeding sites once or twice each year to minimise disturbance. The recoveries during these sessions tend to be of birds ringed as nestlings during the previous summer, either from the same site or from other sites up to 12 km away. The ringing data produced during these winter ringing sessions have helped us plan where to erect new nest boxes and establish more feeding stations to expand the project.

ESTABLISHING A RAS

Having undertaken a fair amount of ringing, we realised that we knew very little about the age structure or origins of the breeding population, which could provide more detailed information about how colonies are formed and sustained. This knowledge is important as Tree Sparrow colonies are known to suddenly disperse or implode; we ourselves have had a colony of 28 pairs vanish in one year. One of the key strengths of our recovery project is that it is undertaken at the landscape scale, and if one colony declines, another may be able to prosper. Our retraps have shown how diminishing colonies have been augmented by nestlings from our boxes that have dispersed from up to 32 km away.

The most obvious way to capture adult Tree Sparrows during the breeding season would be by lifting birds off the nest, and if this were possible, Tree Sparrows would be an ideal subject for a RAS project. Unfortunately, Tree Sparrows are prone to desertion if lifted off a nest with eggs; the desertion rate can be as high as 67% during early incubation (Kania 1992).

Interestingly, during the course of the nesting season I do sometimes touch adults accidentally, especially if they are nestled down in a deep nest; provided I withdraw my hand without picking the bird up, I have never experienced a desertion. The mantle of a Tree Sparrow gives it the perfect in-nest camouflage, and I think it is possible that if the adult is touched, but not handled, it thinks it has managed to hide successfully so it doesn't desert the nest.

REFERENCE

Kania, K. (1992) Safety of catching adult European birds at the nest. Ringers' opinions. *The Ring* **14**, 5–50.

The BTO was very keen for us to turn our project into a RAS, having established that the sensitivity of Tree Sparrow to handling occurred when the bird is in the nest, not near it. The RAS area was selected to be a 250-km^2 area of predominantly chalk arable farmland within which most of the inter-site movements take place, and the majority of the nest boxes are located.

CATCHING FREE-FLYING TREE SPARROWS

The most effective ringing sessions have been in mid April, catching birds at the two major feeding stations. By this time, most of the winter flocks have dispersed and fewer of the remaining individuals will move to other breeding sites, with the possible exception of birds that breed on top of the hills, which tend to arrive at their breeding sites later. First-brood laying dates vary by five weeks, with many of the earliest sites being about 150 m above sea level and the latest sites being up to 250 m above sea level.

The first site is a huge colony, the main wintering flock numbering 350–400 birds, with 36 pairs using nest boxes, a further 30 occupying natural sites and 35 more pairs breeding within 2.5 km. A hedgerow of about 150 m in length links the main breeding site with a maize silage clamp, the prime feeding area. We have sited two large feeders by a gap, halfway along the hedgerow, and simply put two 6-m nets across it; we then catch the birds as they swarm up and down this hedgerow. The average April catch here is 30 Tree Sparrows per session.

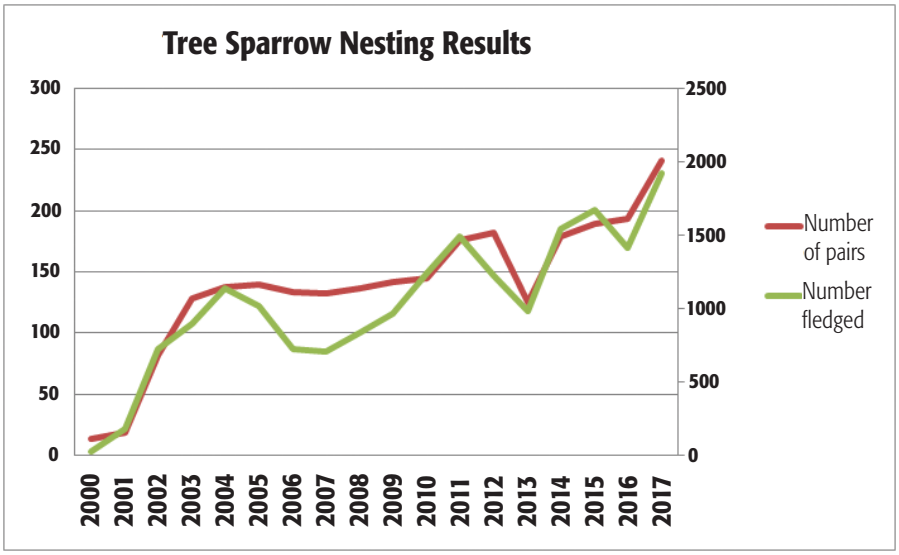
The second site supports about 300 Tree Sparrows throughout the winter and has a breeding colony of 15 pairs in nest boxes and 10 pairs in natural cavities around a barn, alongside a 1-km hedgerow. This hedgerow has 11 huge feeders situated along its length, provisioned by the farmer who grows his own millet for this purpose. The barn has a large bramble patch in which the Tree Sparrows roost at night and also rest in by day. They exit this roost and then sweep up and down the hedgerow visiting the feeders. We are very lucky that the farmer has allowed us to cut net rides across the hedgerow and the feeders have been sited very near to these. The average April catch at this site is 24 Tree Sparrows per session.

CATCHING AT THE NEST

We try to focus our breeding-site catching when birds are on their second broods, with a few sessions in the third-brood period. The standard approach in the midst of the breeding season is to get to the site at least two hours before dawn and, operating silently without any light, put nets up in front of the boxes, leaving 4–6 m between the box and the net so as to avoid any connection between being caught and the nest box. Some birds exit the boxes by flying

Nets set between a hedgerow and barn, by Matt Prior

PIT-tagged Tree Sparrow, by Matt Prior



sideways from the box, and birds tend to be quite consistent in the route they take. We notice this as we are going around checking the boxes for nest records and ringing, so for certain boxes we put the nets at different angles to intercept the flight lines. If the site has a feeder, we also put a net up by it, or across gaps in hedgerows that are foraging flight lines.

It is vital not to compromise the welfare of the nest box contents and so we plan the session for when the majority of the broods are older than four days; all birds are processed quickly and the nets in front of the feeders are taken down an hour after dawn, which then leaves the rest of the day for nest monitoring across the whole project. These targeted sessions catch, on average, eight adults a time, with a bonus of recapturing lots of juveniles. We have been surprised at how fast they disperse, with a movement of 2–3 km within three weeks of fledging not unusual. In 2017, 57 of the adults recorded by the RAS project were ringed in our nest boxes and so are of known age; of these, 79% were hatched in 2016, 17% in 2015 and 2% in both 2014 and 2013.

PIT TAGGING

Like all sparrows, Tree Sparrows are hard to catch and net sets have to be cunning to be successful, but they are even harder to catch for a second time. We were therefore keen to try a different, passive retrapping technique to compare longevities between methods.

For the past two years, we have fitted birds with PIT tags during winter sessions at one colony of 21 nest box pairs situated in a large rural garden. The landowner then moves two data recorders around the site, putting them onto boxes when the chicks are between four and seven days old.

In 2016, 11 tagged birds used the boxes and in 2017, 14 tagged birds used them, but no birds from the first year were still present the following year. We were expecting to find that some birds may use boxes in successive years so these initial results are quite surprising. PIT tagging is not without its pitfalls, however. We have lost data during downloads and it soon became apparent that not enough of the birds are tagged; the only solution is to put a lot more effort into catching birds prior to the breeding season.

In the early years of the project, our only aim was to conserve Tree Sparrows in our area. With the population ever increasing, we are now driven to understand their population dynamics better and to help others with their Tree Sparrow projects. We will therefore be spending many more hours trying to catch even more Tree Sparrows during the breeding season, using a few more-imaginative trapping techniques.

What RIN do for the other 363 days

I am writing this column a few days after my spring trip to Thetford for the BTO Board and Ringing Committee (RIN) meetings, and while Easter throws rain, snow and an easterly gale at the windows. The Chiffchaff and Sand Martin seen on the coast a few days ago will be having a pretty hard time, and there's no incentive to venture outside!

Peckham the Cuckoo fitted with a satellite tag, BTO

SMTP expertise spans the manufacture, attachment and use of special equipment, as well as avian veterinary experience and knowledge.

These trips and meetings always remind me just how much effort and commitment volunteers put into the BTO and its activities. The Board members contribute hugely to the overall direction of the BTO, and RIN members contribute far more than might be envisaged from a formal timetable of two committee meetings per year. Most members are on one or more of the formal or informal subgroups that we have (see page 24), which involves them in substantial work between meetings. The Ringing Standards Select Committee considers and approves new A-permit applications, and deals with any disciplinary matters that arise. Richard Broughton is part of the Editorial Team for *LifeCycle*, and helps to guide what is published here. Adrian Blackburn, our new elected member (see page 24), agreed at the spring meeting to help the Bird Observatories Council to adjudicate on awards for the Young Bird Observatory Volunteers programme.

The Manual group is advising on the update of the *Ringer's Manual* (which is currently being undertaken by Jacquie Clark and me), and has already provided new guidance on ringing heron and egret pulli. Without a doubt there will be more ringing developments which will require new support materials to be provided in the future, via the novel routes outlined in the paper presented at the latest RIN meeting, and the Manual group will act as a source of advice on these. The Training group considers the best ways we can develop ringing training, permits and standards, as we look for a new approach to these, and we had a good discussion on the standards required for a pullus endorsement at the RIN meeting.

Many more ringers provide us with ongoing help, advice and guidance. The Cannon Netting Technical Panel continues to review and advise on this specialist area, and the Special Methods Technical Panel (SMTP) adjudicates on permissions for the use of novel trapping methods and the use of new technologies in ringing, marking and tagging birds (see page 25). We welcomed Brian Cresswell, the new Panel chair, to the spring RIN meeting, when he outlined his thoughts on the future work of the Panel.

Linked to this, RIN members have been aware that whilst the SMTP considers applications to use special methods, it has not been simple enough for ringers considering using tags and other similar equipment to get advice on the best systems to use before they submit their applications. To address this matter, we have formed a Tag Attachment Group (TAG), led by Ewan Weston, whose aims are to collate, co-ordinate and provide information on the best practice of choosing and fitting tags to birds. Already, Ewan has provided some advice to two ringers, who contacted the group concerning projects on Little Terns and Bali Mynas, and the group aims to help any ringer find the best options for their projects. One early proposal is to hold a workshop that will focus on the best practice and techniques for attaching harness-mounted transmitters for passerines. They are currently looking into venues for this workshop, and hope that it will complement the raptor harness workshop which was held some years ago. They are also open to suggestions for other workshop or forum subjects.

If you have an interest in or questions about the work of any of these groups, do remember that you can email **rin@bto.org** and your email will be forwarded to the appropriate person; they are working hard to help you and feedback is always welcome.

Ian Bainbridge, on behalf of the Ringing Committee

INTRODUCING YOUR NEW RIN MEMBER

ADRIAN BLACKBURN

I was born and brought up on an isolated farm in east Lincolnshire and was interested in wildlife, in particular birds, from a very early age. Although I have no recollection of the event, my mother told me she found me inspecting a Woodpigeon's nest, about 15 feet up an apple tree, when I was three years old. The interest in birds was encouraged by my primary-school teacher and really took off when I started to visit Gibraltar Point at the age of 10. It was here that I first became involved with ringing; I started training there in November 1963 under the guidance of the warden Barrie Wilkinson. I also helped out on several ringing courses at the same venue run by Bob Spencer, Ken Williamson and Chris Mead.

In 1969 my career in teaching brought me to north Nottinghamshire where I still reside. After my initial experience of training I have always been keen to impart knowledge and train ringers to a high standard. Since 1984 I have organised or attended in excess of 50 ringing courses, mostly in north Nottinghamshire and at Spurn Point Bird Observatory, but also at several other venues around the UK. I have always held the view that ringing courses are beneficial to everybody in attendance, not just the course participants seeking training or advancement.

During the last 50 or so years, I have been involved in most types of ringing in the UK ranging from the usual mist netting to regular visits to Sule Skerry ringing seabirds, and monitoring of breeding owls and raptors in Nottinghamshire and Lincolnshire. I trained for a cannon-net endorsement in the mid-nineties and have been undertaking a long-term study of Wigeon in north Nottinghamshire ever since. I have also had considerable experience of ringing abroad, including visits to Portugal, Mallorca, Senegal, Gambia and Australia. In 2003 I was awarded the Bernard Tucker Medal for services to ornithological research.

I am still heavily involved with ringing and training, although my attendance at ringing courses is less frequent these days. I am looking forward to representing the views and concerns of ringers over the next four years whilst serving on the Ringing Committee, and I will endeavour to implement my election pledge to introduce greater transparency, openness and democracy.

Ringing Committee 2018

The Ringing Committee (RIN) supervises the operation and development of the Ringing Scheme and the Nest Record Scheme.

RIN meets twice a year, in March and September. The agenda, non-confidential papers and minutes for each meeting are available on the ringers-only pages of the website (**www.bto.org/ringing-committee**).

Members are happy to receive correspondence at any time throughout the year. Members' contact details are available on the ringers-only pages of the website. Members can also be contacted through the RIN email address: **rin@bto.org**

Members hold roles on specific Working Groups (WG) as follows:

Ian Bainbridge – Chair of RIN, Chair of Training WG, member of Manual WG
Jen Smart – Vice Chair of RIN, member of Tagging WG
Stu Bearhop
John Black – member of Manual WG
Adrian Blackburn – RIN rep with Young Bird Observatory Volunteers programme
Richard Broughton – member of Programme WG, member of *LifeCycle* Editorial Board
Tony Cross – member of Manual WG
Stephen Hunter
Ewan Weston – member of Tagging WG, member of Manual WG
Kate Clarke – C permit rep, member of Training WG
Ellen Marshall – T permit rep, member of Training WG

The Special Methods Technical Panel

BTO is recognised internationally for its high standards, and BTO ringers are justifiably proud of the skills and expertise that they develop, both in catching and handling birds and collecting robust biometrics and other data. Furthermore, we all care deeply about the birds that are temporarily in our care during ringing operations. We owe the same duty of care to birds to which we attach tags, not only during handling, but after they are released. We need to be confident that a tag and its attachment will not unduly affect a bird's movements, behaviour or survival.

To reduce the risk of harm to any bird, and to ensure that the same high standards for ringing and training are also applied to tagging, BTO controls the fitting of tags by way of an endorsement to a ringing permit. Legally, this enables ringers to undertake activities otherwise prohibited under the Wildlife and Countryside Act 1981 (as amended), a responsibility delegated to the BTO by the Country Agencies (Natural England, Natural Resources Wales, Scottish Natural Heritage and the Department of Agriculture, Environment and Rural Affairs, Northern Ireland).

The law on animal research also applies to some tagging operations. Compliance with the Animal (Scientific Procedures) Act 1986 (as amended) (ASPA) is regulated by the Animals in Science Regulation Unit (ASRU) of the Home Office. ASRU have delegated to the BTO the responsibility for issuing licences for tagging and sampling methods that fall short of the threshold for requiring an ASPA licence; those that cross the lower threshold are still issued by ASRU.

As tagging birds is a highly specialised activity, BTO has assembled a panel of (currently) six individuals with diverse expertise in bird-tagging technology, trapping and tagging methods, and veterinary science. The job of this panel is to assess applications from ringers to use so-called 'Special Methods'; hence the name 'Special Methods Technical Panel' (SMTP). SMTP mostly scrutinises applications to attach tags, but Special Methods also include unusual traps or trapping techniques and the taking of some biological samples.

The primary criteria used to assess applications are based on the safety of the proposed technique, the likelihood of the work providing useful results and the competence of the applicant. Where possible (i.e. if the tagged individuals are likely to be re-encountered in future) the panel will specify a requirement to monitor and compare tagged with untagged birds. Permission to continue using a Special Method must be renewed annually, and a detailed report on activities undertaken will be required each year before a renewal is granted.

BRIAN CRESSWELL, CHAIR OF THE SPECIAL METHODS TECHNICAL PANEL

There is a pleasing symmetry in the succession of the SMTP Chair from Rhys Green to me. Rhys first introduced me to radio-tagging when I worked for him 33 years ago. After finishing a biology degree it was my first 'relevant' job; researching Snipe and Black-tailed Godwits on the Somerset Levels and Cambridgeshire Fens. In 1985, Rhys recommended me for a job at Biotrack, a company making wildlife tracking equipment, where I've been ever since.

Back then, I was Biotrack's only employee. Now, 32 years and c. 200,000 tags later, we employ 35 people and have supplied tracking equipment for over 1,000 species in 130 countries. I started out building radio tags, but soon I was also answering letters (not even faxes in those days, let alone email!) from biologists wanting tracking equipment. Later I taught myself electronics and started designing new radio tags. Now, as Managing Director, I no longer do hands-on electronics design but am still closely involved in guiding tag development. Tracking technology has become extremely sophisticated in the past few years, with wildlife telemetry companies and university departments building myriad devices to monitor birds' movements and behaviour. These are exciting times in bird tracking.

I have always maintained an interest in field research, which is what I really wanted to do after graduating. My main interest is in Nightjars, which I've ringed and tracked with friends in Stour Ringing Group since joining in 1985. I have quite a lot of field experience too, having tagged 26 bird species (and a few mammals and fish) either through my own projects or helping others. My favourite projects were on Barn Owls and Bearded Tits in the UK, Red-billed Curassows in Brazil and American Woodcock in Louisiana.

I feel honoured to return to the SMTP as Chair, having been a member of the panel once before until 2015. It is not the easiest tightrope to walk, with the increasing urgency of conservation research, complex, rapidly changing technology and the necessity to protect individual birds and abide by animal-welfare legislation. Rhys will be a tough act to follow as Chair, but I'll do my best to stay on that tightrope.

European Hornet queen, by Richard Broughton

Although they look fearsome, the large and impressive European Hornet queens are usually quite docile when scouting for nest sites in early spring, when they may appear inside nest boxes. If left undisturbed they may build their paper nests suspended from the box roof.

What's in the box?

There are an estimated 4.7 million nest boxes in UK gardens (Davies et al. 2009), with many thousands more in parks, woods and nature reserves, representing a vast resource for wildlife and potential nest recorders. The majority of these will be small-holed boxes, aimed largely at tits, and usually made of wood or woodcrete. As Richard Broughton, an Ecologist at the Centre for Ecology and Hydrology explains, it is not just birds that make use of this fantastic resource.

TREE BUMBLEBEES
In an era of declining pollinators, the Tree Bumblebee, with its distinctive ginger thorax, black abdomen and white tail, is a phenomenal success story. Having expanded across mainland Europe, before arriving at Southampton in 2001, they have spread rapidly across England and Wales, reaching Scotland in 2013 and Ireland in 2014. They are still spreading and infilling, so records are important in mapping their expansion and abundance.

Monitoring of small nest boxes contributes around 17,000 nest records per year, which is about a third of the NRS total. Just under half of these annual nest box records are Blue Tit nests, and another third are Great Tits, with the remainder dominated by Tree Sparrows, Pied Flycatchers, House Sparrows, Common Redstarts, Coal Tits and Nuthatches, with a smattering of Marsh Tits, Wrens and Willow Tits.

As any nest recorder can testify, however, birds are not the only occupants of nest boxes. All manner of invertebrates and small mammals can be found, including parasites; some are competitors for the nest box, others just looking for temporary shelter. Although some of these potential inhabitants are undesirable from an avian point of view, many are fascinating in their own right and some are of great scientific and conservation interest.

Small mammals and many insect groups tend to be greatly under-recorded, and so nest recorders are in a position to contribute useful data to the relevant recording schemes. Such records can have real scientific value, helping to map the expanding ranges of species responding to climate change, or to fill in gaps for species where the current range is poorly known.

BUMBLEBEES

Bumblebees are increasingly common in nest boxes meant for birds, and in early spring one may lift the lid of a box to find a large queen bumblebee resting inside. These early bees are often Buff-tailed Bumblebees (*Bombus terrestris*), an abundant and widespread species that is expanding northwards into the Scottish Highlands. Queens emerge from February to search for nest sites in old vole or mouse nests, but will also investigate nest boxes and rest inside on cool days. When disturbed they'll buzz as a warning and perhaps fly off clumsily.

The most frequent 'nest box bee' is a relative newcomer, however: the Tree Bumblebee (*Bombus hypnorum*). This is a species of woodland, parks and leafy gardens, which habitually nests in tree cavities (as the name suggests).

Tree Bumblebees have a particular liking for nest boxes and are direct competitors with nesting birds; one with a sting in the tail! In my Cambridgeshire nest box studies, Tree Bumblebees were able to displace Blue

Tits from active nests and take over the box (Broughton et al. 2015). Queens emerge to search for suitable nest cavities just when tits are building or laying, and a tit nest in a dry nest box is just what she's looking for. The queen will burrow into the nest and buzz aggressively to force the birds to abandon. She will then churn up the material into a dome, burying any bird eggs, and bring in pollen to form into a lump inside on which to lay her own eggs and start a colony.

A nest recorder gently touching the nest material to feel for cold eggs on a routine check may then hear the queen's aggressive buzzing from within, which is usually sufficient warning to back off. Tree Bumblebees are very defensive, and once the colony is established the workers will guard the nest box entrance, being likely to sting if they are disturbed and may even chase you away for some distance. It is therefore always advisable to check suspect boxes from a distance and look for bees around the entrance, especially if a queen was heard buzzing on an earlier visit. Other bumblebee species may also take over bird nests in a similar way, and all are worth recording as this mostly seems to occur in nest boxes, being very rare in natural cavities.

Tree Bumblebee *Bombus hypnorum* male, by Nadine Mitschunas

The Tree Bumblebee is an increasingly common occupant of nest boxes, where it can take over the nests of tits and other passerines to start its own colony.

OTHER INSECTS

Other feisty insects likely to occur in nest boxes are various wasps, the most impressive being the European Hornet (*Vespa crabro*). Hornets are also expanding their range from central and southern England and records are valuable from all areas. Hornet queens will investigate nest boxes and may begin a colony by building a paper nest suspended from the roof, possibly evicting any resident birds. Hornets are not abundant and their conservation status is unclear, so nest boxes can be useful sources of local breeding records. Although generally docile, Hornets may attack if the nest is disturbed. The stings are very painful, and if a box is opened by mistake the best option is to run!

Another wasp to be found in nest boxes is the small Saxon Wasp (*Dolichovespula saxonica*), which colonised Britain in 1987 and has since become locally common, but is still expanding its range. This species seems to like nest boxes too, but in the Cambridgeshire study they only built their paper nests in boxes that remained unoccupied by birds (Broughton et al. 2015). Saxon Wasps are quite common in nest boxes on the Continent, and with climate change and range expansion they can be expected to occur more often in British nest box studies.

Nest recorders can help map the spread of Saxon Wasps through Britain, and possibly into Ireland, although separation from other small wasps can be tricky. Tree Wasps (*D. sylvestris*) and Median Wasps (*D. media*) can also occur in boxes, as can Common Wasps (*Vespula vulgaris*), and taking photos or specimens for checking by experts is recommended. By autumn a wasp colony will have died off and there are often dead specimens under the disintegrating nest within the box.

SMALL MAMMALS

Several small mammals will habitually use nest boxes, particularly Wood Mice. Like bumblebees, Wood Mice will reorganise the nest material into a ball, often bringing in other material such as leaves. Female Wood Mice will sleep communally in nest boxes, and four or five may jump out if disturbed, but single females may also breed inside during spring or summer.

Wood Mice are quite arboreal, and can be found in nest boxes several metres above the ground in woodland and farmland hedgerows. Overwintering Wood Mice may

REFERENCES

Broughton, R.K. et al. (2015) Nest-site competition between bumblebees (Bombidae), social wasps (Vespidae) and cavity-nesting birds in Britain and the Western Palearctic. *Bird Study* **62**, 427–437.

Davies, Z.G. et al. (2009) A national scale inventory of resource provision for biodiversity within domestic gardens. *Biological Conservation* **142**, 761–771.

Hebda, G. et al. (2017) Decomposition of nest material in tree holes and nest-boxes occupied by European Starlings *Sturnus vulgaris*: an experimental study. *Acta Ornithologica* **52**, 119–125.

Maziarz, M. et al. (2017) Microclimate in tree cavities and nest-boxes: Implications for hole-nesting birds. *Forest Ecology and Management* **389**, 306–313.

Brown Long-eared Bat, by Richard Broughton

A Brown Long-eared Bat roosting in a nest box, with the long outer lobes of its ears tucked under the wings.

fill nest boxes with seeds or acorns as food larders; as many mice don't survive to return to their stash, these need to be removed before spring if birds are preferred. In Cambridgeshire woods, up to a quarter of nest boxes checked in March had hosted overwintering Wood Mice, with evidence of nests or food stores.

Another fantastic mammal that seems to like nest boxes is the Pygmy Shrew, which is often found in boxes fixed at 1–2 m above the ground, intended for Marsh Tits in my study woods. Pygmy Shrews also reshape tit nest material into a ball, but can be distinguished from Wood Mouse activity by the presence of a characteristic latrine of black droppings in one corner of the box. Gently probing the nest often reveals the occupant. Records of species such as Pygmy Shrew, Yellow-necked Mouse, Hazel Dormouse and Edible Dormouse are particularly valuable to recording schemes, and the widespread Common Shrew and Bank Vole may also occur.

BATS

Bats may sometimes be found roosting in nest boxes, and their special protection requires that they remain undisturbed. Brown Long-eared Bats seem partial to Schwegler nest boxes, roosting at the apex of the roof, but other species are also potential inhabitants. Contacting the local bat group is advised for help with identification and recording.

FLEAS

Finally, it's worth mentioning a genuine problem species associated with nest boxes: the Hen Flea (*Ceratophyllus gallinae*). Many nest recorders will be familiar with seeing a horde of fleas surrounding a nest box entrance, waiting to jump onto anything warm-blooded, be it avian or human. Such infestations are virtually unknown in natural tree cavities, and reflect the distinctive microhabitat created by nest boxes.

Compared to tree cavities used by small birds, which are typically found in living trees, nest boxes have thinner walls and so offer less insulation, but also a much drier microclimate (Maziarz et al. 2017). This is important, as the humidity in natural cavities allows nest material to effectively 'compost' over the winter, making tree cavities almost self-cleaning and ready for birds to use again the following spring.

Nest material decomposes at a much slower rate in nest boxes, and the microclimate can be so dry that old nests can 'mummify'. A study of Starling nests found that 98% of plant material in nest boxes remained intact over winter, compared to only 25% in tree cavities (Hebda et al. 2017). This old material in nest boxes provides habitat for overwintering fleas which then infest broods in the following year, at levels way beyond that seen in tree cavities.

CLEANING NEST BOXES

Cleaning out old nest material soon after fledging reduces the flea problem, but also removes habitat for overwintering mammals and other invertebrates. As a compromise, I clean out boxes when the fleas are largely dormant in the old nest, giving other species a chance to have overwintered. And if I find a bumblebee, Hornet or small mammal inside then I leave them in peace and make a note of it to submit a record.

Where to submit records of other species found in nest boxes

Hornets, wasps and bumblebees: www.bwars.com is an excellent resource for identification and submitting records.
Small mammals: www.alerc.org.uk is the network of local Environmental Records Centres
Bats: All bats are specially protected and should not be disturbed when roosting. Advice and contact with local bat groups is available from the Bat Conservation Trust at **www.bats.org.uk**
www.brc.ac.uk/irecord is an app and website for submitting and sharing records of any species to be checked by experts and collated into the appropriate national recording system.
www.ispotnature.org is a friendly online community where you can ask for help with identification from photos.

A better understanding of risk

Any effect of capturing wild birds on their individual welfare, or that of their wider populations, is an important ethical consideration. It also has significant implications for the integrity of the data collected, as biases may be introduced if capture and handling bring about changes in behaviour or survival. Ultimately, the benefit of the information accrued when capturing wild animals for study needs to outweigh the potential risk to individuals that are caught. New BTO research, just published, aims to quantify these risks and help us to reduce them.

Siskin in a mist net, by Lee Barber

The study aimed to identify how to make ringing birds as safe as possible.

Wild birds have been marked with metal rings as part of scientific studies throughout the world for over a century. The data generated by these studies have provided much-needed information on movements, demographic processes and individual life histories, as well as helping to guide conservation actions. Understanding the welfare implications of such studies is an important part of determining the balance between the knowledge gained from such studies and the potential risk to the individuals that are caught.

The potential effects of fitting rings and electronic devices to birds have been investigated through a series of reviews and studies. The direct effects of the capture methods themselves, though, have received less attention, with few published studies quantifying the risks. A new study addresses this gap by examining 1.5 million recapture records of 166 passerine species, caught using mist-nets operating under the British and Irish Ringing Scheme. Mist-netting is considered to be safe and effective when carried out by experienced, trained individuals, following published guidelines. The training process is both structured and intensive, with volunteers individually mentored and then formally appraised before they are able to operate unaccompanied, a process that typically takes several years and involves handling a significant number of birds.

Despite this, there are occasional incidents of capture-related mortality or injury. Defining any threshold of 'acceptable' mortality in the context of research into wild bird populations is a difficult and sensitive issue, but it is important that we understand the level of risk, and its implications for welfare and data quality.

The study quantified the reported mortality rate among common passerines recaptured using mist-nets, from data submitted to the BTO. Factors which may influence the likelihood of mortality were also investigated, facilitating production of improved guidance for those operating mist-nets to capture wild birds. Overall mortality rates were low – the average was 0.11% – with most fatalities reported to have occurred before individuals had been extracted from the nets, and some may have occurred for reasons unconnected with ringing, e.g. the individual was already in poor condition. Juvenile birds appeared to be at greater risk than adults, and the incidence of predation – the single largest identified cause of mortality, accounting for over 70% of deaths – was seasonal, with risk increasing during the winter. Mortality rates, although very low, varied between species; the apparent risk was greatest for Bullfinch and Chiffchaff. A similar study in North America reported a slightly higher estimate (0.23%) than that found here. Whilst it is important to understand and to minimise the scale of any effects on capture-related mortality or injury, it is unlikely that a zero mortality rate will ever be possible when trapping and handling wild animals for scientific purposes.

The study also makes a number of recommendations; some of these will help to refine our guidelines for those trapping and handling wild birds, while others suggest additional opportunities to secure information that could be used to better understand risk factors and associated mortality.

REFERENCE

Clewley, G.D. et al. (2018) Estimating mortality rates among passerines caught for ringing with mist-nets using data from previously ringed birds. *Ecology & Evolution* doi:10.1002/ece3.4032

The 'Refine Location' tool allows you to map precise nest locations within an existing 'General Site', either by specifying a point on a map or a 10-figure grid reference.

DemOnic nesting

There is no doubt that IPMR played a pivotal role in setting the Nest Record Scheme back on track but, as Mark Cubitt would acknowledge, basing the NRS functionality on the ringing system necessitated some compromise. DemOn gave us the opportunity to tackle some of the issues that arose from this; Dave Leech reports on how we've taken it.

Many of the new recruits to the demographic schemes must wonder if there was ever a time when DemOn wasn't being built. It has been an epic journey and it is by no means over yet, but with a quarter of a million ringing encounters input into the system so far exceeding the volume of submissions now received via IPMR over the same period, the ringing side of the functionality is becoming well-established. Development of the nest recording element started much later in the process and December 2017 was the first sight that many of you had of it, but there have already been over 8,000 records entered and the feedback received thus far has been invaluable, so thanks to the 300 nest recorders who have taken the plunge so far.

BRINGING IT ALL TOGETHER

As I've written many times over the years, the NRS and the Ringing Scheme are really two halves of the same whole, providing complementary information on the degree to which changes in breeding success and survival influence the changes in populations sizes monitored by census surveys such as the BTO/JNCC/RSPB Breeding Bird Survey. Over the last decade we've been trying to reflect this by increasingly integrating the two schemes; IPMR represented a big step forward in this respect and DemOn takes us still further. As in IPMR, adult and pullus ringing data can be entered through the NRS side of DemOn but this process now works both ways, with nestling encounter records entered through the ringing side of the system automatically generating a single-visit nest record to which subsequent visits can be added via the NRS functionality. As any ringer has the potential to create a nest record in this way, anyone registering for their T permit will now automatically be registered as a nest recorder.

ACCOMMODATING NOMADIC NESTERS

One of the things IPMR did very well was enable details of regular breeding sites, be they artificial boxes and platforms or natural ledges and crevices, to be specified in advance. This not only saved time by allowing details to be defaulted when the site was selected, but also ensured that locations were consistently identified when re-used in subsequent years. While this was very helpful for predictable species, it was less suited to open nesters such as, to pick a species at random, Reed Warblers, where the nest would not occur in exactly the same place two years running. The default habitat values relating to the IPMR 'Place' from which the record originated would still be relevant, but the grid reference would need to be edited every time to provide a precise spatial reference.

One of the core concepts of DemOn is the ability to create very precise locations while you are actually inputting the nest record, rather than having to set them up in advance. This can be achieved in two ways:

- The 'Add New Location' button allows a nest site at a new location to be specified, either by typing in a grid reference (up to 10 figures, equivalent to the nearest metre, so a big advance in accuracy relative

to the IPMR 6-figure maximum) or clicking on a map.

- The 'Refine' button allows a more accurate location to be specified within a pre-existing 'General site' (equivalent to over-writing the 4-figure grid reference corresponding to the selected 'Place' in an IPMR nest record with a 6-figure grid reference, only again to greater accuracy).

For my Reed Warbler nests, I use the latter option, so my 'General Site' at Cranwich acts as an umbrella for hundreds of point locations that relate to individual nests, each with its own 10-figure grid reference derived in the field using a GPS. Obviously, I don't want to see all these in a drop-down menu of locations that DemOn presents me with in future, as the list would be endless and I'm very unlikely to ever record another nest in exactly the same location. For this reason, new or refined locations are not 'remembered' by the system (i.e. not presented to you as an option in future) unless you specifically ask them to be by checking a 'Remember Location' box when you create them.

Note that all of this functionality is potentially relevant to ringing activities too, as any RAS participants who target birds at their nests, and therefore move nets between a large numbers of different locations within and between seasons, will testify. Again, it is possible to associate captures with very specific locations without clogging up your drop-down lists of sites using the 'New' and 'Refine' options as above.

NESTING CSI

While there would clearly be no point in monitoring nests if they all succeeded, there's no denying that failures, especially late in the nesting cycle, can cause the blood to boil, driving even the most independent scientific minds to pointlessly curse corvids, mustelids, rain or gales. One thing that always frustrated me, however, was the lack of capacity to record the evidence allowing you to pin the blame on the appropriate culprit. I need worry no more; by clicking on the relevant failure code in DemOn, you can unlock additional fields that allow you to record more information about the putative cause of death or disappearance and the evidence that led you to that conclusion.

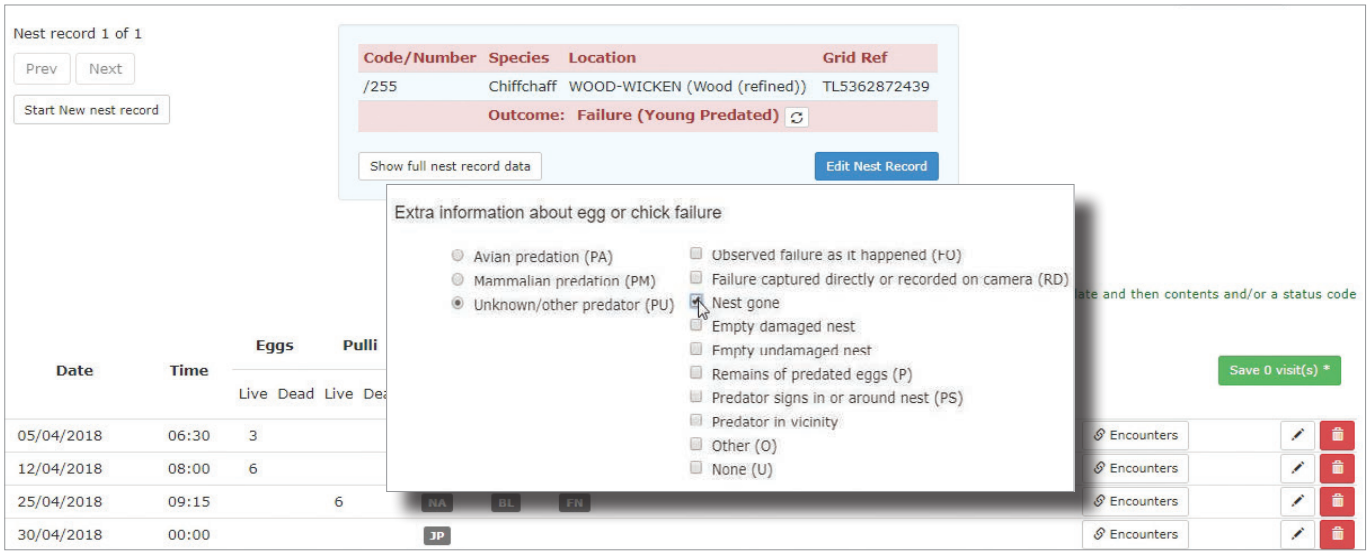
Thankfully, many nests do survive and a different suite of fields can be unlocked by clicking on the relevant success codes. Many volunteers have asked for the ability to record the number of individuals fledged and that is now possible, again alongside fields allowing you to record the evidence supporting your estimate. Note that this is not a variable that BTO will incorporate in our annual estimates, as different recorders may use it in different ways, but we hope it will be useful for your own summaries and analyses. Another handy new feature is the ability to record the precise location of fledglings sighted away from the nest.

WORK IN PROGRESS

So that's the good news; those of you who frequent the DemOn User Support Community page on Facebook will doubtless be aware that there is still work to be done, with the linking between nest records and pulli ringed on someone else's rings causing particular issues. We appreciate these bugs are annoying, and we're working on them as fast as resources allow but, as someone who has now entered 400 nest records with pullus encounters into the system, I can assure you that DemOn is already a viable alternative to IPMR for ringers and nest recorders alike.

FUNDING

DemOn development is only possible thanks to funding from JNCC, SNH, BTO, the Garfield Weston Foundation and volunteer contributions.



New functionality allows you to record additional detail about the causes of nest failure by clicking on the failure code.

Male House Sparrow with nesting material, by Denise Wawman

House Sparrows can't resist feathers from Silkie chickens and will collect them at any time of year, especially in cold weather, when they have young chicks and use them like a duvet.

Are terraces a House Sparrow des res?

This question crops up frequently in the NRS Forum in various forms, and is one which Denise Wawman has spent the last 12 years trying to answer. In this article, she discusses the nest box preferences of the House Sparrows in her garden on the West Somerset edge of Exmoor, where she rings 100–200 individuals a year for her RAS, now in its eleventh season.

In my garden, House Sparrows have a clear preference for a south-facing site and most of them nest under the eaves. The most-favoured nest style is a messy pile of grass, with a partial dome, on the shelf which forms the top of an artificial House Martin nest box. These are impossible to monitor safely as they are situated close together, with adjacent nests at very different stages. House Sparrow pulli are liable to explode and it can be difficult to keep control of chicks in what is essentially an open nest, so I was very keen to encourage them to move to more accessible housing.

NEST BOX DESIGN

My campaign to find the ideal House Sparrow nest box began with a mixture of standard 32-mm-hole boxes, a couple of commercially produced terraces and a Swift box, positioned on the walls of the house about 3 m above the ground. I had also erected some 32-mm-hole boxes, located at about 1.5–2 m high on the workshop and garden fences.

Over the years, the terraces attracted the odd pair of Blue Tits, which seemed to get confused and start nesting in all of the compartments, on one occasion laying eggs in two of them simultaneously. House Sparrows raised a single brood in one of terraces in 2007, a brood in either end of the west-facing terrace in 2016 and occasionally put a few bits of nest material inside before moving elsewhere. There was more success with the standard boxes, all on the less-favoured northern aspect of the house, with seven broods raised. The Swift box and the boxes in the garden were never used.

OUT WITH THE OLD

In late 2016, I decided on a complete change of plan, partly triggered by difficulty in finding anyone to foot a ladder on the few days when pulli needed ringing. All the boxes on the house were re-sited just under opening windows so that they could be reached safely, without having to lean out too far or use a ladder; this raised the height of most to about 4 m. The standard boxes were arranged in pairs.

I also modified both terraces while repairing them when they started to come apart at the joints. I blocked up the front hole, leaving just the two side entrances,

BOX LOCATION

If you are a light sleeper, or don't need a regular 4:30 am wake-up call, it might be best to avoid putting boxes under your bedroom window; amorous House Sparrows are rather loud!

and removed the two existing dividers in the box, replacing them with a single central divider. The boxes had always seemed too small for House Sparrows anyway. In some boxes I also placed a block of wood inside the box, a few inches from the hole to create an entrance tunnel; more like the entrance to holes in brickwork where they often nest.

In 2017, despite 2016 having been a very poor breeding season, both terraces had nests! The one under my bedroom window had a pair that made nests in both compartments and fledged three broods from the south-facing part. The other contained a pair that partially built a nest in both sides before laying in the south-facing box. Unfortunately, this pair lost their chicks during a weekend of torrential rain and abandoned the site. There was also a late brood in one of the standard boxes on the north of the house. Checking the boxes and ringing the pulli was really easy.

LOOKING FORWARD

This year, I plan to take advantage of needing to replace both terraces and having a south-facing window with no boxes under it to test various other styles of 32-mm-hole boxes with various entrance corridors. I will probably stick to single boxes because there is no risk of having two broods at different stages.

On the basis of what I have learnt so far I would advise against standard commercial terraces. Instead, I would recommend siting boxes on a south-facing wall, 4–5 m above the ground, and under windows for ease of access for monitoring.

Modified terrace with nests, by Denise Wawman

Modified terrace, showing the block of wood just beyond the entrance hole.

NRS participants who monitored 100 or more active nesting attempts in 2017

Linnet nest, by Mike Toms

Catrina Young 887; East Kent Wildlife Group 838; Merseyside Ringing Group 822; Arden Ringing Group 739; Noel & Julie Fenwick 706; Tom Dewdney 629; West Wiltshire Ringing Group 586; Bowden, Ball & Sheppard 551; South Devon Nesting Crew 544; Thetford Forest Ringing Group 527; Paul Roughley 537; East Dales Ringing Group 516; Sorby Breck Ringing Group 513; Rye Meads Ringing Group 466; Birklands Ringing Group 439; Jonathan Lingard 438; Louch & Thompson 435; South Manchester Ringing Group 416; Kevin Briggs 416; John Bell 412; Stephen Carter 381; Henry Cook 368; Fledgemore Nest Recording Group 365; Shropshire Ringing Group 356; Nicholas Watts 345; John Hyde 332; David Warden 321; Gwent Wildlife Trust 315; Peter Roe 309; Jonathan Groom 307; Neil Lawton 301; John Lloyd 288; Colin Gibson 284; Geoff Myers 266; David Oliver 266; Ronald Turkington 254; Nigel Lewis 254; Nagshead RSPB Reserve 251; Dave Coker 250; Lancaster & District Birdwatching Society 250; Newbury Ringing Group 248; Mervyn Greening 235; Simon Taylor 231; Frank Mawby 231; Stanford Ringing Group 230; Northumbria Ringing Group 230; Batty & Bateman 228; North West Norfolk Ringing Group 224; John Lawton Roberts 221; Simon Cox 221; Huddleston & Jackson Ringing Partnership 219; Chew Valley Ringing Station 219; Bristol Naturalists' Society 209; Manx Ringing Group 199; Mid Lincolnshire Ringing Group 195; Bob & Rob Swann 195; Kevin Sayer 194; Ted Cowley 193; RSPB Geltsdale nature reserve 193; West Cornwall Ringing Group 188; Andy Leach 186; Denise Wawman 186; Bill Haines 185; Geoff Pearce 184; Peter Rose 184; Hugh Insley 182; Derek Spooner 179; South Nottinghamshire Ringing Group 178; Paul Fenwick 176; North Wiltshire Ringing Group 175; Barry Caudwell 172; Keates & Preston 169; Leigh & Tony Kelly 168; Allan Hale 165; Pitsford Reservoir 164; Short, Williams & Thomas 163; Allan Dawes 162; Jack Daw 159; Jim Hodson & M Hodson 158; Waveney Ringing Group 157; Berkshire Downs Ringing Group 157; Suffolk Community Barn Owl Project 156; Peter Johnson 151; Robin Husbands 151; Simon Dudhill 150; Swaledale Ringing Group 148; Ray Gribble 143; Rockingham Forest Ringing Group 143; Mike Russell 140; Paul Slater 138; Wicken Fen Group 138; Hubble & Tracey 137; Isle of Wight Ringing Group 136; Martin Hughes 135; Dave Hazard 135; Jerry Lewis 133; Garry Barker 132; Doug Simpson 132; Jan Pritchard 130; Tony Davis 128; Nunnery Ringing Group 126; Christine Flint 125; John Griffin 122; Anne Goodall 122; Daniel Eva 120; Bucks Owl & Raptor Group 120; Jim Rushforth 120; Lyndon & Norma Jeffery 119; George Candelin 119; Gary Pitt 118; Stephen Hewitt 117; Jeremy Gates 117; Steph Tyler & Felicity Burge 116; Alexander Craig 115; Calf of Man Bird Observatory 115; Keith Seaton 114; Southern England Kite Group 112; Cwm Clydach RSPB Reserve 111; Dartford Ringing Group 111; Coquet Island RSPB Reserve 111; Iain Inglis 108; John Roberts 108; Treswell Wood IPM Group 107; Spurn Bird Observatory 106; North Norfolk Ringing Group 106; Chris du Feu 105; West Midland Bird Club Boddenham 105; Carstramon Wood 103; Garth Lowe 103; Richard Winship 102; Moor Piece Nature Reserve Nestbox Scheme 102; Nidderdale Birdwatchers 100.

‘Aberrant’ moult: emerging trend?

Last spring’s *LifeCycle* (Issue 5) included a photo of a Greenfinch that had moulted primary feathers during its post-juvenile moult. As Stephen Menzie explains, such a bird raises a number of questions: does this arise via a developmental accident or is there purpose in moulting this way? And if the latter, in future will we see a population-level shift towards a more extensive moult which may affect the criteria we routinely use to age that species?

Occasionally, we catch birds that really don’t fit the expected pattern of post-juvenile moult (PJM) for the species in question – and by moult, I’m talking about the purposeful symmetrical replacement of feathers, not an individual that has lost a handful of secondaries to a bramble bush. Some really do seem like aberrant one-offs: a Blue Tit that has moulted primary coverts; a Whinchat that has moulted primaries and secondaries but not tail or tertials; a Tree Pipit that has moulted the eighth greater coverts on both wings but had left all median coverts and a few lesser coverts unmoulted. These are just a few examples that spring to mind from my personal experience.

Other unusual moults appear to be simply the extremes of a ‘normal’ post-juvenile strategy – Blackbirds that have moulted tertials and the inner secondary; Goldcrests that have moulted the central tail feathers; and, although it might not seem obvious at first glance, Greenfinches that have moulted their central primaries.

GREENFINCHES

PJM in Greenfinches is hugely variable, from birds that moult nothing more on the wing than the lesser and a few median coverts all the way through to birds that have moulted six or seven primaries, two or three primary coverts, and inner and outer secondaries (see photos below). Primaries are moulted from P5 or P6 and radiate outwards in both directions; for example, moult might progress as follows: P5, P4 & P6, P3 & P7, P2 & P8, P1 & P9. The primary coverts are not moulted with the corresponding primaries, though – indeed, I have never seen a Greenfinch with fewer than four moulted primaries that has replaced any primary coverts. Instead, once the bird’s primary moult has reached a certain point it then starts moulting its primary coverts in a similar radiating pattern to the primaries. There is still a lot to learn about this type of eccentric moult; Kiat & Izhaki (2017) found, for example, that unmoulted primary coverts corresponded with a rapid primary moult.

REFERENCE

Kiat, Y. & Izhaki, I. (2017) *Journal of Avian Biology* **48**, 380–386.

Photos by Stephen Menzie

Extremes of Greenfinch moult. The left-hand bird has undergone a very restricted moult. No greater coverts are moulted, and three old median coverts have been retained during the PJM (October, Sweden). In contrast, the right-hand bird has moulted all median coverts, greater coverts, tertials, P3–9, S1 & S3–6 and PC4–6 (October, Cheshire).

Photo by Stephen Menzie

This Reed Bunting had symmetrically moulted P6–8 and S6 (September, Sweden).

Just how extensive can this moult get? Well, that is a slightly theoretical question, as an unringed first-year bird that has replaced all primaries might well be overlooked and recorded as an adult. Ringing nestlings and catching juveniles immediately post-fledging could play an important role in assessing this by providing known-age retraps. The available data suggest that the majority of juvenile Greenfinches that undergo PJM moult only a few primaries, therefore it is probably unlikely that young Greenfinches undergoing a complete PJM are being missed. If you do catch a bird that you're not sure about, the inner and outer primary coverts and the central secondaries will be the most commonly retained feathers or the last to be moulted.

OTHER SPECIES

Eccentric moult isn't limited to Greenfinches. Ringers in Britain & Ireland are just as likely to come across Goldfinches that have replaced flight feathers during PJM. Crossbills, too, regularly have a more extensive PJM (complicated further by their unhelpful habit of suspending it during irruptions) and Siskins can also moult primaries during their PJM, although seemingly much less frequently. Away from finches, Reed Bunting occasionally shows eccentrically moulted primaries and I've encountered singletons of Blackbird, Blue Tit and Dunnock that appear to have moulted a central primary or two as part of their PJM.

It is unclear if extensive PJMs in some species will become a more widespread strategy in the future. The number of extensively moulting individuals seems to be increasing, but is this a genuine trend or are we just getting better at noticing and recording the moult? Climate change may well be playing a part, either indirectly with temperature acting as a cue or directly by influencing resource availability; it is notable that PJM within a species is generally more extensive in warmer climes, e.g. in Iberia, where presence of moulted primaries in the above-mentioned species is often the norm. Only time – and continued observation of moult – will tell.

Photo by Stephen Menzie

This Blue Tit had symmetrically moulted all secondaries, P1–8, and the inner primary coverts. Unexpectedly, for a bird with such extensive moult, only the central tail feathers had been moulted. This is one of only two individuals detected with any primary coverts moulted, out of a sample of c.18,000 birds – the other individual had symmetrically moulted five primary coverts but no primaries or secondaries. Both are undoubtedly aberrant individuals showing unexpected moult patterns.

Fenékpuszt CES site at Lake Balaton, Hungary, by Katalin Odett Lukács

Ringers operate CES across Europe. This one, on the shores of Lake Balaton, Hungary, catches good numbers of Bearded Tits and Tree Sparrows.

CES Ringing – the European way

When you are noting down the details of the first retrapped Blue Tit of your CES session at 5 am, you are probably thinking more about a nice cup of coffee than global patterns of environmental change. As Rob Robinson explains, however, each capture of a bird on your CES site is now contributing to a growing Europe-wide database that will help us address some of these pressing conservation issues.

The idea behind CES is a simple one. By catching birds one can get some idea of their abundance; in years when birds are commoner they will be caught in greater numbers. However, just going out and catching some birds doesn't help all that much since we don't catch every bird, so we don't know how our catch relates to what is actually present; and, of course, the more effort we put in, the more birds we catch. At least most of the time! So some ringers came up with the idea of trying to make their effort more comparable and repeatable resulting in a Constant Effort Scheme, initially led by Mike Boddy. By making the same amount of effort, changes in catches between years should tell us what numbers are doing; are they going up or down?

TIMING IS EVERYTHING

But when to catch? In the summer, birds breed at different times, so young Long-tailed Tits can be caught in early May, but young Bullfinches rarely before July, and, for most species the number of breeding adults caught is highest at the start of the breeding season. In the winter, things are more complicated still as birds move around to find food, or to avoid cold weather. In an attempt to balance these differences CES aims for one catch once every 10 days or so through the breeding season. By formalising this schedule, we don't, for example, catch more young birds in one year because we made more visits later in the season, or more adults, if we made more early visits.

EUROPEAN ENTRY

Sites were first operated in Britain using 'constant effort' in the late 1970s, but a few years trialling different set-ups and ideas meant the programme was not formally adopted until 1986 (though enough sites were able to provide data to enable trends to be calculated back to 1983). Like most other simple ideas, it was quick to catch on. Finland (1987) and France (1989) were among the first to pick up the challenge, and now there are 18 schemes operating across Europe, from Portugal to Hungary; Croatia and Switzerland are among the most recent countries to join in.

In fairness, we need to note that, like many good ideas, that of standardising capture effort was not exactly new. In

HABITATS

Across Europe, CE sites are mostly operated in similar habitats to Britain & Ireland, with about a third of sites broadly being characterised as 'wet scrub' and another quarter 'reedbed'. In Britain, we have more sites in dry/thorn scrub than other countries, whereas other CE schemes also operate a small number of sites in farmland and garden habitats.

central Europe, three sites (Mettnau in southern Germany, Reit in the north and Illmitz in Austria) started a co-operation in 1972 with the same effort expended at each of the three sites – and what effort! They used 52 nets (albeit each one was only seven metres long) in eight habitats daily through the autumn migration period (July to October). This network was one of the first to pick up on declines of long-distance migrant birds, although because birds were coming from a broad swathe of central Europe and beyond, it was hard to pinpoint where the issues causing the fall in numbers might have arisen.

CES PROTOCOL

Most current schemes follow a similar protocol to the British & Irish scheme in dividing the breeding season up into, approximately, 10-day periods, with one catch taken per period. The length of time schemes operate through the season does vary, though. In southern Europe, longer periods of migration mean, typically, only nine visits are possible to avoid skewing the results by catching lots of birds that are just passing through. In Sweden and Finland, the season also starts a bit later, but mostly because northern sites may still be under several feet of snow in May!

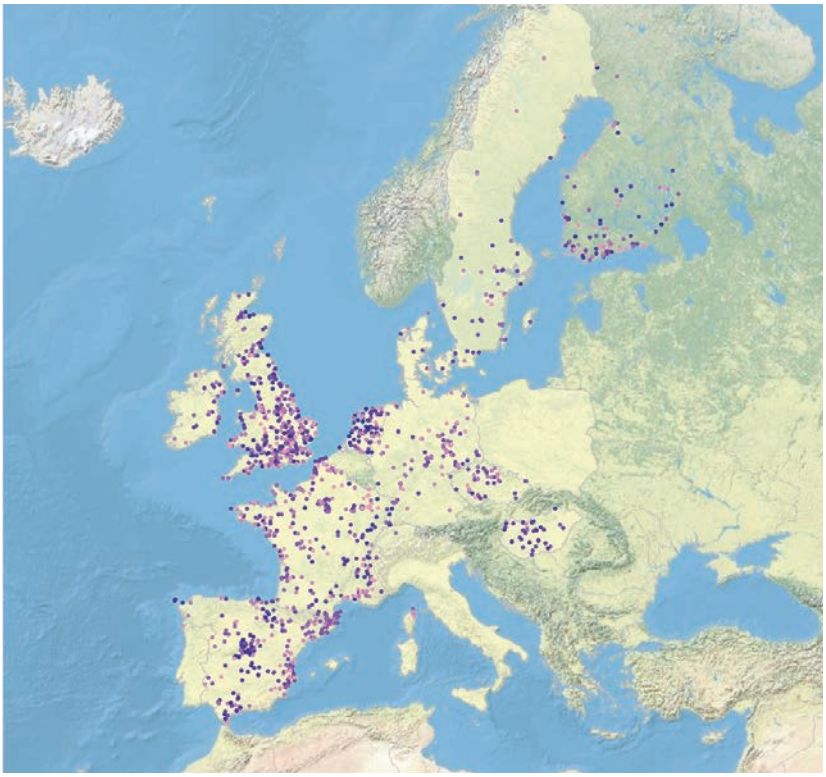
The five species most commonly caught across Europe will be very familiar to British ringers: Reed Warbler, Blackcap, Willow Warbler, Blue Tit and Great Tit. Reed Warbler tops the list in nearly all countries (though in Britain & Ireland it comes second) with the notable exception of Finland, where it has a restricted range.

RESULTS

Of course, CE sites tell us not just about the number of adult and juvenile birds that might be present on a site, but also something about how good a breeding season each species may have had. The fact that we recapture individuals also gives us information on survival. This is valuable because then we start to understand some of the processes that drive population change (is it number of young fledging, or the propensity for birds to die that causes overall numbers to increase or decrease?). So far, data from CE sites have been used primarily to look at how birds might respond to changing climates.

The comparison provided by northern and southern sites can help us understand how northern populations may cope with future changes. Analyses so far suggest that individuals are well adapted to the conditions currently prevailing on a site, even though those conditions might be quite different in different parts of Europe; populations as a whole may not be able to respond as quickly to new conditions as had been thought, however. This highlights the need for local habitat management, to ensure populations are as resilient as possible.

As the data set continues to grow, so will our ability to tease apart the patterns contained within it, improving our knowledge of the issues facing bird populations today. We can finish recording the details on that Blue Tit and enjoy our first coffee, knowing that our early morning efforts help, in a small way, our understanding of how to make the world a better place for our birds.



Each dot represents a site that contributes to the analysis; the darker the dot, the longer the site has been operational.

NIGHTINGALE

Some of the species commonly caught across continental Europe might be a little unexpected. In France and Spain, Melodious Warbler makes it into the top 10, as does Nightingale. This is particularly poignant as, whereas we were able to produce a national CES trend for Nightingale until 2001, now it is caught (in small numbers) on only a handful of sites.

Using your data

This feature highlights some of the scientific papers that have been produced using the data that you collect through the Ringing Scheme and the Nest Record Scheme.



Pied Flycatcher, by John Harding/BTO; Wood Warbler & Whinchat by Edmund Fellowes/BTO

NO EFFECT OF GEOLOCATORS ON PIED FLYCATCHERS

Geolocators are proving an increasingly popular method of studying migration. These relatively cheap devices record information, about light levels and time of day, which can reveal the bird's location during migration once the device has been retrieved. Miniaturisation of geolocators means that they can now be fitted on small passerines, using a Rappole harness, but understanding the possible negative impacts of geolocators on welfare is essential. This study looked at the effects of fitting 0.32-g tags on male Pied Flycatchers in Devon. Short-term impacts were assessed by comparing the rate of nestling feeding visits by tagged males and a control group of untagged birds with a similar capture history, while long-term effects were measured by comparing the return rates and arrival dates of both groups of males in the following spring. The researchers found no differences between groups in relation to any of the potential impacts monitored. They conclude that fitting lightweight geolocators to small passerines can be safe, but that tagging studies of new species should incorporate a control group to test for potential problems.

Bell, S.C. et al. (2017) No short- or long-term effects of geolocator attachment detected in Pied Flycatchers *Ficedula hypoleuca*. *Ibis* **159**, 734–743.

IDENTIFYING NEST PREDATORS OF WOOD WARBLERS

British Wood Warblers have undergone a serious decline over many decades and are now largely restricted to upland woods. Nest predation has been mooted as a possible factor in their decline, and this study monitored 434 nests in Mid Wales, Devon and the New Forest to examine breeding success in relation to vegetation and nest concealment. Half of the nests (51%) failed to fledge any young, mostly due to predation (42% of all nests). Cameras at 144 nests showed that the major culprits in all regions were birds, particularly Jays and Buzzards, and avian predators accounted for 45% of predation. Badgers, small rodents (including Grey Squirrel) and Foxes were the most significant mammalian predators, and two nests were predated by Adders. Nests were slightly more successful when situated among greater ground cover but vegetation management was thought unlikely to have a strong-enough effect on predation to assist Wood Warbler conservation, except in extreme cases of sparse cover, e.g. resulting from over grazing. In the New Forest, where grazing pressure is severe, the probability of nest predation was high enough (72%) to threaten local populations.

Bellamy, P.E. et al. (2018) Nest predation and the influence of habitat structure on nest predation of Wood Warbler *Phylloscopus sibilatrix*, a ground-nesting forest passerine. *Journal of Ornithology* **159**, 493–506.

NEST MONITORING BEST PRACTICE FOR WHINCHATS

Nest recorders are always careful to minimise disturbance so as not to influence nest outcomes and bias the data they are recording. The very act of visiting a nest has the potential to influence bird behaviour and could leave clues to attract predators, and so it is vital to understand and minimise these risks to ensure safe and reliable nest studies. To address this question, researchers studying breeding Whinchats on Salisbury Plain split their nest sample into two groups of high- and low-intensity nest checks to compare the nest survival rates. They found that the survival of nests examined every two days during the egg phase was no different to that of nests that were checked only from a distance so as to avoid disturbance until the expected hatching date. Furthermore, nest checks during the nestling period disrupted adult feeding visits for a maximum of only 20 minutes, which was considered highly unlikely to affect chick survival. The researchers conclude that visiting nests every two to three days had a negligible effect on Whinchat breeding success, but stress the importance of minimising disturbance in nest studies wherever possible.

Border , J.A. et al. (2018) Nest monitoring does not affect nesting success of Whinchats *Saxicola rubetra*. *Ibis* doi: 10.1111/ibi.12574

Noticeboard

ADVERTS

RINGING OPPORTUNITY IN PORTUGAL

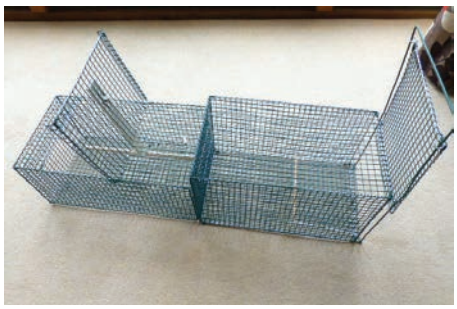
Experienced ringers are needed to ring during autumn migration with A Rocha in the Algarve. A or C ringers are welcome from 1 Sept until 15 Nov 2018 to ring mainly migrating passerines as well as resident species. Trainees may come if accompanied by an A-permit holder. Ringers are responsible for their own travel costs and are asked to pay a reasonable charge for accommodation and full board if required (**www.arocha.pt/en/centre/accommodation/**). Contact Marcial Felgueiras: **portugal@arocha.org**

RINGING OPPORTUNITY IN GAMBIA

Ringing opportunity for experienced A or C ringers in the Gambia on a one- or two-week trip from Nov to Mar. To apply, email: **jez.blackburn@bto.org**

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**



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

2018 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 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**

Ringing Courses

26–29 July: Chew Valley RS Ringing Course, **nr Bristol** / Contact: Bob Medland - FULLY BOOKED

1–5 August: Icklesham Ringing Course, **East Sussex** / Contact: Gary Clewley

9–12 August: Sandwich Bay Bird Observatory Ringing Course, **Kent** / Contact: Ian Hunter

7–10 September: Gower Ringing Course, **Swansea** / Contact: Kelvin Jones

13–16 September: Isle of Wight RG Ringing Course – for all ringers (including experienced trainees) / Contact: Anthony Roberts

CONFERENCES

16–18 November: Scottish Ringers' Conference, Carrbridge, Inverness-shire
7–9 December: BTO Annual Conference, Swanwick, Derbyshire

THE 2018 CES VISIT PERIODS

Visit	First Date		Last Date	No of Days
1	Thursday 3 May	to	Saturday 12 May	10
2	Sunday 13 May	to	Wednesday 23 May	11
3	Thursday 24 May	to	Saturday 2 June	10
4	Sunday 3 June	to	Wednesday 13 June	11
5	Thursday 14 June	to	Saturday 23 June	10
6	Sunday 24 June	to	Wednesday 4 July	11
7	Thursday 5 July	to	Saturday 14 July	10
8	Sunday 15 July	to	Wednesday 25 July	11
9	Thursday 26 July	to	Saturday 4 August	10
10	Sunday 5 August	to	Wednesday 15 August	11
11	Thursday 16 August	to	Saturday 25 August	10
12	Sunday 26 August	to	Wednesday 5 September	11

Monitoring priorities: Little Owl

Although unlisted on the Birds of Conservation Concern due to its status as an introduced species, Little Owl numbers have declined by 57% since Breeding Bird Survey monitoring began in 1995. Read on to find out how you can help our smallest owl species.

Little Owl, by Prashant Meswani/BTO

CURRENT KNOWLEDGE

Little Owl numbers have undergone a steep decline since the mid-1980s. Evidence identifying the cause of the decline in the UK is sparse; however, demographic data from across Europe suggest declines may be linked to falling rates of juvenile survival, possibly due to loss of habitat and changes in farming practices. Current British demographic information comes from limited geographical areas and generally involves small sample sizes, although there is a large-scale project in Lincolnshire.

HOW CAN YOU HELP?

Erect nest boxes

Little Owls will use nest boxes in areas where natural cavities are scarce. As it is a sedentary species, placing a box in an area with a known territory will usually be more successful than trying to attract the species to a previously unused area. Recent research has shown that Little Owls respond well to sound lures, so this method can be used to locate territories and guide placement. Little Owls will use large boxes with a 70-mm hole, or chimney-type boxes, but prefer boxes with a tunnel-style entrance and a dark nesting chamber, which can be created via the use of baffles. Boxes can be sited at any height providing it is free from predation and interference by humans or grazing cattle. In the past five years, between 150 and 200 nest records have been received each year for Little Owl, with between 340 and 500 pulli ringed annually.

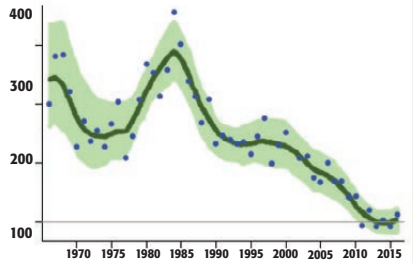
Start a RAS

Little Owl is a priority species for RAS. Although this species can take quite readily to nest boxes, their breeding territory size (35+ hectares) means that a successful project will require a large study area. They are, however, easy to catch as they tend to remain in the box when it is checked. Currently, there is only one active RAS on Little Owl; 61 of the 66 adult Little Owls ringed in 2016 were ringed through this project. Additional projects would therefore help to provide a better understanding of survival rates on a national scale.

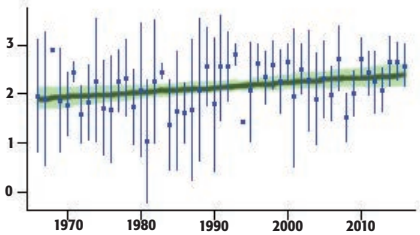
Project Owl

We plan to use funds from the BTO Owl Appeal to improve our knowledge of Little Owls, to increase the amount of demographic data collected and the geographical range of local studies. The Appeal is going well but we have some way to go to reach our target. Find out more at **www.bto.org/project-owl**

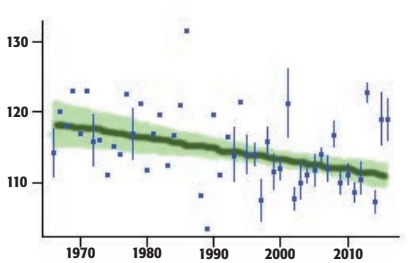
CBC/BBS index UK 1966–2016



Fledglings per breeding attempt 1966–2016



Laying date 1966–2016



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