Is low breeding success the cause of the decline of Lesser Spotted Woodpeckers in the UK?

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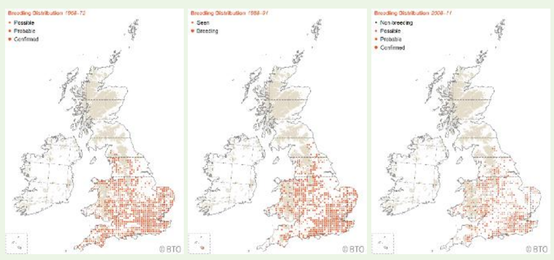
1. Catastrophic decline

Lesser Spotted Woodpeckers *Dryobates Minor* have been in decline throughout their British range since 1979. By 2000, the numbers had become too low to be monitored by national surveys. The chart shows the population index derived from BTO Common Bird Census 1966-1999 (orange line) and a new estimate derived from national bird ringing records, the ratio of Lesser Spots ringed to the number of woodland birds ringed each year from 1966 to 2017 (blue line) extending the national trend line beyond the end of formal monitoring. Both indices set at 100 in 1998. This and the National Atlas distribution maps for survey periods 1968-72, 1988-91 and 2008-11, (British Trust for Ornithology) show the extent of the problem.

Reasons for the decline are not yet fully understood.



Flying like a mini Concorde - multiple exposure photo of a Lesser Spot leaving its nest in low intensity farmland in Herefordshire. The 2018 nest was low in a dead Willow overhanging a stream. © Nick Gates.

2. Studies in the UK

RSPB (E Charman & K Smith) studied breeding success in three areas of mature woodland (New Forest, Wyre Forest and Sheffield) from 2007-2009. Productivity (mean number of fledglings per nesting attempt) **was less than half that found in studies in Sweden and Germany**. Most nest failures were associated with nest desertion and chick starvation after an adult stopped provisioning.

Formation of the LesserSpot Network: 2015 – ongoing

Following the cessation of funding by RSPB, there was little work on Lesser Spots in UK until 2015 when Ken and Linda Smith launched LesserSpotNet, a citizen science project to support volunteer birdwatchers nationally to find and monitor nests and pool the results. A website www.woodpecker-network.org.uk and twitter are used to promote the cause of Lesser Spots and encourage systematic recording of breeding attempts. This has resulted in the national nest record reporting rising from 1 per year to about 12. LesserSpotNet provide nest inspection cameras with telescopic poles to help record breeding outcomes. From 2015-2018 volunteers found 45 nests and 39 were monitored. Compared to the RSPB studies**, breeding success (proportion of nests fledging one or more young) was higher in most years**, up from 0.59 to 0.89, although brood size is still low compared to continental Europe.

Study area	Sweden	Germany	England	England/Wales
Researcher	Wiktander	Rossmanith	Charman *et al.*	Smith & Smith
Date published	2001	2007	2012	2015-18
Sample size: nests	124	31	27	39
Study duration: years	10	6	3	4
Clutch size (1)	5.9	5.4	5.2	5.0
Productivity (2)	3.5	n/a	1.4	2.6
Brood size (3)	4.6	3.6	2.8	3.0
Breeding success (4)	0.80	0.74	0.59	0.89
Nest survival (5)	n/a	n/a	0.52	0.82
Commonest cause of nest failure (% of observed failures)	Desertion by one/both adults (59%)	Avian nest predation (63%)	Chick starvation, loss of one/both adults (55%)	Great Spotted Woodpecker predation (75%)

1 - Clutch size: mean number of eggs; 2 - Productivity: mean number of fledglings per nesting attempt; 3 - Brood size: mean number of fledglings per successful nest; 4 - Breeding success: proportion of nests fledging one or more young; 5 - Nest survival: derived from Mayfield analysis of daily nest success

Eggs & young at day 1, 5 and 10 after hatching

Ken with camera & poles viewing nest

Young, 2 ♂ and ♀, in nest in New Forest

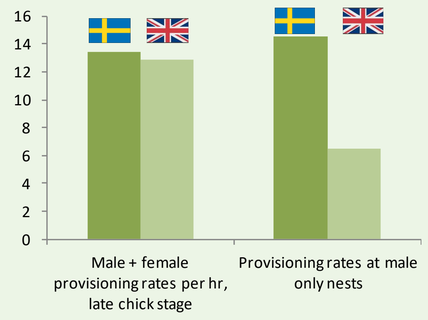
Images from cavities using cameras on telescopic poles linked to a tablet, revealed fascinating information on clutch size, brood size and sex ratios. At fledging, the red heads of males are visible.

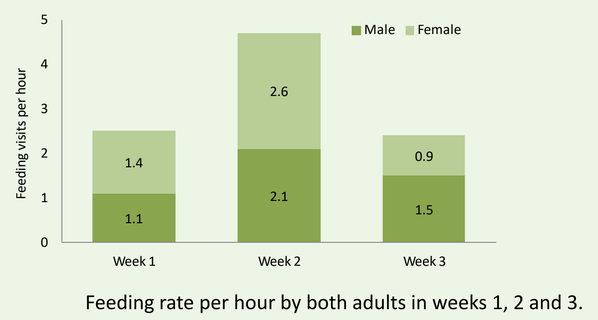
3. Understanding the causes of decline – provisioning rates

For many woodpecker species where there is plentiful food, the female often stops feeding the young after a few days and the male provisions the chicks alone. This system can give rise to polyandry which is known to occur with this species. For this system to work, the male must compensate for loss of the female by increasing feeding rates.

In the **RSPB study**, **males appeared unable to compensate** and nests failed when nests were deserted/chicks starved. The figure below (left) compares the provisioning rates in the Swedish and RSPB studies.

For the majority of nests found by **LesserSpotNet both males and females were feeding right up until fledging**, perhaps implying low food availability. Volunteers (Mat Shore and Ricky Cleverly) tracking one nest in East Anglia observed maximum feeding rates of 4.7 visits per hour, only a fraction of the rate in the previous Swedish and RSPB studies (typically 12 visits per hour). But the nest was successful, fledging four young. The figure below (right) shows male and female feeding rates in weeks one to three.





Feeding rate per hour by both adults in weeks 1, 2 and 3.

4. Has breeding success improved?

Through the continuation of studies over several years, breeding success does appear to be low, but not as disastrously low as we first thought . Why?

Habitat differences: RSPB studies were in three large, mature forest blocks, by contrast the LesserSpotNet nests were found in a wider geographic area and often surprising, random locations, including the edge of a housing estate, a small woodland, open parkland and alongside a busy cycle path. A commonality is an association with streams or other wet features, see nest site photo. There may be differences in food availability or other factors between these habitats.

New Forest nest site

Nest in Sussex

Weather: The low breeding success in RSPB study was exacerbated by bad weather at a critical time in 2007 particularly.

Nest finding bias: There is a possible bias in the LesserSpotNet results as nests were generally found late in the season and early failures are likely to be missed.

Local extinction: a LesserSpotNet volunteer, Andy Sims monitored a site on the outskirts of Lincoln City where in 2015 a pair nested successfully (4 young fledged). In 2016 the female disappeared (possibly predated) on 21 April but the male successfully raised 3 chicks alone. In 2017 the male excavated a new hole in the nest tree, but no female was seen. The male remained at the nest site calling and drumming for 6 weeks. The male returned in 2018 but still found no mate and is back on site in 2019 – is this local extinction in action?

5. Conclusions

Intensive studies by RSPB indicated low breeding success associated with low provisioning rates. However, the study was only for 3 years and affected by poor weather. With the species spread so thinly it is now not viable to have a funded project. Using citizen science and volunteers to collect more data on this now very rare and range restricted species through LesserSpotNet has resulted in a significant increase in the annual reporting rate of nesting pairs. Analyses to date suggest a higher level of breeding success, highlighting the importance of long-term studies. Data will continue to be pooled and analysed in order to improve our understanding of the species and its decline.

References & acknowledgements: ***The RSPB research*** was funded by RSPB and Natural England and has been published as follows: Smith & Charman, 2012, British Birds , Charman *et al.* 2010, Ibis. Charman *et al.,* 2012a, Bird Study, Charman *et al*., 2012b, Ornis Fennica. ***Other references***: Wiktander *et al*, 2001, *Ibis* 143: 72-82 *;* Rossmanith *et al*, 2007, *J Ornithol:* 148: 323-332. Thanks to British Trust for Ornithology for use of population & ringing data. ***Special thanks*** to all the LesserSpotNet volunteers who found & observed nests and those who searched in vain. **LesserSpotNet** is an independent network of volunteers co-ordinated (and funded) by Ken & Linda Smith through the website www.woodpecker-network.org.uk and Twitter @LesserSpotNet

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