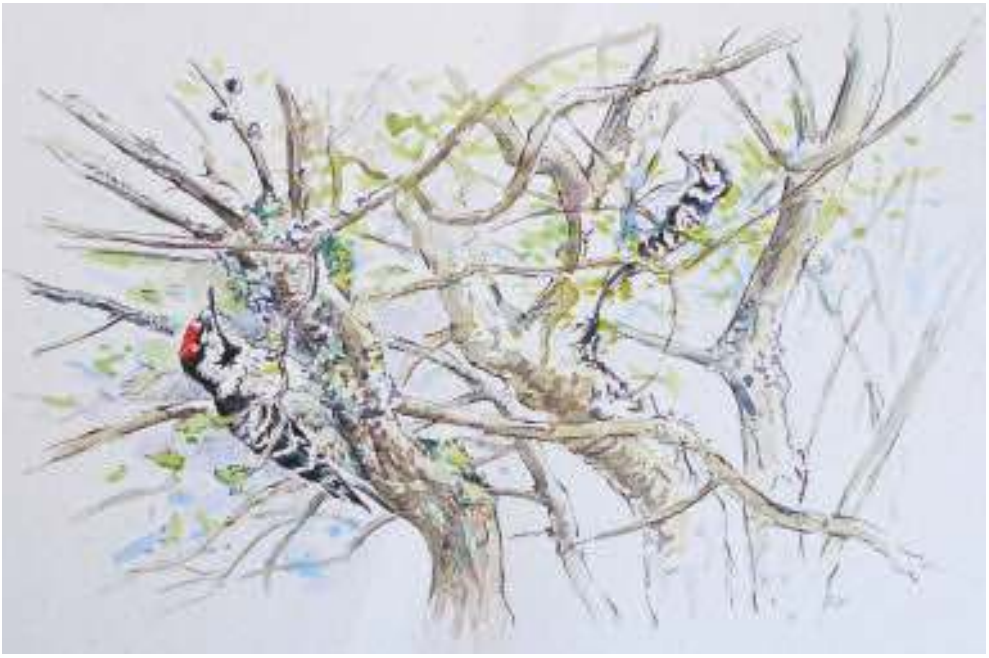
Conservation priority species

The ecology and conservation of the Lesser Spotted Woodpecker

Ken W. Smith and Elisabeth C. Charman



Dan Cole

A pair of Lesser Spotted Woodpeckers *Dendrocopos minor* displaying in early spring

Abstract The Lesser Spotted Woodpecker *Dendrocopos minor* is in serious decline in Britain and in many other countries in northwest Europe. In this paper we review the recent research on the species in Britain and elsewhere in Europe, and discuss the conservation implications of this work. The breeding success of Lesser Spotted Woodpeckers in Britain is currently lower than reported previously and is also lower than that found in recent studies in Germany and Sweden. The proximate cause of this low breeding success appears to be chick starvation but more work is needed on the ecology of the species in the pre-breeding and breeding periods to identify the ultimate cause.

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Introduction

The Lesser Spotted Woodpecker *Dendrocopos minor* breeds across the Palearctic region from northwest Europe in the west to Kamchatka in the east. Eleven subspecies have been recognised, based on plumage and size differences, but those of most relevance to Britain are *D. minor comminutus* (confined to Britain), the nominate *D. minor minor* (from Scandinavia eastwards) and *D. m. hortorum* (on the near continent; del Hoyo *et al.* 2002). All populations of Lesser Spotted Woodpecker are largely sedentary, although irruptive movements have been reported in Scandinavia in some years (Wiktander 1998; Gohli *et al.* 2011).

In Britain, the Lesser Spotted Woodpecker is restricted to England and Wales with the most northerly breeding birds reaching north Lancashire in the west and Northumberland in the east (Gibbons *et al.* 1993). The British population has undergone significant changes during the last 50 years and for the majority of birdwatchers in Britain it is now a rare sight, although this was not always the case. In the late 1960s it was one of the species that benefited most from the spread of Dutch elm disease (Osborne 1982) with at least one report of local population increases linked to dying elms *Ulmus* (Flegg & Bennett 1974). The fungus that resulted in the death of the elms was spread from tree to tree by bark beetles (Scolotydae), which provided a superabundant food resource for the woodpeckers, which in turn were also able to excavate nesting cavities in the dead trees. Within a decade, mature elms had disappeared from the landscape in much of southern Britain, although young trees continue to regenerate from suckers in many areas. In most of its British range, the Lesser Spotted Woodpecker is now a very scarce bird with only a few localities where it can be found with any reliability. Preliminary results from Bird Atlas 2007–11 made available to us when finalising this paper show around 30% fewer occupied 10-km squares than in the 1988–91 Atlas (Gibbons *et al.* 1993). The declines have occurred across the whole British range, though more especially to the north, the west and, particularly, in East Anglia, with the net result of a distinct heartland now in southeast England and the Home Counties.

The British Lesser Spotted Woodpecker population peaked in 1979 and then declined until 2000, when numbers became too low for the species to be monitored by the national BTO/JNCC/RSPB Breeding Bird Survey (Baillie *et al.* 2010). This pattern was confirmed by large-scale resurveys in 2003–04 of 406 woodlands first surveyed by the BTO and RSPB in the 1980s and earlier (the Repeat Woodland Bird Survey; see Amar *et al.* 2006, Hewson *et al.* 2007). Between the 1980s and 2003–04, Lesser Spotted Woodpeckers had declined by 44% (on BTO-surveyed sites) and 59% (on RSPB-surveyed sites). Those sites surveyed by the BTO in the 1960s, 1970s, 1980s and 2003–04 also showed the pattern of increases to the 1970s and 1980s followed by a sharp decline since.

The Lesser Spotted Woodpecker is such an unobtrusive species that population estimates have always been little more than educated guesses based on atlas distributions (Sharrock 1976; Gibbons *et al.* 1993) and likely breeding densities. The most recent estimate for Britain was 1,400–2,900 pairs (Baker *et al.* 2006) but this should be treated with considerable caution. In 2011 the species was added to the list of species monitored by the UK Rare Breeding Birds Panel (Holling *et al.* 2011), a consequence of the fact that numbers are now so low that this is now the only way to provide effective monitoring. It is also on the Red list of Birds of Conservation Concern 3 because of its severe decline in recent decades (Eaton *et al.* 2009).

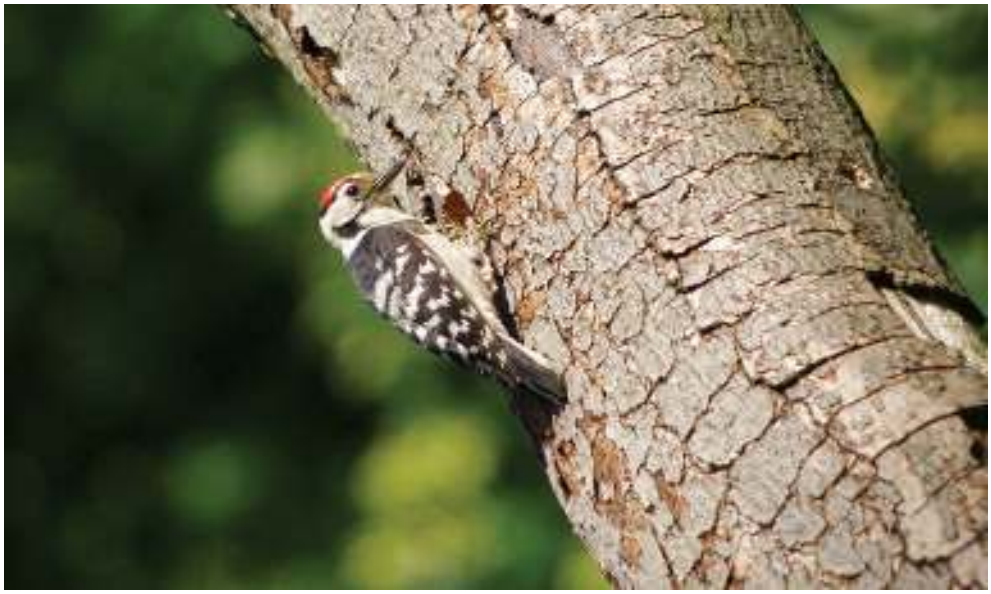
The status of Lesser Spotted Woodpecker elsewhere in Europe is less clear. It is listed by BirdLife International as a non-SPEC species with favourable status (BirdLife International 2004) whereas declines have been reported from Sweden, Finland and locally in Germany (Olsson 1988; Nilsson *et al.* 1992; Höntsch 2004). In a compilation of population trends for European countries between 1970 and 1990, Mikusiński & Angelstam (1997) showed that the Lesser Spotted Woodpecker had declined in 41% and increased in only 6% of the 32 countries considered. The Pan European Common Bird Monitoring Scheme reports declines of 75% between 1980 and 2009 and of 58% between 1990 and 2009 (PECBMS 2011) but, because of difficulties in producing the combined index for Lesser Spotted Woodpecker, classifies these trends as uncertain.

Large-scale habitat usage

The Lesser Spotted Woodpecker is categorised as a 'specialised forest insectivore' (Roberge *et al.* 2008) and, together with the Middle Spotted Woodpecker *D. leucotos*, is considered an indicator of mature broadleaved forests in Europe (Török 1990; Mikusiński & Angelstam 1997; Mikusiński *et al.* 2001). A large-scale survey in Sweden found that they were most likely to be found in census plots with large areas of nemoral deciduous woodland (in Sweden, nemoral woods are defined as woods mostly dominated by oaks *Quercus robur/petraea* but also including Beech *Fagus sylvatica*, Ash *Fraxinus excelsior*, Small-leaved Lime *Tilia cordata*, Wych Elm *Ulmus glabra*, Norway Maple *Acer platanoides* and Hornbeam *Carpinus betulus*) and riparian deciduous woodland fringing lakes and rivers (Wiktander *et al.* 1992). In floodplain forests of the Rhine and Danube, Spitznagel (1990) and Riemer (2009) found that they were associated with old-growth deciduous forests, particularly in the wetter areas where willows *Salix*, alders *Alnus* and birch *Betula* were present. Similarly, in deciduous forests of northeastern Switzerland, woods with decayed trees of alder, Ash, lime *Tilia* and poplar *Populus* near to lakes and rivers were selected (Miranda & Pasinelli 2001). Tobalske & Tobalske (1999) used atlas data to model the distribution of woodpeckers in the Jura region of eastern France and found that Lesser Spotted Woodpeckers were associated with mature deciduous woodland and coppice at low altitudes. In Belgium, Lesser Spotted Woodpeckers selected stands with a high percentage of oak cover and a high density of dead wood (Delahaye *et al.* 2010). In the mixed landscape of the low Taunus Mountains of Germany, Höntsch (2004) found that in the pre-breeding and breeding seasons, although all wooded areas were used, there was strong selection for the use of orchards.

It appears that the wet woodlands are selected for their high density of dead trees rather than wetness per se (Reimer 2009). In the case of orchards, it is the mature dead and dying trees that appear to be important (for nest-sites), with little evidence of the birds foraging in the orchards themselves (Höntsch 2004; ECC pers. obs.).

In an analysis of BTO nest record cards submitted up to 1989, Glue & Boswell (1994) found that, of the 122 cards, approximately 50% were from nests in woodland (mainly deciduous), 20% from farmland and 14% from parks and gardens. Charman *et al.* (2010) found that in both the 1980s and 2007, Lesser Spotted Woodpeckers in England were found in open, mature-oak-



Stuart Clewlow

165 & 166. Male and female Lesser Spotted Woodpecker *Dendrocopos minor* at nest-site in Hertfordshire, May 2011.

dominated woodlands. Associations with high numbers of dead limbs on trees and wet features found in the 1980s were no longer significant in 2007. In 2007 the strongest variable was the area of broadleaved woodland within 3 km, implying that in England Lesser Spotted Woodpeckers are now most likely to be found in highly wooded landscapes. Using the dataset from the Repeat Woodland Bird Survey (Amar *et al.* 2006; Hewson *et al.* 2007), Smart *et al.* (2007) found that Lesser Spotted Woodpeckers were more likely to be present in oak-dominated woodlands with intermediate canopy cover and high numbers of dead trees.

Fine-scale habitat use and foraging

There have been a number of studies looking at habitat selection at the scale of the individual foraging bird. For most of the year, Lesser Spotted Woodpeckers forage on invertebrates found in dead wood (Glutz & Bauer 1994; Cramp *et al.* 1985), which they obtain by pecking and excavating on dead branches or ripping off fragments of dead bark (scaling). During the short breeding season, like many other woodland birds, they take advantage of the spring abundance of invertebrates and switch to gleaning lepidoptera larvae and other invertebrates from the foliage and surfaces of the branches (Török 1990; Olsson 1998, Wiktander 1998; Rossmanith *et al.* 2007).

Hogstad (1978, 2010) found that in the Norway Spruce *Picea abies* forests of Norway, Lesser Spotted Woodpeckers foraged almost exclusively on broadleaved trees (birch, Grey Alder *Alnus incana*, Aspen *Populus tremula*, Goat Willow *Salix caprea* and Rowan *Sorbus aucuparia*), which were scattered through the forest. In winter they foraged by scaling, pecking and probing on dead birch and alder branches less than 10 cm in diameter, on dead and living trees. In the pre-breeding and breeding seasons all the broadleaved species were used, with more foraging on live branches and more gleaning of prey.

Some of the most comprehensive and valuable studies of Lesser Spotted Woodpeckers have been carried out by Ola Olsson and Ulf Wiktander in the mixed forests of southern Sweden (for summaries see Olsson 1998 and Wiktander 1998). As in Norway, territories were associated with patches of broadleaved trees within conifer-dominated forests (Olsson *et al.* 1992) and the birds foraged on small-diameter (<5 cm) dead branches where they preyed mainly upon the larvae of small longhorn beetles (Cerambycidae). The foraging tree species preference varied greatly from year to year and was determined by the relative prey availability in

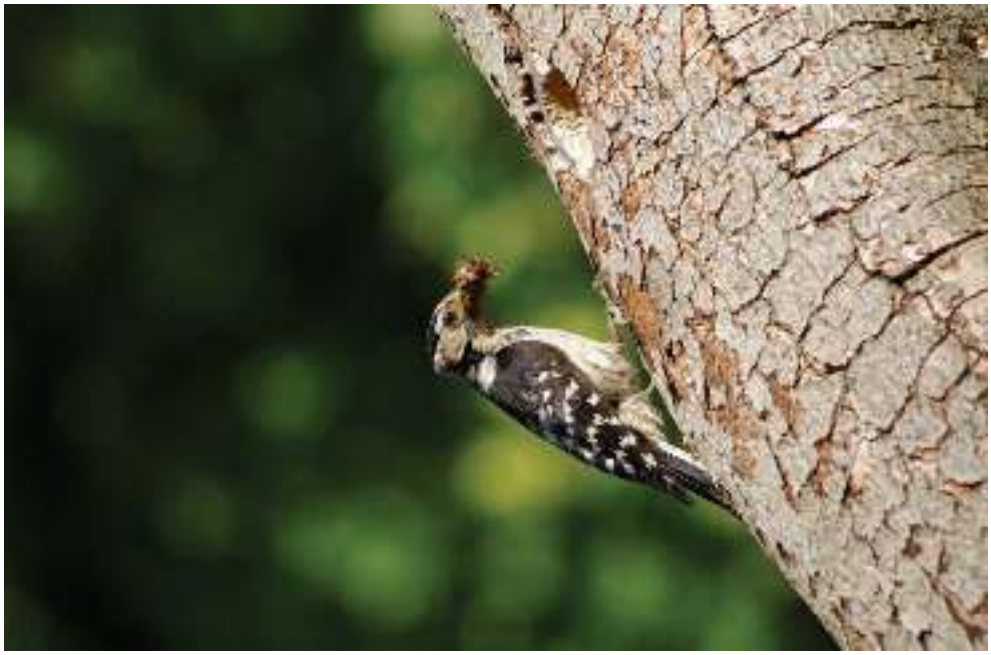


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Table 1. Nest tree species used by Lesser Spotted Woodpeckers *Dendrocopos minor*.

	Worcestershire	Britain	Hertfordshire	Worcestershire, New Forest, Sheffield	Poland	Poland	Norway	Norway	Sweden	Germany
	Winnall 2001	Glue & Boswell 1994	Smith 2007	Charman *et al.* 2012a	Wesołowski & Tomiałojć 1986	Kosinski & Kempa 2007	Hågvar *et al.* 1990	Stenberg 1996	Wiktander 1998	Höntsch 2004
birch *Betula*	6	22	2	4			17		95*	
alder *Alnus*		17		4	9	1	13	2		
willow *Salix*		14		1						Y
Aspen *Populus tremula*				1			20	9		Y
Poplar *Populus*				1						
Rowan *Sorbus aucuparia*			1							
fruit trees		17		5						Y
elm *Ulmus*		14	3	1						
oak *Quercus*		7	6	7		1				
Ash *Fraxinus excelsior*			2		4					
Beech *Fagus sylvatica*		6	1	2						
Hornbeam *Carpinus betulus*					6	2				
Small-leaved Lime *Tilia cordata*				1						
Sweet Chestnut *Castanea sativa*		4								
other		21	1							
TOTAL	**6**	**122**	**16**	**27**	**19**	**4**	**50**	**11**	**116**	**33**

* Wiktander (1998) reported 95 out of 116 nests in birch and alder with six other unspecified species used for the remaining nests. Nests in the Höntsch 2004 study were in willow, Aspen and fruit trees but that the numbers of each were not specified.

the four species groups considered – birch, alder, oak and lime (Olsson *et al.* 2001). In some years, when they flowered, birch and alder trees held high numbers of larvae of the micro moth *Argyresthia goedarthella*, which feed in the cambium of live stems and were heavily preyed upon by Lesser Spotted Woodpeckers. In other years the woodpeckers focused on dead-wood invertebrates.

Steve Dodd

167. Lesser Spotted Woodpecker nest tree (a live sallow *Salix*; hole upper/right centre), Worcestershire; nest found at chick stage, one chick fledged successfully.

By radio-tagging their birds, Wiktander *et al.* (2001b) were able to determine home ranges at different seasons. Remarkably for such a small bird, the mean home range in winter was 742 ha, falling to 355 ha in early spring, 103 ha in late spring and 43 ha when nesting. The defended territory of late spring included an average of c. 40 ha of preferred foraging habitat. Slightly lower figures were reported from Germany: 211 ha in winter, 192 ha in the pre-breeding period and 45 ha during nesting (Höntsch 2004). Given these enormous home-range areas, it is not surprising that most birdwatchers find it difficult to pin down Lesser Spotted Woodpeckers.

Results from mixed northern forests contrast with Lesser Spotted Woodpecker ecology in more temperate broadleaved woods. For instance, in oak woodlands in southern England, Smith (2007) reported that Lesser Spotted Woodpeckers showed no selection for foraging on dead trees or dead branches but did favour small-diameter branches high in the trees. Similarly, Charman *et al.* (2012b) found that in the pre-breeding period 80% of foraging observations were on oak trees, with the birds gleaning, pecking and scaling on mainly live branches.

Breeding density and nest-site selection

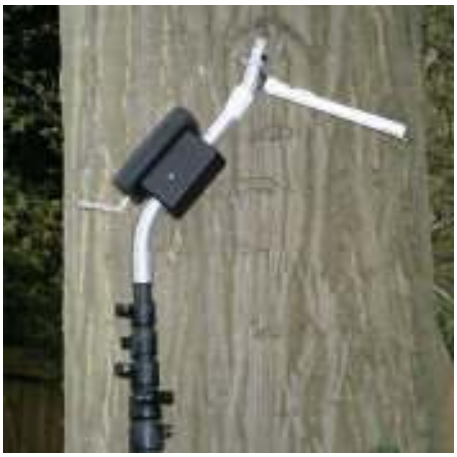
Large-scale surveys of breeding Lesser Spotted Woodpeckers in a variety of situations in Europe give ranges of densites of 1.2–3.6 pairs per 100 ha, findings that are in very close agreement with the home-range results from Sweden and Germany (Wesołowski & Tomiałojć 1986; Spitznagel 1990; Stenberg & Hogstad 1992; Winnall 2001; Kosiński & Kempa 2007; Riemer 2009). In exceptional circumstances, higher densities have been reported. For instance, a 52-ha wood in Kent, which normally held 1–3 pairs, was reported to hold 15 pairs while the trees were dying from Dutch elm disease (Flegg & Bennett 1974), although numbers have now fallen to zero.

It is perhaps not surprising, since it is the smallest woodpecker in the region, that the Lesser Spotted Woodpecker invariably excavates its nest cavity in soft substrates. Depending on the species of tree, this can be a standing dead stump or a dead branch on a living tree. A new cavity is normally excavated each year. The tree species used for nesting are summarised in table 1 and to some extent these reflect the site-specific species availability. In northern forests, dead Aspen, birch and alder are the main nesting trees whereas in more temperate areas dead limbs on species such as oak, Ash and Beech are also used. In Britain, elms were and continue to be used and there is also substantial use of fruit trees in orchards (cherry *Prunus*, apple *Malus* and pear *Pyrus*), which has also been reported from Germany.

Determining the breeding success of Lesser Spotted Woodpeckers. BOX 1

Lesser Spotted Woodpeckers often nest in difficult locations – on dead branches high in living trees and in standing dead trees. Climbing to such nests is usually out of the question and would in any case be likely to cause considerable disturbance. To enable us to see into the nesting cavity quickly and safely without having to climb the tree, we developed a video system comprising a miniature video camera, LED lamps and radio link (Wildlife Windows Ltd) all mounted on a long telescopic pole (Smith *et al.* 2006). This can be inserted into the entrance hole to look down into the cavity and is small enough to fit even into the diminutive nest of the Lesser Spotted Woodpecker. The images are recorded on a Portable Video Recorder to be viewed later.

The photographs on this page show the nest camera, and the authors using the system in the field, inspecting a low and a high nest. On the opposite page, are three videograbs showing a cavity with four eggs, four recently hatched young and four young about to fledge.



168. The nest camera. The viewing head on the right goes into the nest hole. The black box contains the batteries and a small radio link to transmit the pictures to the portable video recorder. The telescopic carbon fibre poles allow high nests to be inspected. *Ken Smith*

169. ECC checking a low cavity in dead Beech *Fagus sylvatica* tree. *Anne Heath*

170. KWS checking a nest high in a live oak *Quercus* tree, April 2010. The nest is close to the top of the photo frame. *Linda Smith*

Determining the breeding success of Lesser Spotted Woodpeckers. *cont.*

BOX 1

Three videograbs of a Lesser Spotted Woodpecker nest cavity, in Worcestershire in 2008, show eggs, recently hatched young and near-fledged youngsters.

171. Lesser Spotted Woodpecker nest cavity with four eggs; 2008. *Steve Dodd*/RSPB

172. Four recently hatched young; note the eggshells still present in the nest. *Steve Dodd*/RSPB

173. Four young within a few days of fledging and now with red crown feathers; also, at the bottom of the frame, the adult female. *Steve Dodd*/RSPB

Breeding success, parental care

The low breeding density and difficulties of finding nests and subsequently viewing the contents means that there have been rather few studies of breeding success of Lesser Spotted Woodpeckers and most of these have involved small sample sizes. The breeding parameters found in the four key published studies and two other unpublished studies are summarised in table 2. Two features in particular are noteworthy. Firstly, for such a small bird that is essentially single-brooded, the Lesser Spotted Woodpecker has a relatively low productivity – for instance 3.5 fledglings per nesting attempt in Sweden and in the UK up to 1989. Secondly, the productivity found in recent RSPB studies (Charman *et al.* 2012a) is less than half this figure at 1.4 fledglings per nesting attempt. Similar low figures have been found by Smith (unpubl.) for 13 nests in Hertfordshire between 1985 and 2011 (estimated 1.6 fledglings per nesting attempt).

The causes of breeding failures varied among studies. Nest predation by avian (Great Spotted Woodpecker *Dendrocopos major*, Eurasian Jay *Garrulus glandarius* and Magpie *Pica pica*) and, occasionally, mammalian predators which leads to complete nest failure was found to be important in two studies (Rossmanith *et al.* 2007; Smith unpubl.). In Sweden, Wiktander *et al.* (2000) found that the disappearance of one the adults during the nesting period invariably led to nest failure. Recent work by the RSPB (Charman *et al.* 2012a) found that most nest failures were associated with chick starvation, often linked to poor weather conditions or the cessation of feeding by one of the adults (usually the female) and the apparent inability of the remaining adult to provide sufficient food for the chicks. In this study a few failures were the result of predation of chicks by Great Spotted Woodpeckers, which may have also been linked to food shortage and chick starvation.

It is normal in the Lesser Spotted Woodpecker for males to incubate the eggs at night and to take a larger share in feeding the young, particularly in the later stages of chick rearing. In Sweden (Wiktander *et al.* 1994, 2000, 2001a) and Germany (Rossmanith *et al.* 2009), nests where only one of the adults

was feeding the young were still successful whereas in recent studies in Britain such nests had a very high probability of failure (Charman *et al.* 2012a). In Sweden, the males that were feeding the young on their own were able to increase their feeding rate to compensate for the loss of the contribution from the female whereas in Britain this did not seem to be the case and there was a high chance of the chicks starving. In Sweden, Wiktander *et al.* (2001a) also found that a significant proportion (9%) of pairs excavated a nest cavity but failed to lay any eggs, but there are no comparable data for other countries.

Olsson *et al.* (1999) found that birds in territories with good feeding conditions in the pre-breeding period were able to nest earlier than other pairs, which resulted in more fledged young per nesting attempt. Even though the birds fed their young mainly on defoliating caterpillars (Wiktander *et al.* 2001a; Rossmanith *et al.* 2007), the earlier nesting meant they were better synchronised with the peak of caterpillar availability.

In Sweden, 78% of nesting attempts were by monogamous pairs and there was very strong site and mate fidelity from one year to the next (Wiktander *et al.* 2000). However, 16% of nesting attempts were polyandrous (one female mated to more than one male) and 6% were polygynous (one male with more than one female). The rate of polyandry in Germany was 19% (Rossmanith *et al.* 2009). In Sweden (and presumably Germany) the proximate cause of polyandry was thought to be unequal sex ratios in the population because of differences in survival of males and females (see next section). However, in Spain two cases of polygyny were reported which appeared to be the result of disruption of an established population by extensive forestry operations, leading to a shortage of potential nest-sites (Romero & Pérez 2008; Romero *et al.* 2010).

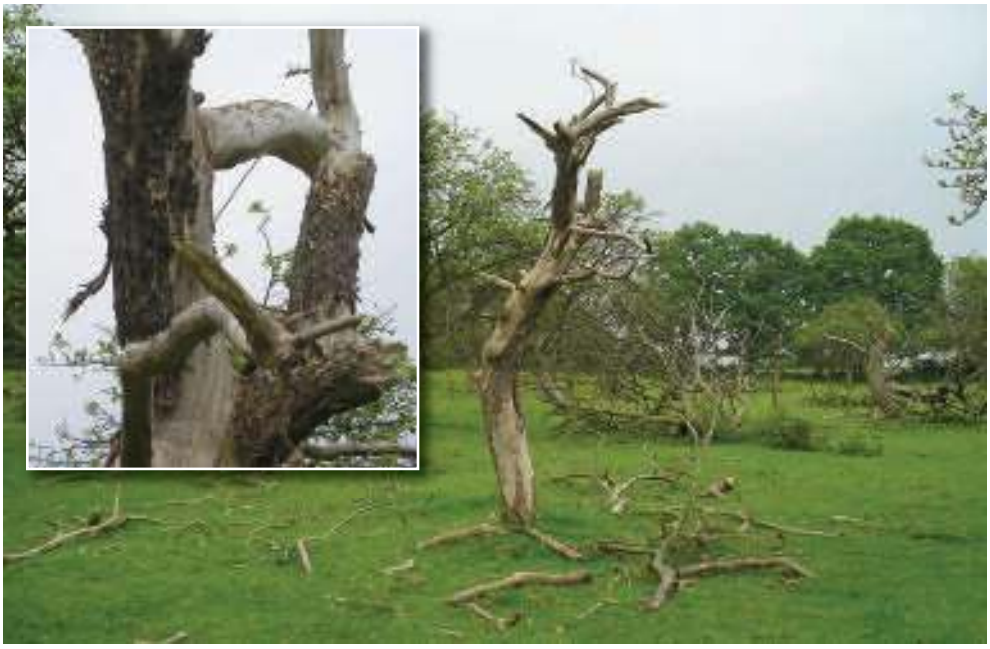
Survival and population modelling

For such a small bird the annual survival rates of Lesser Spotted Woodpeckers are relatively high. Wiktander (1998) reported a mean survival rate of 0.59 and, although there was considerable annual variation, in most years

Table 2. Comparison of key breeding parameters reported from studies of Lesser Spotted Woodpeckers *Dendrocopos minor* in Britain and elsewhere in Europe. Figures ± SD are given where available. N/A: not available.

	UK	England	England	England	Sweden	Germany
	Glue & Boswell (1994)	RSPB pilot study 2005–2006	Charman *et al.* (2012a)	Smith (unpubl.) 1985–2011	Wiktander *et al.* (2001)	Rossmanith *et al.* (2007)
Sample size	129	6	27	13	124	31
Project duration (years)	40	2	3	N/A	10	6
Clutch size[1]	5.2	N/A	5.2 ± 1.2	N/A	5.9 ± 0.3	5.4
Productivity[2]	3.5	N/A	1.4 ± 1.7	1.6	3.5	N/A
Brood size[3]	4.2	N/A	2.8 ± 1.4	3.7	4.6 ± 0.8	3.6
Breeding success[4]	N/A	0.50 ± 0.55	0.59 ± 0.55	0.75	0.80 ± 0.22	0.74
Nest survival[5]	0.83	0.67	0.52	0.44	N/A	N/A
Commonest cause of nest failure (% of observed failures)	N/A	Loss of one or more adults (67%)	Loss of one or more adults (55%)	Avian nest predation (67%)	Desertion by one or more adults (59%)	Avian nest predation (63%)

[1] The mean clutch size based on the maximum number of eggs recorded in each nest; [2] mean number of fledglings produced per nesting attempt; [3] mean number of fledglings from successful nests; [4] proportion of nests fledging one or more young – derived from raw figures; [5] the nest survival derived from Mayfield analysis of daily nest success.



Steve Dodd

174. Lesser Spotted Woodpecker nest in a dead apple *Malus* tree, at an orchard site in Worcestershire; nest found at egg stage, five chicks fledged successfully. Inset shows close-up of the nest hole.

males survived better than females. In Sweden, annual survival was the best predictor of population fluctuations from one year to the next. In Germany, Rossmanith *et al.* (2007) reported a similar figure of 0.60. By analysing when colour-ringed birds disappeared from his study population, Wiktander (1998) was able to show that the breeding season was the period of highest mortality. Even Scandinavian winters did not seem to trouble his birds. However, Saari & Mikusiński (1996) showed that population fluctuations of Lesser Spotted Woodpeckers in the Finnish Baltic correlated with January–February temperature, while in Norway Steen *et al.* (2006) showed that population fluctuations were related to both December and June temperature – both studies thus suggesting at least some impact of winter conditions on populations. Selås *et al.* (2008) re-examined the data from Norway and suggested that the mechanism linking population fluctuations and June temperature was the micro moth *Argyresthia goedartella*, whose numbers were high in years following summers with high June temperature.

Rossmanith *et al.* (2007) used the Swedish and German data to build population models of Lesser Spotted Woodpecker populations and were able to infer best estimates for juvenile survival in the population. They were also able to show that polyandrous pairings were highly advantageous for the females and, although the productivity of the nest with the secondary male was often low, such a strategy was beneficial for the population as a whole when there was an excess of males (Rossmanith *et al.* 2006).

Conservation implications

The Lesser Spotted Woodpecker is a specialist woodpecker that is declining substantially in Britain and appears to be doing so elsewhere in northern Europe and Scandinavia. In northern Europe and Scandinavia, the causes of the decline appear to be related to forestry operations and the loss of patches of broadleaved woodland within largely coniferous mixed forests. In Britain, the causes of the decline are less clear. The species did exceptionally well during the initial outbreak of Dutch elm disease in the late 1960s/1970s but there has been a sustained decline since then. However, factors other than the loss of elm trees now appear to be driving that decline. Loss of old, traditional orchards will have been a factor in some parts of the range. The fact that birds are now found mainly in

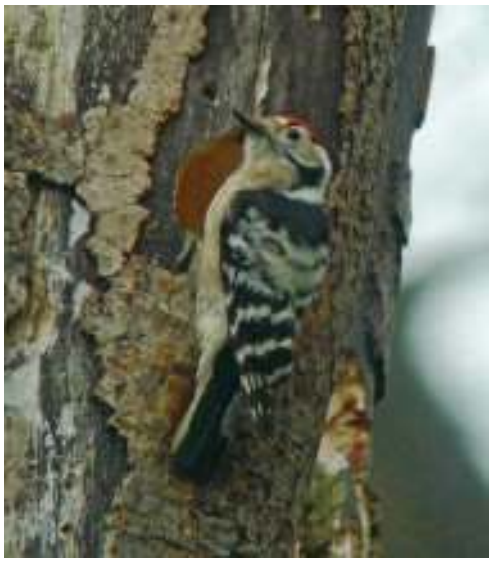
well-wooded areas (whereas the nest record information up to the late 1980s suggests that nests in farmland and gardens were once common) may be a clue. Does the loss of elms and other hedgerow trees mean that the landscape in some parts of Britain is now less suitable for Lesser Spotted Woodpeckers than it once was?

Thanks to three major studies, we now have a good knowledge of many aspects of the life history of the Lesser Spotted Woodpecker, which will at least allow further work to be focused on key areas of its ecology. The current low breeding success linked to chick starvation in Britain is a cause of particular concern. Without figures for annual survival rates from the UK we cannot be certain, but it would seem feasible that breeding success is now sufficiently low to be driving the observed population declines (Charman *et al.* 2012). Olsson's work showing the 'carryover effect' from the pre-breeding season suggests that in our efforts to identify the causes of the low breeding success we need to look in this period as well as the breeding period itself.

Lesser Spotted Woodpeckers nest comparatively late, with the peak of egg-laying about one week later than in the Great Spotted Woodpecker (Glue & Boswell 1994), so they are potentially vulnerable to a temporal mismatch between the caterpillar peak and their nesting cycle. In both Sweden and Germany there were clear trends for late-nesting birds to do less well. In Britain this issue could be exacerbated by our comparatively mild Atlantic conditions and the trend to warmer springs in recent decades. Since the Lesser Spotted Woodpecker is a resident species, we would expect it to be able to respond, but this may not be possible if food resources are limiting in the pre-breeding season.

There is a need for basic information on the ecology of the Lesser Spotted Woodpecker in Britain during the pre-breeding period. For instance, we have no idea whether the larvae of the micro moth *Argyresthia goedarthella* play such an important role in Britain as they do in Scandinavia. This moth is relatively common in Britain (Plant 2008), associated with birch and alder trees, but we have relatively few observations of Lesser Spotted Woodpeckers foraging on these two tree species in the pre-breeding period. In fact, most observations at this time are of birds foraging on small-diameter live branches on oak trees. Is there some vital element of the ecology that we are missing in Britain?

It is apparent that the loss of mature hedgerow elms and old orchards will have been detrimental to Lesser Spotted Woodpeckers, but have there been any changes to the composition and structure of broadleaved woodlands that could also have been detrimental? There have been consistent



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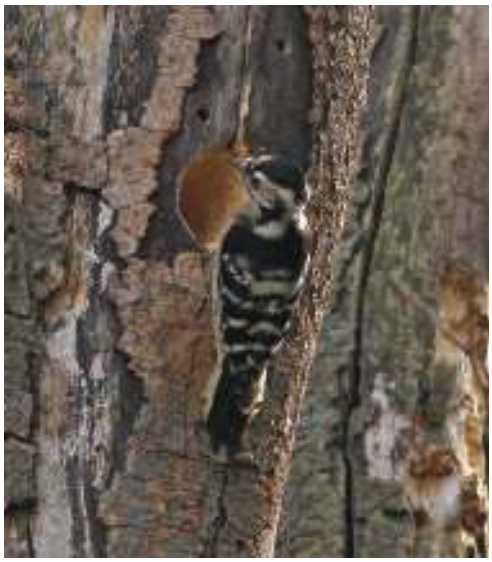

Alan Reynolds

175 & 176. Male and female Lesser Spotted Woodpecker at nest-site in Hertfordshire, April 2012.

Monitoring Lesser Spotted Woodpeckers

BOX 2

Numbers of Lesser Spotted Woodpeckers are now so low in Britain that it is important for all records throughout the year to be submitted by birdwatchers to their County Recorder or to BirdTrack (http://www.birdtrack.net). The best time to detect birds is in early spring (March–April), when they call and drum. After April, the adults go silent but nests can be located by the presence of chippings under a tree or the sound of noisy chicks. All records of breeding or suspected breeding should be submitted to the RBBP (http://www.rbbp.org.uk) and if you come across an active nest, details should also be submitted to the Nest Record Scheme of the BTO (http://www.bto.org/nrs). Even if you are unable to see the nest contents, details of the nesting tree (species, alive or dead) and timing of breeding will be valuable contributions. See box 1 for details of how to study the breeding success of hole-nesting species in natural nest-sites.

Once settled into incubation and feeding young, Lesser Spotted Woodpeckers can normally be viewed safely at the nest. However, they can be very fickle when prospecting and excavating a nest cavity so disturbance should be minimised at this time. If you find a nest at this stage, please bear in mind that there may be considerable demand from birdwatchers to view what is now a very rare species and you may need to facilitate safe viewing of the nest. The welfare of the birds should always come first.

changes in the vegetation structure and an overall increase in dead-wood availability in lowland broadleaved woodlands in the last two decades (Amar *et al.* 2010), often associated with the cessation of active management (Fuller *et al.* 2005), but it is difficult to see how these could have adversely affected Lesser Spotted Woodpeckers. In fact, the increase in dead wood would be expected to benefit them. In some areas birch has declined and matured as woodlands have become more closed (Amar *et al.* 2010; KWS pers. obs.) but this is not consistent across regions.

In the period when the Lesser Spotted Woodpecker has been declining in Britain, the Great Spotted has increased markedly and it is tempting to link these two trends. However, there is no evidence that the Great Spotted Woodpecker is directly linked to low breeding success of the Lesser Spotted. The main cause of nest failure in recent studies was chick starvation and no relationships were found between breeding success and the local abundance of the Great Spotted Woodpecker or the intensity of observed interactions between the two species at the Lesser Spotted Woodpecker nests (Charman *et al.* 2012a). However, we cannot rule out indirect effects such as increased overlap of dead-wood foraging niches or interference from Great Spotted Woodpeckers causing Lesser Spotted to abandon a part-excavated cavity leading to a delay in their nesting and reduced breeding success.

Although much has been learnt about the ecology of the Lesser Spotted Woodpecker over the last decade, we are still a long way from being able to identify measures that might bring about a reversal of the downward population trend. Much more work is needed to confirm that low breeding success is the driver of the decline and to identify the exact mechanisms involved. The Lesser Spotted Woodpecker is now such a rare and elusive species in Britain that it has become a difficult bird for most birdwatchers to see. However, by submitting their records and making sure they 'look after' their birds, birdwatchers make a big contribution to our knowledge base and, in due course, the development of conservation measures (see box 2).

Acknowledgments

Part of the work described in this paper was carried out by the RSPB and funded under the Action for Birds in England programme of Natural England. We thank Richard Gregory and Phil Grice for their help and support in this work. We also wish to thank the fieldworkers who accepted the challenge of working on this difficult species – Andrew Cristinacce, Ian Dillon, Steve Dodd and Derek Gruar. Nigel Butcher helped to develop and build the video nest-inspection cameras. Dawn Balmer and Simon Gillings of the BTO kindly allowed us to see the preliminary results of Bird Atlas 2007–11. We owe particular thanks to Ulf Wiktander, who carried out the pioneering work on Lesser Spotted Woodpeckers in Sweden and has provided helpful advice throughout our studies.

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