

A Review of Bird Ringing at the Knepp Estate 2015 - 2019



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Introduction

Apart from a few nestlings, ringing commenced at Knepp on 14th August 2015 and has continued to the end of the period under review. Due to other commitments of the ringer in charge, effort is concentrated in the autumn and winter periods. As with any new ringing site, especially a large one, it takes time to learn what the opportunities are and which areas are most productive.

In 2015 the primary ringing site was in the willow scrub around the scrape in Brookhouse 8. This resulted in catches dominated by tits and leaf warblers (especially Chiffchaff). In 2016 we switched to the more diverse scrub in 27 Acres and continued to use this site in 2017. Part way through the autumn of 2018 we started to use New Barn 2 in combination with 27 Acres, although the latter site remained our primary area during the winter months. During 2019 we continued to utilise New Barn 2 and 27 Acres during the autumn although with perhaps a greater emphasis on New Barn 2. 27 Acres remained the primary site during the winter months.

The weather has a significant impact upon ringing activities. Dry conditions and light winds are needed in order for the sessions to be safe for the birds and to be productive. Conditions during the autumns of 2016 and 2018 were excellent, with virtually no sessions lost. 2017 was very poor with unsettled weather throughout, leading to frequent lost sessions. There is a suggestion that prolonged unsettled weather in the late summer and autumn results in migratory species leaving the UK earlier and this did seem to be the case in 2017. In 2019 a couple of sessions were lost in August and the whole of October was very poor but the remainder of the period was good.

Methodology

The vast majority of birds were caught using mist nets operated from dawn to late morning in the autumn and from mid-afternoon to dark for roosts in the winter. Sound lures are used for selected species during the autumn and winter. These are only effective for some species and at Knepp they are mainly used for warblers, winter thrushes, finches and Swallows.

The number of nets used has increased during the period under review, as trainees have become more experienced and proficient enabling a greater number of birds to be processed safely. However there are rarely more than five 18m nets used in New Barn 2 and six in 27 Acres.

A small number of nestlings are ringed each year, mainly as a result of the British Trust for Ornithology (BTO) nest recording course. Unfortunately there has been insufficient time to enable more extensive nest recording to take place.

Results

Table One shows the annual ringing totals for each species at Knepp. The table excludes Barn Owls which are traditionally ringed by a ringer who is not part of the group. It is likely that the ringing of Barn Owls will transfer to our group in 2020.

A total of 61 species were ringed during the period.

Great caution should be exercised in drawing any conclusions about population changes from changes in the number of birds ringed. Apart from the different sites used in each year and the effects of weather on catching success or ringing activity, a number of other factors may have affected the number of birds ringed. Discussion of these factors can be found in the notes on selected species but in general, the most comparable years were 2018 and 2019.



Table One : Number of each species ringed per year during the period 2015 – 2019.

FG refers to fully grown birds, pulli are birds still in the nest or otherwise not yet capable of flight.

	2015	2015	2016	2016	2017	2017	2018	2018	2019	2019	TOTAL
	FG	Pulli	FG	Pulli	FG	Pulli	FG	Pulli	FG	Pulli	
Sparrowhawk					1		1		2		4
Kestrel									1		1
Lapwing		3		1							4
Woodcock			1				1				2
Stock Dove											0
Collared Dove				2				2			4
Turtle Dove								2			2
Cuckoo							4				4
Tawny Owl									1		1
Barn Owl											0
Kingfisher					2		2				4
Green Woodpecker			1		1				1		3
Great Spotted Woodpecker	1				1		2		1		5
Magpie			1								1
Jay					2		1		1		4
Jackdaw		3		1				5			9
Goldcrest	14		25		12		12		10		73
Blue Tit	91		74		84		169	9	140	36	603
Great Tit	24		50		24		62		43	6	209
Coal Tit	2										2
Skylark								2		2	4
Sand Martin			2				2				4
Swallow			35		28		36		1	4	104
House Martin			7								7
Long-tailed Tit	64		42		19		45		25		195
Chiffchaff	78	6	198	14	130		161	5	133	2	727
Willow Warbler	33		88		77	4	128		98		428
Blackcap	25		153		78		682		728		1,666
Garden Warbler	1		11		4		29	5	36	8	94
Lesser Whitethroat			29	5	10	5	70		73		192
Whitethroat	3		58	13	60	18	124	21	240	32	569
Dartford Warbler							1				1
Grasshopper Warbler			1				1		2		4
Sedge Warbler	1		1		7		8		4		21
Reed Warbler	2		17	4	10	7	24		20		84
Nuthatch							2				2
Treecreeper	1		2		1				5	5	14
Wren	2		31		16		29		26		104
Starling							1				1
Blackbird		11	30	4	15	7	15	9	32		123
Fieldfare					9		4		3		16
Song Thrush		4	18	5	6	8	13		18	4	76
Redwing	1		78		74		77		52		282
Mistle Thrush		1									1
Robin	5		27	9	16		29	4	32	12	134
Nightingale	2	4	4				5		13		28
Redstart			1								1

Stonechat					1		1			2
Dunnock	5		17		12	4	41	4	55	138
House Sparrow					2					2
Grey Wagtail								4		8
Pied/White Wagtail							12			12
Tree Pipit			1							1
Meadow Pipit							6			6
Chaffinch			1	3	1	4	4		13	26
Greenfinch					1		2			3
Goldfinch			19		17		5		9	54
Linnet			8				14		41	74
Lesser Redpoll	1		26		4		12			43
Bullfinch			11		9		13		8	43
Yellowhammer							2		2	4
Reed Bunting				4						4
Annual Totals	356	32	1,068	65	734	57	1,852	72	1,869	6,237

Notes on Selected Species

Sparrowhawk

Generally caught when they are hunting birds coming in to the winter thrush roost. Many escape from the nets before they can be extracted for ringing.

Lapwing

All ringed as chicks when they bred in Brookhouse 3, Tench Ford and the river restoration area. They do not appear to have bred in the last three years, probably due to a combination of habitat change and regional decline. In Sussex as a whole there was a 46% net loss of tetrads (2km x 2km squares) between the breeding surveys in 1988-92 and 2008-11 (Thomas, 2014) and there is no reason to suspect that this decline is not continuing.

Woodcock

Single birds ringed at a Redwing roost in Waterworks West and by lamping in Brookhouse 3. Remarkably, the latter bird was shot north-west of Moscow (see Recoveries section).

Turtle Dove

Considerable efforts have been made to catch adult birds for tagging in order to determine their preferred feeding areas and foodplants at Knepp. None of the techniques tried so far have been successful. The two birds ringed were nestlings in a nest found accidentally in 27 Acres. Any observations of Turtle Doves feeding at Knepp would be gratefully received by the estate Ecologist.

Cuckoo

Three of the four Cuckoos ringed in 2018 were tagged as part of the BTO's tracking project (see https://www.bto.org/our-science/projects/cuckoo-tracking-project?gclid=EAIaIQobChMI96-By5LE5wIVRrTtCh3wZQK2EAAYASAAEgLUMfD_BwE).

'Knepp' successfully completed one full migration, wintering in Angola – as far south as British Cuckoos are known to go – before returning to



Lee Barber of BTO with one of the satellite tagged Cuckoos

Knepp on 25th April. Conditions in summer 2019 were clearly very challenging for British Cuckoos migrating south and Knepp appears to have perished in northern Spain in mid-July.

‘Raymond’ also completed one full migration, wintering in the Congo approximately 750km north of ‘Knepp’. Despite having a head start, Raymond’s migration north was late and slow and he did not return to Knepp until 22nd May, almost a full month later than ‘Knepp’. After having spent less than a month in the UK, Raymond departed on 20th June. Raymond’s southward migration was more successful than ‘Knepp’s’ but it seems that the same conditions prevented him from putting on sufficient fat to cross the Sahara and he is thought to have died in the southern Mauritanian desert in early August.

The final Cuckoo ‘Lambert’ followed a similar pattern to ‘Knepp’, successfully migrating south to Angola and returning to Knepp on 8th May. He left on the evening of 17th June and made it as far south as Montpellier in southern France but he also succumbed to the tough conditions in southern Europe in 2019 and died in mid-late August.

It is suspected that Knepp Cuckoos primarily parasitise Dunnocks but this has not yet been demonstrated.

Goldcrest

A scarce breeding bird at Knepp, being largely confined to plantation areas during the breeding season. Almost all birds are ringed in late autumn / winter when they disperse into deciduous scrub and woodland. They are probably migrants from further north or from the continent although this has yet to be proven from ringing recoveries at this site.

Blue Tit and Great Tit

The largest numbers are caught in mixed roving flocks. These seem to have a preference for the taller willow scrub and proportionally, a much higher number were caught in 2015 in Brookhouse 8 than in subsequent years. Nestlings are generally not targeted but the total in 2019 includes 36 ringed in boxes in the northern block. Two Knepp ringed Blue Tits have been found dead in Dial Post (see recoveries section).

Coal Tit

A scarce species at Knepp, being primarily a species of coniferous woodland. Two were caught in with mixed flocks in Brookhouse 8.

Skylark

Not a common species at Knepp. All those ringed so far have been nestlings. Brood sizes in both cases were rather small, which may be indicative of Knepp being suboptimal habitat for this species but it is rather too small a sample size to draw any firm conclusions.

Swallow

Although they breed in some of the buildings around the estate, all the birds ringed have probably been migrants moving through in autumn, as illustrated by the Lancashire ringed bird which was retrapped at Knepp. Numbers often used to congregate on wires near the Hammer Pond but it is not clear whether these birds are spending a prolonged period at Knepp or just moving through.

This congregation on the wires near the Hammer Pond was not evident in 2018/19, probably as a result of poor numbers in the UK in those years. In 2018 a roost was found in an unusual habitat; willow scrub in the scrape in Brookhouse 8. This roost contained in excess of 100 birds but only one catch was made. The area of the scrape in which the scrub is located dried out during the summer of 2019 so no roost was present.



Skylark nestling

House Martin

Although they breed on the castle, those in the southern block tend to be birds passing through in mixed hirundine flocks. They often pause for a few minutes to feed over the Hammer Pond but quickly move on.

Long-tailed Tit

A common species at Knepp and one that is quite easy to catch. It seems to have a preference for the taller willow scrub over the mixed thorn scrub fields. The significant drop in numbers ringed in 2019 is not easy to explain as nationally, both adult abundance and productivity were 20-25% above the five-year mean (BTO, 2020).

Chiffchaff

A common summer visitor, breeding species and passage migrant at Knepp, with occasional birds overwintering. The bulk of the birds are ringed in the latter part of the autumn (particularly September and October). It is not clear at this stage what proportion of the birds ringed are locally breeding birds and how many have come from further afield. All the recoveries involving Knepp birds have been of those ringed at Knepp and re-caught elsewhere. The general impression is that birds caught during July and August are predominantly local birds and that the number of passage birds increases in the latter part of the autumn. One bird ringed in May 2015 as a nestling in Brookhouse E was retrapped in Brookhouse 13 on 29/05/2016.



Chiffchaff (Photo : S.G. Davis)

Recoveries show a clear easterly movement of birds when they leave Knepp, with same-autumn movements to Sandwich Bay and St Margaret's at Cliffe in Kent and to Willingdon in East Sussex.

Chiffchaff numbers in southern England were very low in 2018 and recovered significantly in 2019. Productivity was also very high in 2019 (30% higher than the five-year mean (BTO, 2020)). The reason for the comparatively low numbers ringed in 2019 is the lack of ringing effort during peak migration in October due to poor weather at weekends.

Willow Warbler

This species is a rare breeder at Knepp and almost all of the birds ringed will be passage migrants, probably from further north. One bird ringed in Cambridgeshire was retrapped at Knepp two years later. However the date of capture in Cambridgeshire means that the bird may already have been moving south when it was initially caught. Another individual, ringed at Knepp in mid-August, was retrapped 535km to the south in Charente-Maritime, France 12 days later.

With 428 birds ringed, it is of note that only one has been retrapped. This bird was ringed on 31st July 2016 in 27 Acres and recaptured five days later in Brookhouse 8. It is surprising that not a single one has been retrapped within the same field in which it was ringed. It is suspected that this indicates that their stay at Knepp is quite short as even if there were huge numbers moving through the site, it would still be expected that a small number would be retrapped if they were still in the same area.

Figure 1 shows a single peak in the phenology of Willow Warbler captures at Knepp as would be expected of a species where all captures are likely to be of passage birds moving through the site (cf. species with strong breeding populations at Knepp such as Whitethroat and Lesser Whitethroat). See however the cautionary note below Figure 1.

The decline in numbers ringed between 2018 and 2019 is largely due to the loss of several ringing sessions during their peak passage as a result of poor weather.

Blackcap

A common breeding species at Knepp. The Sussex population in 2008-11 was estimated at 36,000 territories (Thomas, 2014). The birds ringed at Knepp will undoubtedly be a mixture of 'home-bred' and passage birds. The most clear-cut example of the latter is a bird ringed at Knepp in September 2018 and retrapped on the East Yorkshire coast in April 2019, presumably either at, or en route to, its breeding grounds.

Of the five within-year movements to or from Knepp, two were moving south as expected in the autumn but three had moved north; from Beachy Head to Knepp and from Knepp to Suffolk and Northamptonshire. It is difficult to explain these movements. Whilst some Blackcaps from continental Europe do now overwinter in Britain and could conceivably be moving north through southern England in the autumn, they must surely be greatly outnumbered by British-bred birds moving south. This in turn raises the question of why, with such large numbers ringed at Knepp, no birds have been reported from sites to the south or south-east during the same autumn. Do Knepp birds all leave Britain via a route where no ringers operate (a theory which seems most unlikely), or do those on a southerly migration find feeding conditions at Knepp so favourable that they leave our shores direct from Knepp? One would need a number of recoveries from France or Iberia within a short period of their last capture at Knepp to provide evidence for this.

Given that 1,666 Blackcaps have been ringed at Knepp, almost all in the autumn, and there have been only 20 recaptures, there must either be a remarkable number of birds moving through the site or the birds must move through quickly. The number of days between first and last capture for these birds was:

1 – 10 days : 11
11 – 20 days : 4
21 – 30 days : 2
31 – 40 days : 1
41 – 50 days : 2

So some birds remain in the area for a considerable period of time whilst the majority are not seen beyond 10 days after first capture.

Obviously those birds which stay for the longest periods must initially be caught early in the autumn whereas the higher numbers of birds are not caught until late August (see Figure 1). It could be that individuals born at Knepp remain on site for much longer than those moving through from elsewhere but this is just supposition at the present time. Adult birds which bred at Knepp are highly likely to remain on site whilst they undertake their moult.



Aberrant first-year male Blackcap with white feathers in coverts and alula

Figure 1 provides some insight into the origins of Blackcaps ringed at Knepp, particularly when compared with other migratory species. Autumn ringing at Knepp begins in mid to late July and the 'background' level of Blackcaps caught between then and mid-August could be considered to represent local birds. There is no plausible reason why catch rates would increase rapidly at the end of August if they were primarily local birds so the only reasonable conclusion is that the great majority of birds using Knepp in the autumn are on passage. Given that Knepp is not located on any geographic or topographic feature that would concentrate migratory birds, it seems reasonable to conclude that the extremely high numbers of Blackcaps found there in the autumn are the result of attraction to the habitat and the food resources that it supplies. See however the cautionary note below Figure 1.

The large increase in numbers ringed in 2018/19 was initially thought to be predominantly due to the switch to ringing in New Barn 2, however the numbers ringed in 27 Acres in 2019 are considerably higher than the totals in 2016/17 so there would appear to have been an increase in the number of birds using the whole site. Nationally, adult Blackcap numbers in 2019 were over 40% above the five-year average but breeding productivity was slightly below the five-year average (BTO, 2020).

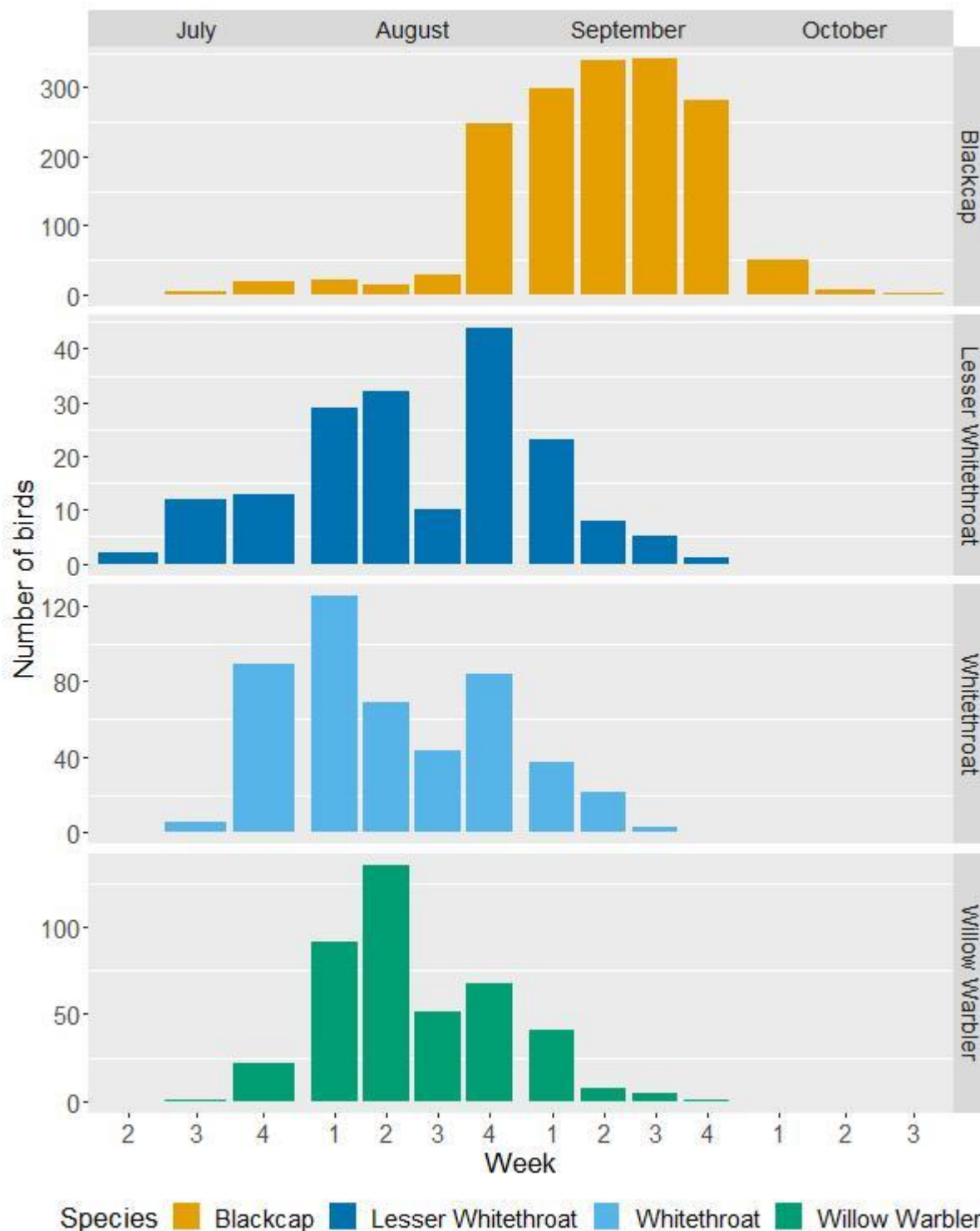


Figure 1 : The number of selected migrant species caught per week during the autumn period at Knepp 2015-19.

Cautionary note : During the preparation of Figure 1 it became apparent that small changes to the way in which the data was prepared could cause significant changes in the resulting graphs. This is due to the fact that whilst the sample sizes of birds caught are reasonable, the number of days on which trapping took place in any given period was small so if a single trapping session was moved into an adjacent week, the effect on the appearance of the graph was large. The number of trapping sessions in the third week of August is lower than in other weeks.

Garden Warbler

A moderately common species in Britain but with an estimated population less than 10% of that of Blackcap and with more restricted habitat requirements. During the 2008-11 breeding atlas survey period, it was recorded in 56% of tetrads in Sussex (cf. 94% for Blackcap), with confirmed or probable breeding in 19% (cf. 66% for Blackcap) and an estimated population across the two counties of 4,400 pairs (Thomas, 2014). The mixed thorn scrub fields at Knepp

are particularly suitable and it is likely that Knepp supports a locally significant population although it is not the easiest species to survey.

Birds ringed at Knepp are probably a mix of locally bred birds and passage birds moving through the area but with the majority likely to be local birds. The number of birds ringed at Knepp in 2018 was more than a third of the total ringed in West Sussex in that year. The one ringing recovery is interesting in that it involves an adult bird ringed at Queen Mary Reservoir in 2018 but which appears to have changed its breeding site to Knepp in 2019. It was breeding in Brookhouse 13 in May and was also re-trapped in New Barn 2 in early August, demonstrating wide ranging movement around the southern block after the end of the breeding season.

The substantial increase in numbers ringed during 2018/19 appears to be strongly related to the move to ringing in New Barn 2 as there has not been a corresponding increase in numbers caught in 27 Acres, at least in 2019. However the increase in numbers between 2018 and 2019 should be seen against a national backdrop of a substantial 30% decline in productivity in 2019 against the five-year average (BTO, 2020) so Knepp seems to be bucking the national trend in 2019.

Lesser Whitethroat

This species goes somewhat under the radar at Knepp, at least in comparison with high profile species such as Nightingale and Turtle Dove, but it is surely one of the ornithological highlights of the site. Of the warblers that breed at Knepp, this is the one with the lowest national population. In Sussex it was recorded from 41% of tetrads during the 2008-11 breeding atlas survey period, with confirmed or probable breeding in 13% of tetrads. The Sussex breeding population is estimated at 1,800 pairs (Thomas, 2014). The number of birds ringed at Knepp in 2018 represents 83% of the West Sussex ringing total for that year and nearly 3% of the national total. Of the total ringed in 2018/19, 74% were ringed in New Barn 2 and 23% in 27 Acres. How much the birds move around the southern block, and therefore what proportion of the birds present that we actually catch is a matter of complete conjecture. We have only had five recaptures of ringed birds, three were within a week, one after almost a month and one was of a bird ringed in autumn 2018 and recaptured in spring 2019. All recaptures were in the same field as the original ringing. There have been no recoveries of birds involving other sites.



Just fledged Lesser Whitethroat. Note gape and partially grown tail.

The phenology of initial capture of birds shows a different pattern to that of Willow Warbler and Blackcap (Figure 1) in that it shows a double peak. The first peak is likely to be composed primarily of locally bred / breeding birds, these start to leave the site and then the second peak is dominated by passage birds moving through the area. Interestingly the timing of the second peak in late August coincides with when the highest numbers are recorded at coastal sites in Sussex (Thomas, 2014).

Whitethroat

An abundant breeding species at Knepp. The Sussex population in 2008-11 was estimated at 30,000 territories (Thomas, 2014). This species used to be the commonest warbler in Britain but it never completely recovered from a population crash in 1969 caused by drought in the Sahel and is now the 4th commonest, behind Willow Warbler, Chiffchaff and Blackcap. The abundance now at Knepp may resemble that of the pre-crash days in suitable habitats. In 2018 the numbers ringed at Knepp represented 62% of the West Sussex total. Even taking into account the changes in ringing sites, there appears to be an increasing trend in the numbers caught year on year. The increase of 87% between 2018 and 2019 is particularly noteworthy, given the similarity in activity and set against national changes of a 16% increase in adult abundance but a 10% decline in productivity, compared to the five-year average (BTO, 2020).

Only two recoveries away from Knepp have been received, both relating to young birds ringed at Knepp in autumn 2018 and then found dead, having hit domestic glass, the following spring at Storrington and West Grinstead. The method of death is surprising for a species that is not typically a garden bird but it is interesting that both were found away from Knepp but at locations within 10km. This could suggest that Knepp is producing a surplus of young birds which are spreading out into the surrounding areas. A number of ringed birds were seen breeding at Knepp in 2019 but there was no time to retrap them and it is therefore unknown whether they were originally ringed as nestlings or as fully grown birds during the autumn.

Sixteen birds have been retrapped at Knepp, of which 14 were within-year retraps. Despite the small numbers, they reveal some interesting points. The pattern of time elapsed between first and last capture is similar to that for Blackcap.

1 – 10 days : 8

11 – 20 days : 2

21 – 30 days : 3

31 – 40 days : 1

So the majority are only retrapped within a fairly short period after first capture but some birds certainly remain for a long period.

The majority of fully-grown birds were retrapped in the same field in which they were first caught but one bird moved from New Barn 2 to 27 Acres in six days – the only bird of any species known to have moved between these fields. If a high proportion of the migrant species are ranging widely within the southern block at Knepp, this would explain the very low recapture rate. Interestingly, the proportion of birds recaptured in 27 Acres is 6% ($n = 164$) whilst that in New Barn 2 is just 1.1% ($n = 260$). Does this difference mean that 27 Acres provides more suitable habitat that retains birds better? Alternatively, it could be that conditions in New Barn 2 enable the birds to feed up and move on more quickly.



Whitethroat (Photo: S.G. Davis)

One nestling ringed at the Hammer Pond on 11th June was retrapped at New Barn 2 on 3rd August. Another, ringed in 2018 at New Barn 2 was retrapped on 24th July 2019 at Honeypools Barn.

The phenology of initial capture shows a similar pattern to that of Lesser Whitethroat (Figure 1), with an initial peak presumably made up of local birds and then a smaller peak in the latter part of August when passage birds are moving through.

Dartford Warbler

Knepp is not typical of the habitat that Dartford Warblers have used in Britain until recently. However, on the continent they utilise a wider range of scrub and there has been some evidence of an expansion of their habitat tolerances in Britain in recent years as a series of mild winters have resulted in an increasing population. The one individual ringed at Knepp was a wintering individual but any prospect of colonisation of Knepp by this species was eliminated a couple of months later by the ‘beast from the east’ which caused significant mortality in Dartford Warblers. It is likely to be several years before the population recovers enough to make the colonisation of Knepp a possibility.

Grasshopper Warbler

A much declined species which is now very rare as a breeding bird in southern England. It is a species which is very rarely recorded when it is not singing and the small numbers ringed during autumn passage probably mean that this species is a regular migrant through Knepp, albeit not a common one.



First-year Grasshopper Warbler

Reed Warbler

Breeds around the Mill Pond, with small numbers at the Hammer Pond and elsewhere but it is likely that most if not all of the ringed birds were on passage from elsewhere. As reed beds are popular ringing sites, the relatively small number caught at Knepp have produced three recoveries, with birds from Surrey and to Kent but the highlight was a bird ringed in early August and retrapped 16 days later in Navarra, Spain, 920km to the south.

Treecreeper

The significant increase in numbers in 2019 is somewhat misleading as half were ringed as nestlings at the camp site. However there is perhaps an indication though that some of the scrub is now reaching an age and size that makes it more suitable for this species. It will be interesting to see if this trend continues.

Blackbird

Resident birds are joined by those from the continent during the winter, as illustrated by a male ringed in mid-December which was retrapped in March at Landguard on the Suffolk coast, presumably on its way back to its breeding grounds.

Fieldfare

Very small numbers are caught at roost in 27 Acres. A first-year male bearing a Belgian ring was caught on 9th November 2019. Ringing details have yet to be received from the Belgian ringing scheme at the time of writing but it will have been ringed during its autumn migration. The correlation with the Belgian ringed Redwing is interesting.

Song Thrush

As with Blackbirds, resident birds are joined by others from northern Europe during the winter. No ringing recoveries have yet been received to confirm this at Knepp but northern birds are larger and two birds caught together in mid-December 2016 illustrate this. One had a wing length of 118mm and a weight of 69g, the other had a wing length of 123mm and a weight of 104g.

Redwing

Knepp supports large numbers of this winter visitor and small numbers are regularly caught entering or leaving the roost in 27 Acres. The majority of the birds at Knepp are of the nominate race *iliacus* which breeds from Scotland (in very small numbers) eastwards but a few show characteristics of the race *coburni* which breeds in Iceland and the Faroes. None have been retrapped and this is probably a reflection of the small numbers ringed in relation to the numbers present. However it means that there is no evidence one way or the other as to whether individuals remain at Knepp all winter or move further south or west during the winter. One individual, ringed on 12th November 2016 in West-Vlaanderen, Belgium, presumably whilst on passage, was retrapped at Knepp in February 2017.

Robin

Resident birds are probably joined by migrants from the continent during the winter but as yet there are no recoveries to support this at Knepp.

Nightingale

One of the icons of the rewilding project at Knepp. There are few if any other sites in the country where the population is increasing but Knepp demonstrates that, whatever the causes of the national decline, there is still the potential to increase numbers if suitable habitat is provided.



Treecreeper nest in the bath house at the camp site

Limited time availability, particularly during the breeding season, has restricted investigations and the fundamentals of the population remain unknown. However a few observations give pointers to areas of further study when time allows. Foremost amongst these is the need to determine the source of birds that are driving the population increase at Knepp. Are they Knepp-bred birds, which would imply that the driver of the UK population decline is a lack of optimal habitat in the breeding season, or is the habitat at Knepp drawing in birds from elsewhere? The answer to this question has implications well beyond the boundaries of Knepp.

Stonechat

Overwinters in small numbers. The habitat is suitable for them to become a breeding species in the southern block but there is no sign of this happening to date. The cold winter of 2017/18 caused significant mortality and numbers in southern England are noticeably lower than they were prior to that winter so it may take a while before the population recovers sufficiently for them to colonise new sites.

Dunnock

The significantly increased numbers in 2018/19 were initially thought to be due to the increased ringing activity in New Barn 2, however there was a 73% increase in numbers caught in 27 Acres between 2018 and 2019 and Figures 2 and 3 suggest that 27 Acres actually provides better habitat for this species than New Barn 2. The increase in numbers in 2019 is against a national 20% decrease in adult numbers but a 40% increase in productivity versus the five year average. There is therefore a suggestion that Knepp did better than the national trend during 2019.

It is likely that Dunnock is the primary host of Cuckoos at Knepp and a thriving population is therefore of conservation importance.

Meadow Pipit

Small numbers overwinter at Knepp but all birds were ringed during autumn passage. Numbers moving in autumn are much lower than those experienced at the coast and on the Downs.

Chaffinch

A surprisingly scarce bird at Knepp but even so, caught in smaller numbers than would be expected. The majority of birds ringed in 2016-18 were nestlings. It is not clear whether the increase in numbers caught in 2019 is anything more than a coincidence.

Linnet

This species is something of an enigma at Knepp. It was a fairly common breeding species in 2019 although it is not clear whether numbers are increasing. It was ringed in very low numbers until 2019 but the significance of the increase in this year is also unknown. Linnets seem to be generally absent from Knepp during the winter although a small roost was found in 27 Acres in winter 2018/19. As no birds are seen during the day in winter it seems likely that these birds are feeding off site and just using Knepp as a roost site.

As a Red Listed species (BOCC4) it would be useful to carry out more detailed investigations at Knepp.

Lesser Redpoll

Only recorded at Knepp during autumn migration, virtually none are seen during the winter as their preferred food, birch, is rare on the site. No autumn passage took place in 2019 and the species was rare in southern England as a whole in the subsequent winter. One bird ringed at Knepp in mid-October 2018 was retrapped at Sandwich Bay on the east Kent coast 27 days later.



First winter male Stonechat

Yellowhammer

This is another Red Listed species for which further study at Knepp would be valuable. Only very small numbers have been ringed so far although birds have been noted nesting in large bramble patches which are not typical nest sites.

Comparison between fields

One interesting area for investigation at Knepp is to look at the use by birds of fields with different scrub types. The most scientifically robust way to do this would be to run simultaneous ringing sessions in different fields, without the use of sound lures to influence capture rates. This has not been done and it is unlikely to be possible, at least in the short term. However, sufficient ringing has taken place in 27 Acres and New Barn 2 during 2018/19 for at least a superficial comparison to be made.



Yellowhammers

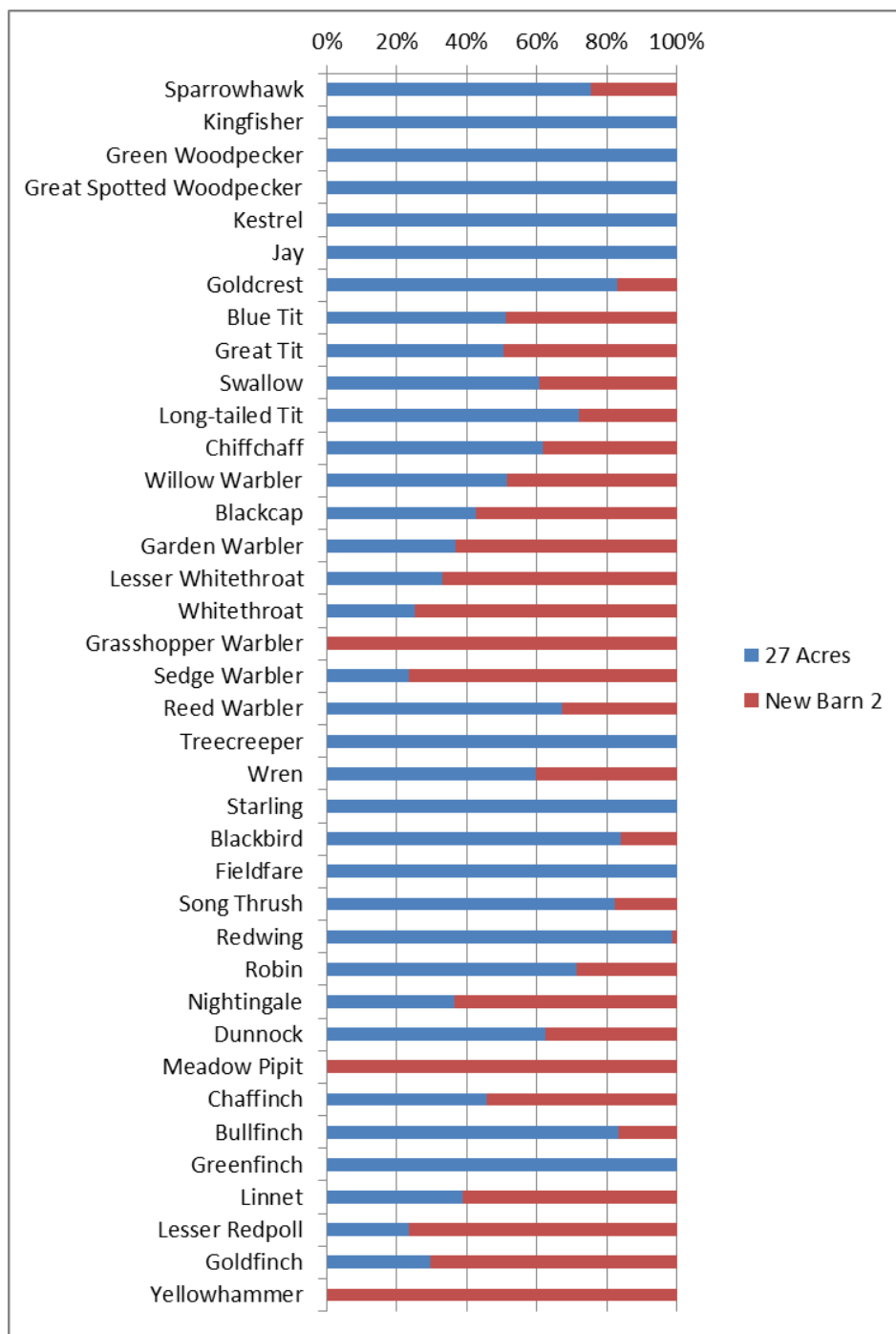


Figure 2 : Effort corrected proportion of each species ringed in 27 Acres and New Barn 2 during 2018/19.

In general terms, 27 Acres is at a more advanced state of scrub colonisation than New Barn 2. The scrub is denser, with relatively small open glades and ‘rides’ maintained by the grazing animals. It also contains a higher proportion of tall willows. New Barn 2 still has a predominantly open feel to it, with scattered thorn scrub covering much of the field and only localised areas of dense scrub. Willows are very localised and are smaller than those in 27 Acres.

During 2018/19 a total of 1365 birds have been ringed in 27 Acres and 2101 in New Barn 2. The difference is largely related to greater ringing effort in New Barn 2 during the autumn period when peak numbers are caught. This creates a problem in making comparisons between the numbers of particular species in each field but if the numbers in New Barn 2 are proportionately reduced so that the total number of birds in each field is equivalent, a direct comparison can be made between the relative abundance of each species in the two fields. This is shown in Figure 2.

It is apparent from Figure 2 that 27 Acres supports a greater diversity of species. In almost all cases where 100% of the captures were made in 27 Acres, the numbers involved are very small and it could just be coincidence that the captures were made in that field and not in New Barn 2, however the overall impression of greater diversity is probably real and the list of species unique to 27 Acres includes woodland species such as Great Spotted Woodpecker and Treecreeper which really need more mature scrub than that available in New Barn 2.

Aside from those species which were only caught in 27 Acres, a number of species show a clear preference for this field. Foremost amongst these are the thrushes. This could be considered an artefact of ringing effort as winter thrushes are targeted at roost during the winter in 27 Acres but not in New Barn 2. However the taller willow scrub in 27 Acres provides a safer roosting environment and no equivalent roost is thought to exist in New Barn 2. Other species whose apparent preference for 27 Acres is influenced by winter roost ringing are Sparrowhawk, which are attracted to hunt the birds coming in to roost, and Wren which is most frequently caught at dusk when they appear to move around higher up in the scrub than they do during the day when they often fly underneath the nets.

Reed Warblers are typically found in wetlands although they do feed in scrub during migration. The apparent preference of this species for 27 Acres may be due to birds being attracted to the adjacent Hammer Pond and then dispersing into nearby scrub. Interestingly, Sedge Warblers do not show the same preference although the numbers involved are small.

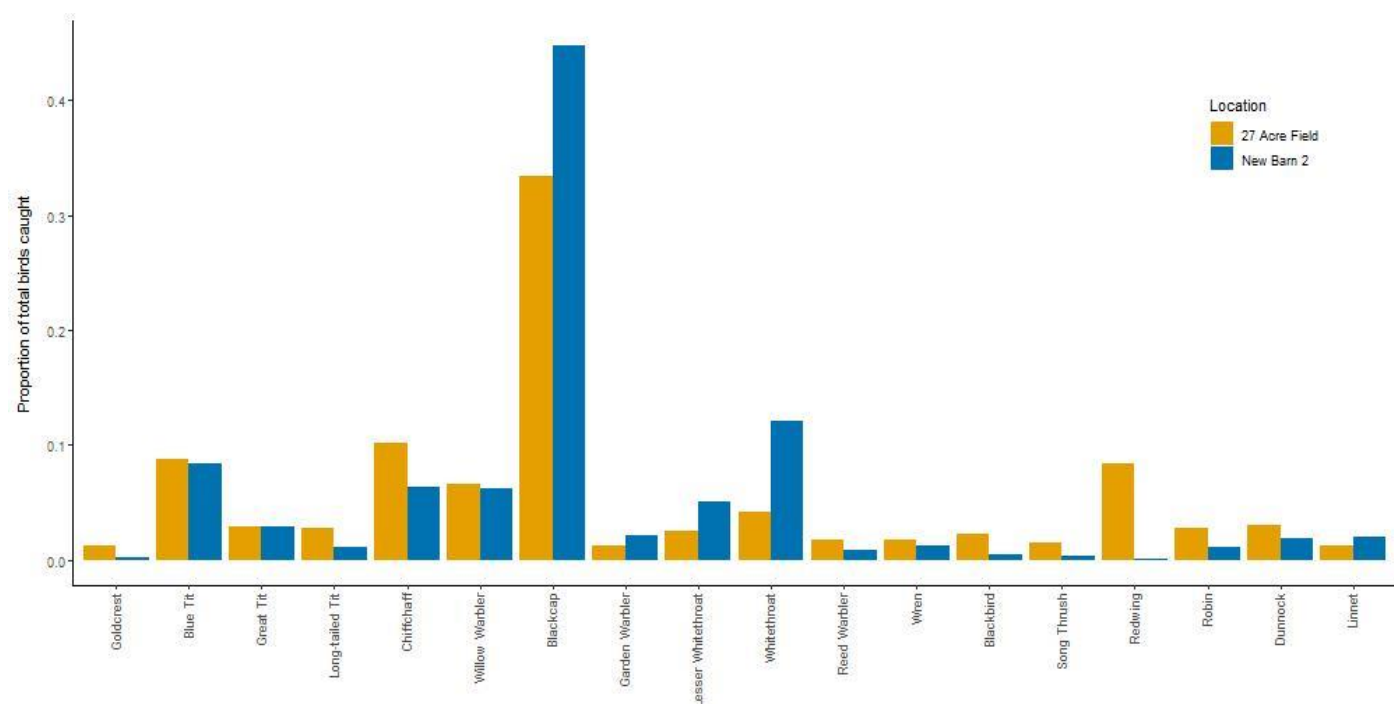


Figure 3 : Proportion of all birds caught in the respective field for selected species in 27 Acres and New Barn 2 in 2018/19

Other species which show a preference for the more mature scrub in 27 Acres include Goldcrest, Long-tailed Tit, Chiffchaff (but interestingly not Willow Warbler), Robin, Dunnock and Bullfinch. Of these, the first three are

probably attracted by the height of the scrub and the latter three more by the density.

Of the species showing a preference for New Barn 2, the most obvious are the ‘scrub warblers’ Blackcap, Garden Warbler, Whitethroat and Lesser Whitethroat. These species require berries for pre-migratory fattening so are clearly attracted to areas of thorn scrub. Nightingale is well known to be a scrub species but the numbers involved here are small and the apparent preference for New Barn 2 may have more to do with its proximity to a concentration of breeding sites and the subsequent post-breeding dispersal of birds from these sites than to any particular attraction to the type of scrub in this field. The remaining species showing a preference for New Barn 2, Meadow Pipit, Linnet, Goldfinch and Yellowhammer are species which feed on open ground so their attraction to this field is related to the greater proportion of grassland and herbaceous vegetation. Lesser Redpoll can be ignored as these are attracted by sound lure whilst moving through the site.

An alternative way to look at the preferences of particular species for each of the fields is to compare the proportion of all birds caught in that field which a species made up. The principle being that if a field is more suitable for a species, it will form a higher proportion of the total catch. This method is independent of the total number of birds caught and therefore is not adversely affected by the higher overall numbers caught in New Barn 2. Figure 3 shows the results for those species with more than 20 individuals ringed. The results are reassuringly similar to those shown in Figure 2, suggesting that making a correction for effort did not introduce significant bias into the results.

Recoveries

Figure 4 shows the spread of locations where Knepp ringed birds have been found or where birds that were recaptured at Knepp were originally ringed. It must be emphasised that the lines do not necessarily represent the movement that the bird made, especially where the original ringing and the subsequent recovery are in different years. It is of note that there is very little movement to or from the western side of the British Isles. Also of interest is the fact that the Willow Warbler retrapped in France and the Reed Warbler retrapped in Spain had moved along an identical trajectory, the line for the latter being deflected in the middle in Figure 4 so that both movements can be seen.

Full details of all recoveries received so far are given below.

Woodcock

ES14478. Ringed 07/01/2018 as an adult at Knepp. Shot on 15/04/2019 at Masyugino, Klinskiy district, Moscow, **Russian Federation**. 463 days, 2502 km.

Blue Tit

S093263. Ringed 03/09/2016 as a first-year bird at Knepp. Found long-dead, trapped in an outbuilding with another (unringed) Blue Tit on 08/04/2018 at Dial Post, West Sussex. 582 days, 3km.

ARB8897. Ringed 26/08/2018 as a first-year bird at Knepp. Found freshly dead, having hit a window on 27/08/2018 at Dial Post, West Sussex. 1 day, 2km.

Swallow

S094999. Ringed 19/08/2016 as a first-year bird at Fleetwood tip, Lancashire. Retrapped at Knepp on 06/09/2016. 18 days, 372km.

Chiffchaff

ETV467. Ringed 17/07/2016 as a first-year bird at Knepp. Retrapped by a ringer on 02/09/2016 at St Margaret's at Cliffe, Kent. 47 days, 124km.



Woodcock

KRJ309. Ringed 22/09/2018 as a first-year bird at Knepp. Retrapped by a ringer on 08/10/2018 at Sandwich Bay, Kent. 16 days, 127km.

KRJ367. Ringed 07/10/2018 as a first-year bird at Knepp. Retrapped by a ringer on 09/10/2018 at Chalk Farm, Willingdon, East Sussex. 2 days, 48km.

Willow Warbler

DHD380. Ringed 14/08/2013 as a first-year bird at Little Downham, nr Ely, Cambridgeshire. Retrapped at Knepp on 30/08/2015. 746 days, 171km.

JKK967. Ringed 11/08/2018 as a first-year bird at Knepp. Retrapped by ringer on 23/08/2018 at Marais de Pampin, La Rochelle, Charente-Maritime, **France**. 12 days, 535km.

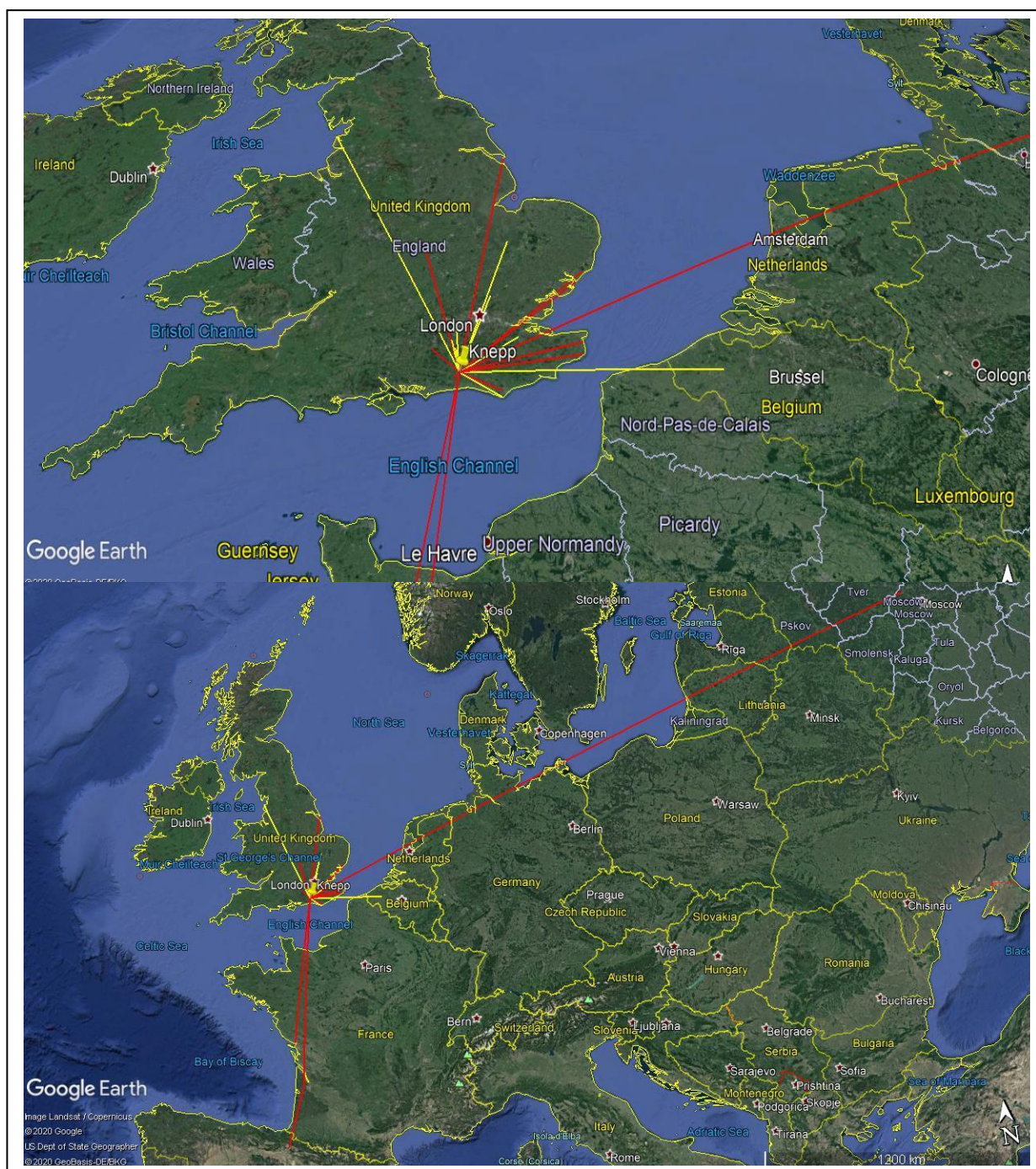


Figure 4 : Locations of birds ringed at Knepp and recovered elsewhere (red lines) and birds ringed elsewhere and recaptured at Knepp (yellow lines).

Blackcap

AHA5776. Ringed 16/09/2017 as a first-year male at Beachy Head, East Sussex. Retrapped at Knepp on 23/09/2017. 7 days, 52km.

AND0643. Ringed 05/09/2018 as a first-year male at Gomshall, Surrey. Retrapped at Knepp on 16/09/2018. 11 days, 27km.

APE1535. Ringed 15/09/2018 as a first-year male at Knepp. Retrapped by ringer on 18/04/2019 at Kilnsea, East Yorkshire. 215 days, 297km.

ATC0034. Ringed 12/08/2019 as a first-year female at Rye Meads, Essex. Retrapped at Knepp on 14/09/2019. 33 days, 91km.

AFJ8392. Ringed 24/08/2019 as a first-year male at Knepp. Retrapped by ringer on 09/09/2019 at Hollesley Heath, Suffolk. 16 days, 174km.

AZE2900. Ringed 30/08/2019 as a first-year male at Knepp. Retrapped by ringer on 30/09/2019 at Stanford Reservoir, Northamptonshire. 31 days, 169km.

Garden Warbler

AVD2266. Ringed 21/07/2018 as an adult at Queen Mary Reservoir, Surrey. Retrapped at Knepp on 18/05/2019 and again on 03/08/2019. 301 and 378 days, 51km.

Whitethroat

ARB8646. Ringed 11/08/2018 as a first-year bird at Knepp. Found freshly dead, having hit a window on 18/05/2019 at Storrington, West Sussex. 280 days, 8km.

APE1079. Ringed 01/09/2018 as a first-year bird at Knepp. Found freshly dead, having hit a glass conservatory on 30/04/2019 at West Grinstead, West Sussex. 241 days, 3km.

Reed Warbler

S093984. Ringed 05/08/2017 as a first-year bird at Knepp. Retrapped by a ringer on 21/08/2017 at Noain, Navarra, **Spain**. 16 days, 920km.

Z821319. Ringed 19/08/2017 as a first-year bird at Snodland, Kent. Retrapped at Knepp on 02/09/2017. 14 days, 70km.

AAD8008. Ringed 10/07/2018 as a first-year bird at Papercourt Marshes, Send, Surrey. Retrapped at Knepp on 05/08/2018. 26 days, 37km.

Blackbird

LK48650. Ringed 14/12/2017 as an adult female at Knepp. Retrapped by a ringer on 17/03/2018 at Landguard Point, Felixstowe, Suffolk. 93 days, 160km.

Redwing

10X15738. Ringed 12/11/2016 as a first-year bird at Tielt, West-Vlaanderen, **Belgium**. Retrapped at Knepp on 11/02/2017. 91 days, 260km.

Robin

S646656. Ringed 05/11/2017 as an adult at Knepp. Found sick / dying (cause unknown) on 14/11/2017 at Farnham, Surrey. 9 days, 42km.

Dunnoek

TZ56783. Ringed 16/09/2018 as a first-year bird at Knepp. Found freshly dead, having hit a window on 01/08/2019 at Horsham. 319 days, 8km.

Lesser Redpoll

APE1868. Ringed 18/10/2018 as a first-year male at Knepp. Retrapped by a ringer on 14/11/2018 at Sandwich Bay, Kent. 27 days, 127km.

Goldfinch

S093151. Ringed 24/08/2016 as a first-year bird at Knepp. Retrapped by a ringer on 06/10/2016 at Blackgate Lane, Henfield, West Sussex. 43 days, 9km.

Outreach

The group are always happy to show visitors what we are doing as long as we have the time available without impacting upon bird welfare. This usually means avoiding the busy first hour or so after dawn. When safaris coincide with our normal ringing sessions they are welcome to attend a short ringing demonstration and these seem to be well received by the guests. It is our intention to trial 'bird ringing safaris' where participants can join us for a more extended period and gain a greater insight into our research.

Contributors

The core members of the group are Sophie Brown, Tony Davis, Tara Dempsey, Dave Green, Penny Green, Laurie Jackson, James McCulloch and Connie Tremlett. Others who have assisted on occasion are Adham Ashton-Butt, Mya Bambrick, Lee Barber, Josie Hewitt, Chris Hewson and Marcus Ward.

Acknowledgements

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Adult male Lesser Redpoll