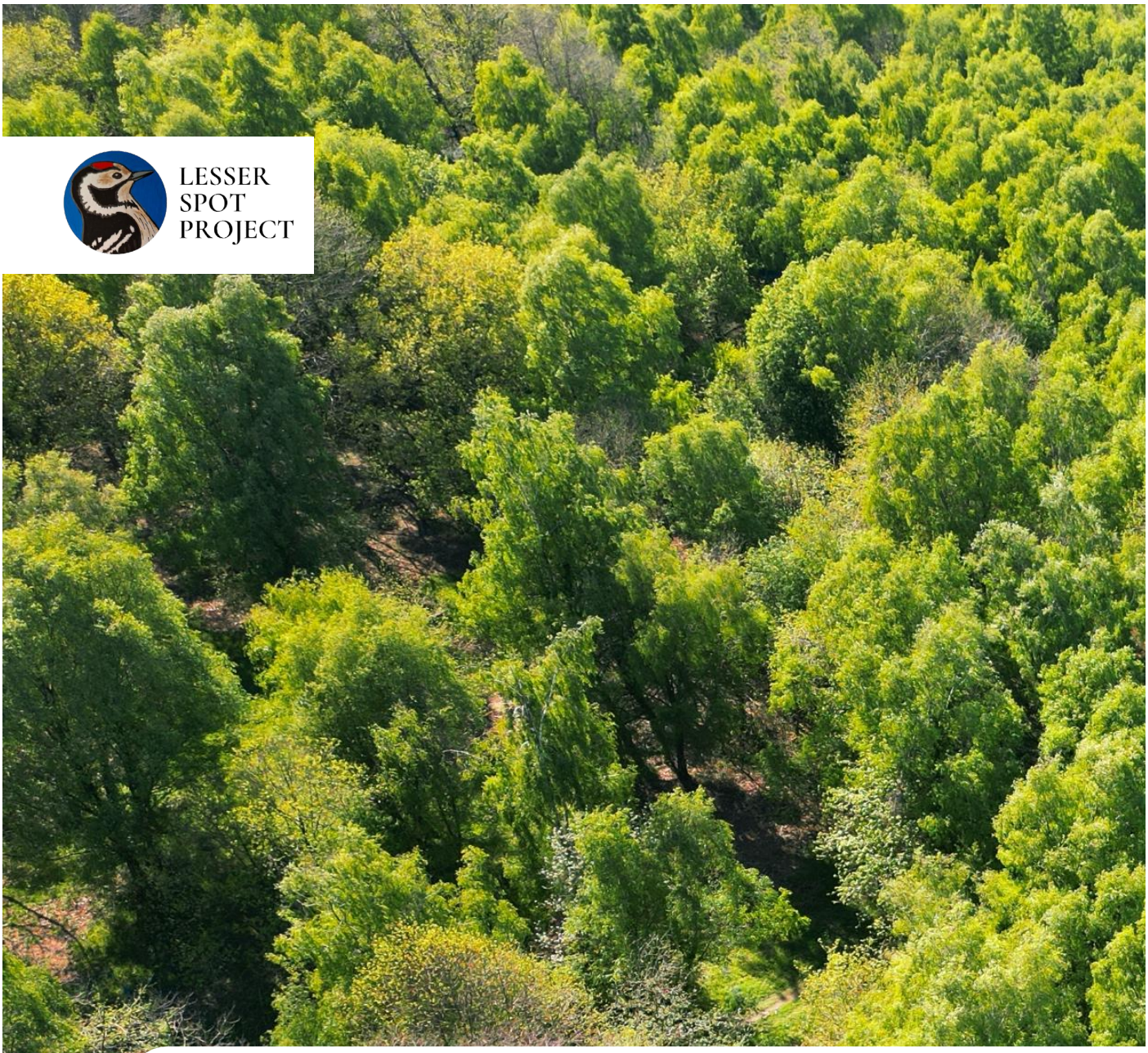


LESSER SPOT PROJECT

Gloucestershire and Avon Lesser Spot Project

Rufus Dawson

Final Report



Gloucestershire and Avon Lesser Spotted Woodpecker Project

Final Project Report, 27 August 2026.

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Gerard Gorman, Ken and Linda Smith, Stuart Keenor, Toby Fountain, Gus Robin, Simon Gillings and Jack Baddams all leant their enormous expertise on lesser spotted woodpecker in various ways, and to whom I'm very grateful.

Many thanks also to William Lambourne, for his thoughts and advice on many different aspects of the project. Thank you to Tara Okon for providing such a fantastic logo.

Finally, I'd like to extend my enormous thanks to all 25 landowners for their invaluable support, which was crucial to the project's great success. There are too many to name here, and I'm unable to list their names to protect the locations of sites, but to each landowner I'm extremely grateful.

> **Please Note:** In order to keep sites unidentifiable, maps have deliberately been drawn slightly imprecisely. Whilst the scale is still useful, many complex woodland shapes have been drawn as simple polygons. This approach should be kept in mind when looking at the maps in this report.

Executive Summary

Like much of the rest of the UK, the population of lesser spotted woodpecker (*Dryobates minor*) in Gloucestershire and Avon is thought to be enormously unrecorded. The project hypothesis was that lesser spotted woodpecker (referred to throughout as LSW) may be present in habitat types that are not considered typical and may therefore be significantly more abundant and widespread in the project region than thought. Hence, the question:

"What habitats are preferred by LSW in Gloucestershire and Avon, and how can these habitats be defined?"

To answer this question during Autumn/Winter 2025, thousands of LSW records were acquired and analysed. A points-based site selection system was developed, which considered both total number of records and number of recent records, at each site. This led to the identification of 25 target sites across Avon, the Cotswolds, the Severn Vale and the Forest of Dean for recorder deployment. Landowners were contacted, who generously gave their permission for monitoring to take place.

From 14 February to 11 April 2026, monitoring took place at the 25 sites, following the methodology set out in this report. This included the placement of song meters, acoustic analysis, post-detection surveys, habitat/vegetation surveys and climate monitoring.

Evidence of LSW was found at 9 of the 25 sites we actively monitored. This was considered an enormously successful result given the low numbers of LSW records in the counties in recent years. Amongst the project records was the first multi-day record of LSW presence at a site in Avon since 2012. Details of the vocalisation data, including sonograms and recordings, are included in the individual site descriptions.

Analysis of a further 5 sites with sightings from 2026 was included, bringing the total number of LSW sites studied as part of the project to 14.

The habitat of many confirmed sites was noticeably different from what is considered typical for LSW. Notably this included territories in beech (*Fagus Sylvatica*)-dominated woodland. Further details of each site are set out in detail in the report, including photographs, maps and habitat notes (including analysis of woodland composition; and snag and deadwood abundance).

The methodology used in this project (including the site identification process, monitoring equipment and analysis tools) proved to be highly effective, enabling LSW detections in areas without recorded sightings from the past few years.

Whilst not the focus of the project, other rare woodland birds were identified, including a goshawk (*Accipiter nisus*) territory in Avon – only the third such site recorded in the county, and one of only two currently active.

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Introduction

The lesser spotted woodpecker (*Dryobates minor*) is one of Britain's fastest declining birds. Whilst estimates vary considerably, most suggest a 70-85% decrease in the UK population since the 1970s (BTO, 2020), with a predicted 600 pairs remaining (BTO, 2015). The cause of this decline is largely unknown, but it is thought likely to be a combination of multiple factors. Low productivity during breeding is thought to be one of the primary drivers (*Charman et al*., 2012).

Whilst undoubtedly declining, LSW are also one of Britain's most under-recorded birds. Their small size, elusive nature (through most of the year) and behaviour (which involves spending a great amount of time high up in the canopy) make the odds of a chance encounter with a LSW highly unlikely.

To help rectify decades of under-recording, Ken and Linda Smith set up the Woodpecker Network in 2015. Volunteers find and report LSW breeding evidence to the organisation, who have been involved in the monitoring of 172 nests (Woodpecker Network, 2025).

The counties of Gloucestershire and Avon are in an important location, positioned between LSW woodpecker strongholds in Herefordshire, Worcestershire, Wiltshire and Somerset. Yet little is known about LSW in the region. The project aimed to answer the question: **What habitats are preferred by LSW in Gloucestershire and Avon, and how can these habitats be defined?**

To approach this question, the Gloucestershire/Avon area was first broken down into regions. Gloucestershire is a diverse county, consisting of three highly geologically distinct main regions: the Severn Vale, Forest of Dean and the Cotswolds. The fourth project region was Avon.

It is known from recent records that birds are persisting in all four regions, albeit at a low density, therefore the first issue to consider was how LSW were managing to utilise different habitats in these vastly different landscapes.

Neither Gloucestershire nor Avon had ever previously benefitted from specific, targeted surveying for the species before. Therefore, this project was an extremely exciting opportunity to use innovative new technology to monitor this rare species.



Photo Credit: Alex George, 2026

Methodology

Site Selection Process

All verified records of LSW in Gloucestershire and Avon were gathered from national and local biological recording organisations, county recorders and individuals. The data was mapped and categorised by record age and seasonality - distinguishing between the territorial and non-territorial season.

Target survey sites were determined using a weighted scoring system. For the purposes of this stage a 'site' was defined as a 1km square. This approach was selected to align with the maximum Spring territory size of LSW (Wiktander *et al*, 2001). Highest priority was given to sites showing both a high density of historical sightings and documented persistence since 2010. A shortlist of sites was developed, and landowners contacted regarding permissions for the project.

Due to land ownership issues, certain high-scoring squares were inaccessible and omitted from the project. Where spatial ambiguity arose from low-resolution grid references in the original records, attempts were made to contact observers directly.



Monitoring Protocol

Presence/absence surveys were carried out during the period February-April, utilising Song Meter Micro 2 passive acoustic recorders (PARs) across selected 1km squares. The approach taken to PAR positioning varied for each site, however recorders were generally positioned within areas of mature, structurally diverse woodland that were considered suitable for LSW foraging or drumming. The devices were configured to a recording cycle starting 90 minutes before dawn and finishing 90 minutes after dusk. Devices were placed for a minimum six days, with extensions to the deployment time considered to compensate for adverse weather conditions that might suppress LSW vocalisation.

Acoustic Analysis

Data gained was analysed by the Woodpecker Module of the British Trust for Ornithology (BTO) Acoustic Pipeline (when available), as well as a BirdNET single-species classification (with a minimum confidence threshold of 0.25). **Each LSW detection was manually validated.** The number of LSW detections on each recorder is shown in the relevant site description section of this report, alongside the number of great spotted woodpecker (Dendrocopus major) - referred to as GSW - detections, which are also shown for interest.

Post Detection Surveys

Following the recorder analysis, sites returning confirmed LSW detections were subject to secondary, observer surveys later in the breeding season. Such surveys, aided by the use of a Pulsar Axion XQ19 thermal imaging camera, were intended to document evidence of breeding activity - such as food-carrying, nest excavations and occupied nests.

Habitat and Vegetation Survey Protocol

Detailed structural vegetation and floristic data was collected from most confirmed sites, to quantify the habitat characteristics supporting LSW in the region. To evaluate canopy structure, mean tree height for every species prominent in the canopy was calculated utilizing a handheld digital clinometer with integrated laser rangefinder that automatically accounted for slope correction and baseline distance. Where possible, at least 10 trees/species were measured.

Standing deadwood availability (considered critical for the species) was assessed by calculating the average snag volume per hectare. This was calculated using a fixed-area belt transect method, measuring 4m wide by 100m long (total area 400m^2) per sample plot. Within each transect, the taper, height and diameter at breast height (DBH) were recorded for all snags exceeding a minimum diameter of 0.12m. Where this data is presented for each site a reference figure is given, taken from a study in Belgium (Delahaye *et al.*, 2010), showing what was found to be the mean and minimum snag volume/hectare for LSW territories.

Woodland composition data was gathered by recording all living canopy and understory stems within a transect size of at least 400m^2. The classification system developed by Clifford *et al.* (2004) was used, separating out individual trees into maturity classes. This data was plotted to create a visual representation.

These combined metrics aimed to build a structural profile of LSW territories in the region, whilst keeping site locations unidentifiable.

Climate Monitoring

A climate logging protocol was introduced as an exploratory pilot element of the project. Air temperature (°C) and relative humidity (%) were measured at one site per deployment changeover, recording data at 10-minute intervals over the PAR deployment period. These measurements were taken using a Lascar EL-USB-2 datalogger, deployed within the woodland interior at a standardized height of 1.5 meters from the ground. As a trial component of the project, this exploratory monitoring yielded limited interesting trends, however it was interesting to explore how this method might be scaled up in the future.

Regional Background

The Severn Vale	**5**
The Forest of Dean	**7**
The Cotswolds	**9**
Avon	**11**

Initial Consideration of Region: The Severn Vale

The Severn Vale is a low-lying area of land, extremely flat topographically, and characterised by the meandering River Severn. It stretches between the Forest of Dean to the West and the Cotswold Escarpment to the East.

8	Sites Studied
3	Sites Positive

Substantive, Mature Willow and Alder Dominated Riparian Corridor

Mature Traditional Orchard



Aerial Imagery: Google Earth/Copernicus (2024)

Riparian open woodland complex

Significant area of mature oak trees, with a substantial level of canopy dieback

(Please note that this map – and those that follow it - is intended solely to demonstrate characteristic habitat in a randomly selected, representative part of the region, and is not guided by records or known sites)

The Severn Vale holds a high county density of a well-documented LSW habitat: riparian strips. These are mainly composed of willow (*Salix* sp.), but alder (*Alnus glutinosa*) also features prominently in some areas. These two tree species are notable in LSW ecology, as they often serve as both nesting and foraging sites. Despite the conservation concern surrounding LSW, the species diet is still remarkably poorly understood – although the Bronze Alder Moth (*Argyresthia goedartella*) is recognized as an important food source within wet woodland habitats (Selås *et al.*, 2008).

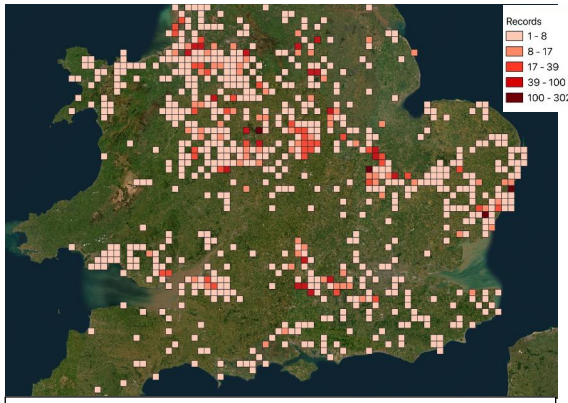


Figure 1: A map to show the distribution of the Bronze Alder Moth (*Argyresthia goedartella*). Like most insects, they are under-recorded, but records may serve as a rough indicator of areas of suitable habitat for LSW. Records mapped from GBIF data.

Whilst riparian strips alone can meet the basic ecological needs of LSW, territories in areas of low woodland coverage frequently span diverse habitat mosaics (Chiatante *et al.*, 2019). As a result, a large tree species like oak or beech is often present alongside wet woodland specialist species.

The Severn Vale was historically also an area which held a substantial number of mature traditional orchards – another well-documented LSW habitat. Mirroring the national trend, many of these orchards have been lost – within Gloucestershire overall, an estimated 75% have disappeared in the last fifty years (Gloucestershire Orchard Trust). A significant number of traditional orchards, nevertheless, remain in the region. Traditional orchards – even when small – have enabled LSW to colonise areas they would otherwise not, by providing nesting habitat rich in deadwood.

"It [LSW] occurs sparingly throughout the Severn Vale"

***Birds of Gloucestershire*, 1982**

"Rarely Recorded"

Notes on Birds in the Severn and Avon Vales, October 2025

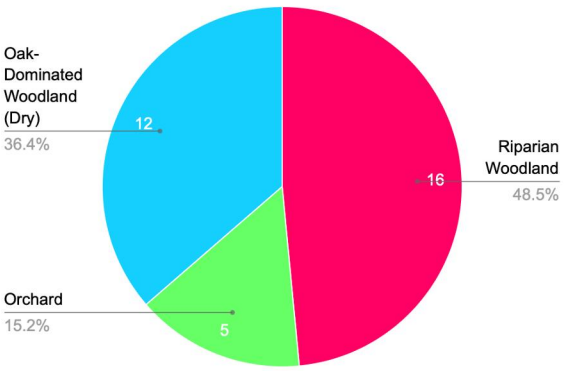


Figure 2: Likely habitat of LSW records held by the county recorder in the Severn Vale

Figure 2 shows the significance of Riparian Woodland for LSW in the Severn Vale – making up nearly half of all records. All the records of birds in W10 Oak Woodland came from one 5km^2 area – thus the significance of this habitat type to the birds is inflated in the chart. Note how orchard accounted for only 15.2% of the records.

Initial Consideration of Region: The Forest of Dean

The Forest of Dean lies in the west of Gloucestershire. It is largely owned by Forestry England and has been used for large-scale commercial forestry for hundreds of years. Forestry plays a large role in the management of the landscape to this day, as it remains a working forest. By comparison to the Severn Vale, the Cotswolds and Avon – it is a highly wooded landscape – with potential for large-scale connectivity that it virtually impossible in the other project regions.

8	Sites Studied
4	Sites Positive

Open, mature woodland, extremely diverse in composition – with a high density of snags and deadwood



Aerial Imagery: Google Earth/Copernicus (2026)

Large golf course. A high birch component can sometimes render golf courses vital resources for foraging LSW

Wide woodland ride. These have been noted to be important for LSW, but there is dispute over the exact reason why

The Forest of Dean is a highly fragmented habitat mosaic. It is in a large part ancient woodland, with W10 woodland being the predominant woodland vegetation community. Many areas are highly reminiscent of the New Forest, and animals like wild boar (*Sus scrofa*) help to maintain the vital wood pasture landscape. Many areas are also characterised by small brooks and streams – increasing invertebrate abundance.

This region has produced more LSW records than the other two regions of Gloucestershire combined, over the past 16 years. There can be no doubt that, historically at least, it has been a county stronghold for the birds – but it is also an observer stronghold.

The project dedicated much less time to monitoring the Forest of Dean than the other project regions, due to the already increased level of recording here.



Figure 3: A well-known, historic wet woodland LSW site in the Forest of Dean.

"Breeds locally… in the Forest of Dean and Wye Valley region"

***Birds of Gloucestershire*, 1982**

"The Forest of Dean is the county stronghold"

***The Birds of Gloucestershire*, 2013**

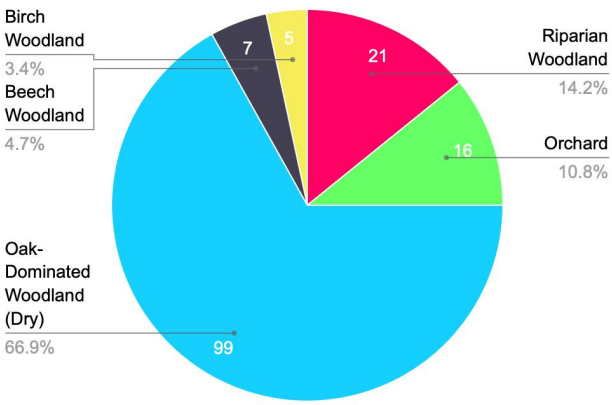


Figure 4: Habitat of LSW records held by the County Recorder in the Forest of Dean since 2010

Figure 4 demonstrates the importance of Oak-Dominated Woodland for LSW in the Forest of Dean.

Sightings data for this region is somewhat misleading, due to a small number of 'honeypot sites' that carried near-guaranteed sightings until the mid 2010s. Resultantly, the graph may overstate the significance of the Oak-Dominated Woodland habitat type for LSW – however it is certainly much more utilised in this region than in our other project regions.

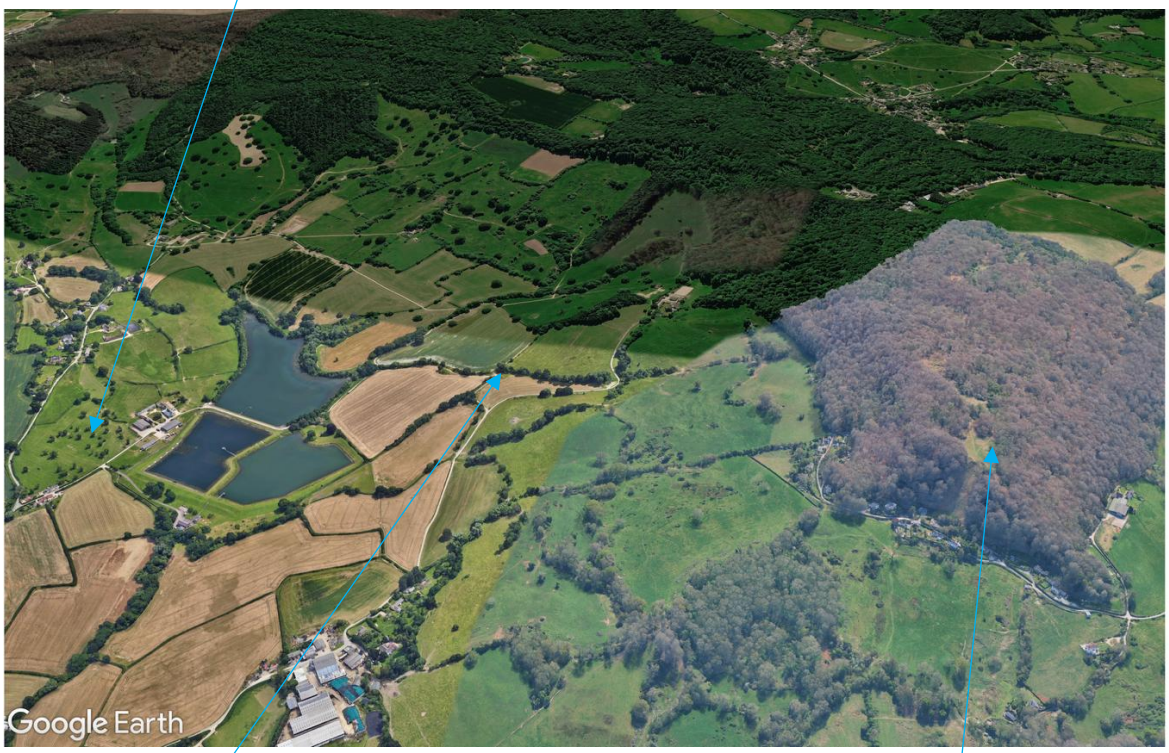
Also note the (comparative) insignificance of riparian woodland as a habitat type for LSW in the region.

Initial Consideration of Region: The Cotswolds

The Cotswolds lie in the East of Gloucestershire. Much of the region is situated on a band of Jurassic Oolite Limestone that weathers into thin, alkaline soils. This has major floristic implications. One of the most notable of these, and the most relevant to LSW, is the effect that this has on woodland composition; it is the geology of the area that gives rise to the region's characteristic beech-dominated woodland landscapes.

8	Sites Studied
3	Sites Positive

Traditional orchard. Whilst the Cotswolds were never a large part of the large orchard industry that the other Gloucestershire regions boasted in the 18th and 19th centuries, small-scale orchards were not uncommon - many of which persist to this day



Aerial Imagery: Google Earth/Vexcel Imaging US Inc./Airbus (2021 & 2025)

Riparian woodland strip dominated by mature alder. A great many field margins in Cotswold farms are like this.

Mature beech-dominated woodland

The Cotswolds were a region of particular interest. From the beginning of the project, it was suspected that LSW were disproportionately more under-recorded in this region than the other three project regions. Our data gathering and mapping project continued to build a picture of region with many, widespread records – but rarely more than two or three within one 1km square.

Considering previous records, the two most common habitat categories for were riparian woodland and beech-dominated woodland (see *Fig 5*). It is extremely common in the Cotswold hills for these two habitat types to converge, with brooks running down from the tops of the Cotswold hills creating riparian field margins on the lower slopes beneath. These are often dominated by alder – and it is from these kinds of situations that a sizeable proportion of Cotswold LSW records in riparian woodland have been produced.

Monitoring these areas raised several difficulties. The beech-dominated woodland areas of the Cotswolds are generally homogonous in maturity. It is therefore difficult to predict the drumming area of birds – and hence recorder placement. The second problem arose during the permission stage of the project, when considering where to place recorders in riparian strips and wet field margins. These areas are generally on the private land of farmers and individuals – both identifying and gaining permission from these landowners can be tricky, and not always possible.

"It [LSW] occurs locally in the Cotswolds"

***Birds of Gloucestershire*, 1982**

"A species that is in danger of disappearing from the region"

Birds of the Cotswolds, 2009

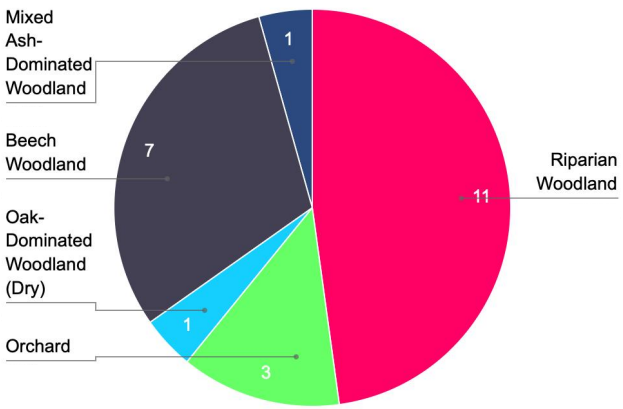


Fig 5: Likely habitat of LSW records held by the County Recorder in the Cotswolds since 2010

One of the standout features of *Fig 5* is the significance of beech-dominated woodland for LSW in the Cotswolds, compared to the other regions. It is noted that birds do still utilise some of the few orchards and pockets of oak-dominated woodland. Whilst the total number of records is very low (23), the lack of prominence given to mixed ash-dominated woodland (1 record) is another standout feature – given the much greater representation this habitat type has in nearby Avon.

Initial Consideration of Region: Avon

Avon is a diverse county, consisting of many varied habitats; however it largely lacks the extensive oak-dominated woodlands that are historically linked to LSW. Whilst perhaps dominated by the city of Bristol, it includes the wider North Somerset and South Gloucestershire regions. In most places, the countryside is very agricultural – and this is reflected in a very fragmented woodland landscape.

6	Sites Monitored
1+	Sites Positive



Aerial Imagery: Google Earth/Copernicus (2023 & 2025)

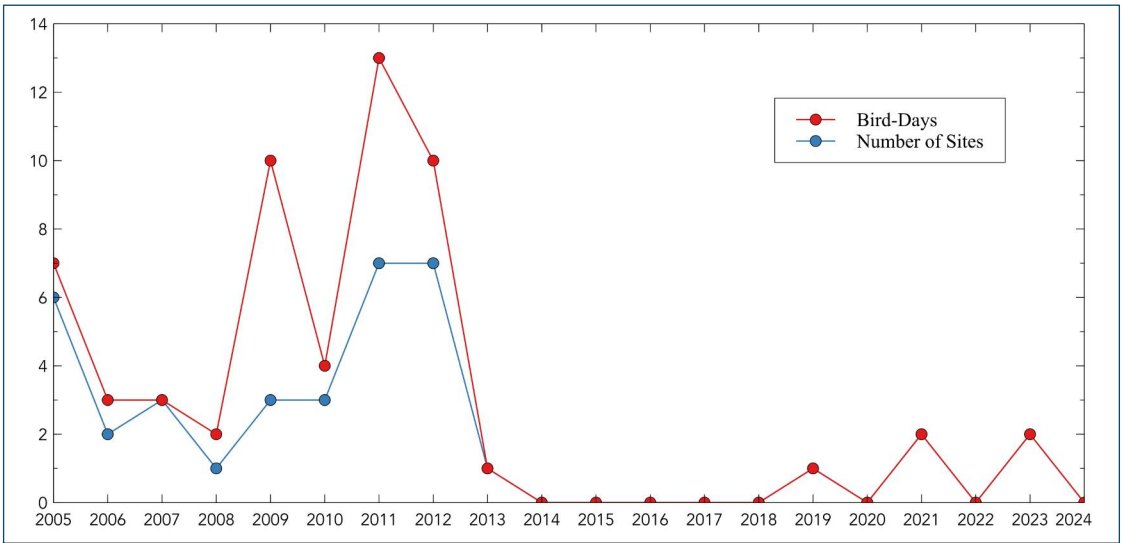


Figure 6: Avon LSW records since 2005 (source: Avon Bird Reports/Avon County Recorder Data)

Of all the project regions, Avon has produced the fewest recent records. Proving continued territorial presence in the county was an aim of the project.

Several standout points are raised looking at recent data in *Fig 6*. The first is the unexpected drop-off in records in the year 2013, after a steady annual increase the number of sites at which LSW were recorded. Most interestingly however is that, in the case of every single site since 2013, the reported bird was sighted on one day only. It is interesting to note that birds are persisting in some form in the region – and yet regular, territorial behaviour is seldom recorded.

The last confirmed Avon record was in 2023, and the last confirmed breeding was in 2003.

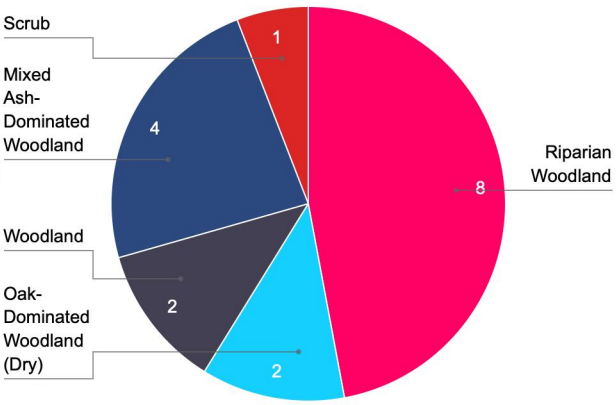


Figure 7: Likely habitat of LSW records held by the county recorder in the region since 2010

What perhaps stands out the most in *Fig 7* is the prominence of Mixed Ash-Dominated Woodland (nearly a quarter of all records). This is a widespread and common habitat in the region, and not one typically linked to LSW. Surprisingly, riparian woodland was still the most common habitat type for LSW records – despite this being relatively uncommon in Avon.

Confirmed LSW Study Site Descriptions

Site 1, Gloucestershire	**14**
Site 2, Gloucestershire	**18**
Site 3, Gloucestershire	**22**
Site 4, Avon	**24**
Site 5, Gloucestershire Border	**30**
Site 6, Gloucestershire	**34**
Site 7, Avon - Possible	**37**
Site 8, Gloucestershire	**38**
Site 9, Gloucestershire	**38**
Site 10, Gloucestershire	**38**
Site 11, Gloucestershire	**39**
Site 12, Gloucestershire	**39**

Site 1, Gloucestershire



Figure 8: A map showing the study area at Site 1

Site 1 was selected on the basis that it had produced several LSW records, though none from the past couple of years.

1.1 Vocalisations

A total of 67 LSW vocalisations were recorded over a deployment period of seven days. Note the avoidance of the area around recorder A despite an abundance of deadwood.

Recorder	LSW Calls	LSW Drums	GSW Vocs
A	0	0	1,254 (7 dates)
B	8 (1 date)	0	41 (5 dates)
C	30 (3 dates)	29 (5 dates)	1,458 (5 dates)

Table 1: Vocalisations on each recorder

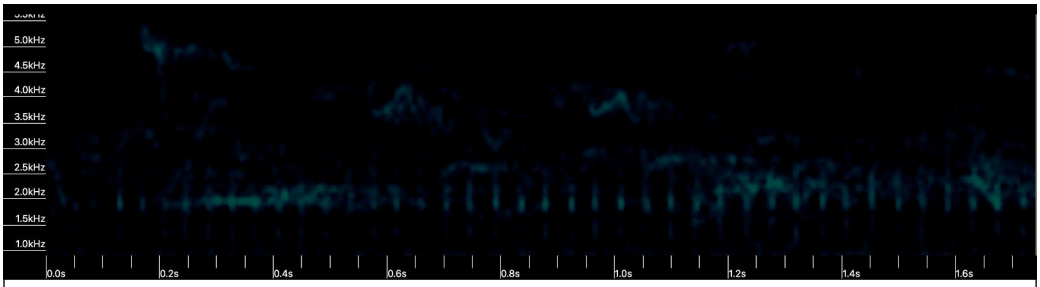


Figure 9: Lesser Spotted Woodpecker **drum**, Site 1, 30/03/2026. Recorder **C**

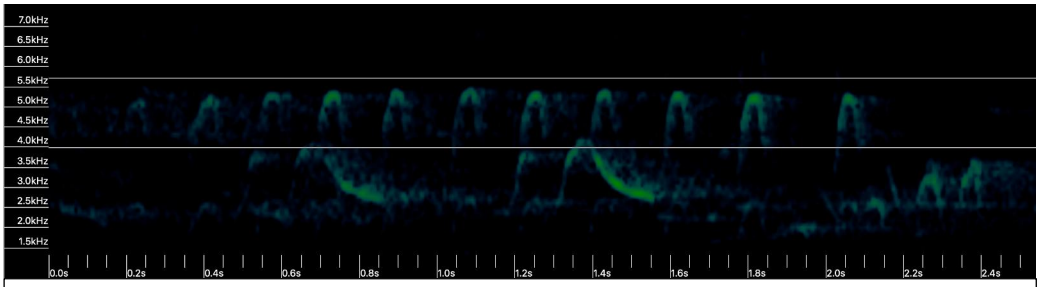


Figure 10: Lesser Spotted Woodpecker **call**, Site 1, 02/04/2026. Recorder **C**

The call is shown in between the two white lines

1.2 Woodland Composition

To simplify discussion around woodland composition, the woodland was divided into 4 compartments (see *Fig 8*). These were all notably distinct in composition.

Much of the territory was highly dominated by silver birch (*Betula pendula*), reminiscent of key LSW hotspots in the New Forest and Sherwood Forest. Indeed, the canopy in Compartment 1 was almost exclusively composed of birch. Only one burst of LSW vocalisations (calls) were recorded throughout the monitoring period in Compartment 1, further suggesting that whilst a part of the territory, it is an area used solely for foraging during the day.

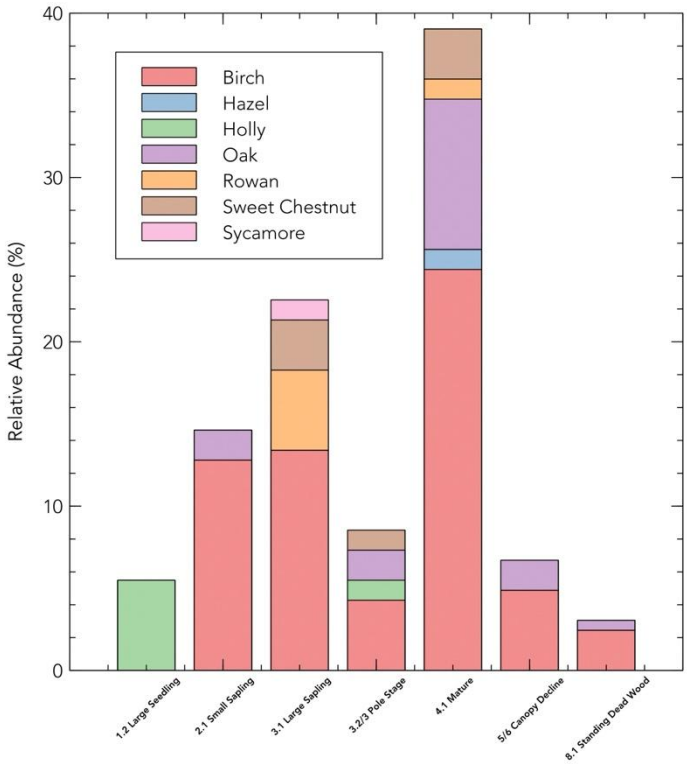


Figure 11: Woodland Composition by Species and Stage, Compartment 2, Site 1

Compartment 1 was at the top of the slope, Compartment 4 at the bottom. In Compartment 2, tree species additional to birch started to emerge, mostly oak spp. (both *Quercus robur* and *Quercus petraea*) and sweet chestnut (*Castanea sativa*). Concerningly, there was extremely little woodland regeneration in this area, category 1.2 in *Fig 11* consisting of holly (*Ilex aquifolium*) alone. As a result, there was little understory and a relatively single-storey woodland.

Extreme deer grazing pressures are clearly a factor behind the little regeneration shown in *Fig 11*. Roe deer (*Capreolus capreolus*) were noted during all site visits. Muntjac deer (*Muntiacus reevesi*) have also been recorded frequently at the site, though none were recorded during site visits for the project.

The effect of this high level of deer browsing on the future of this locally important woodland is a cause for concern.

Compartment 3 was unable to be thoroughly surveyed due to access restrictions but was broadly of a similar composition to Compartment 2. Compartment 4 was alder (*Alnus glutinosa*)-dominated. Area D was a large traditional orchard, dominated by apple (*Malus domestica*) trees, backing on to more broadleaf woodland on all sides.

1.3 Topography and Effects

Mean Oak Canopy Height, Compartment 2 (meters)	18.2m (n=8)
Mean Oak Canopy Height, Compartment 1 (meters)	14.5m (n=9)
Mean Birch Canopy Height, throughout	15.6m (n=11)

Table 2: The mean height of various canopy-level tree species, and their location within the study site

The territory was spread over a north facing slope, spanning a 50m elevation change with a relatively constant gradient. Many tree species could be found throughout – however oak was much more prevalent in the lower areas of the territory. Therefore Compartment 1 represented a homogenous woodland structure, with a very regular canopy height.

As illustrated in *Fig 11*, birch and oak were the two dominant species in the 4.1 Mature and 5/6 Canopy Decline stages. While the average birch tree height was relatively constant throughout, the average oak canopy height decreased with an increase in elevation. This trend was highly notable, as oak was generally the dominant species in the top-level canopy in Compartment 2, leaving the slightly smaller birch trees 'sheltered' by the oak canopy. Although the oak height difference compared to oak trees in Compartment 1 was only 3.7 meters, the variation was ecologically significant as it allowed birch to become the species dominant in the upper canopy.

1.4 Snag and Deadwood Abundance

Site 1
9.025m³ Snag Vol/Hectare

<2m³ LSW Avoid	9m³ LSW Mean
Snag Vol/Hectare	
2010 Study, Belgium	

Standing deadwood volume at Site 1 is highly comparable to the mean conditions for LSW found in a study in Belgium[3].

A significant proportion of mature, canopy-level trees (14.7%) were noted to be in a canopy decline stage.

1.5 Other Scarce Woodland Birds Noted

Also present were breeding Hawfinch (Coccothraustes coccothraustes), Crossbill (Loxia curvirostra), Marsh Tit (Poecile palustris), and Goshawk (Accipiter gentilis).

1.6 Site Summary

It is considered very likely that this site holds at least one pair of LSW. A visual observation of a bird in late May flying towards the traditional orchard would suggest possible breeding in this area. However this was unable to be confirmed due to access issues.

The site encompassed a wide range of invertebrate-rich habitats. It is possible that two pairs may utilise the wider site, as there was more suitable habitat outside the study site boundaries. Further monitoring in the wider area may yield interesting results.

Follow up visits were made to attempt to confirm breeding. Several potential cavities were found, however these were checked with the project thermal camera and found to be inactive. It was on one of these trips that the bird was observed in flight towards the orchard, which was certainly of an age/maturity viable to support breeding LSW.



Figure 12: The canopy structure of the area around Recorder **C** (where drumming was detected). Note the structural complexity and deadwood component.

Site 2, Gloucestershire

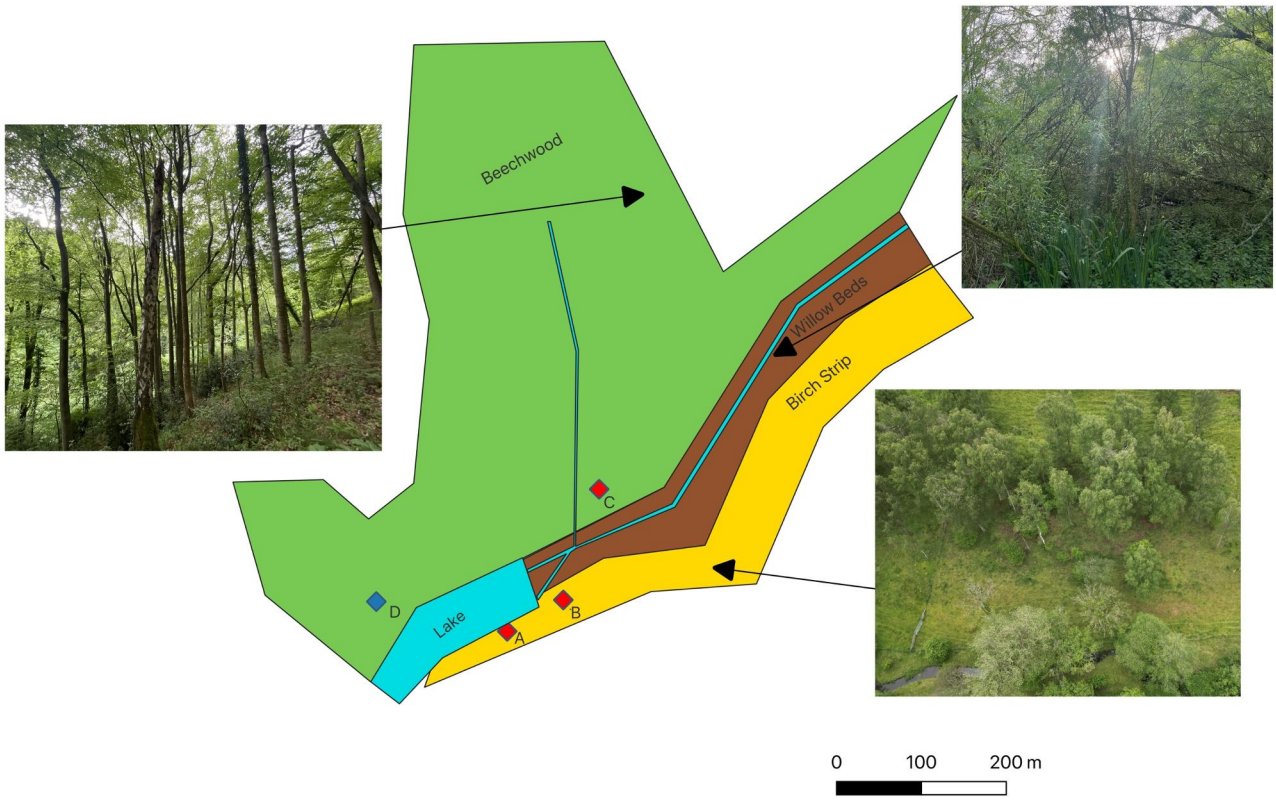


Figure 13: A map showing the LSW territory at Site 2

Site 2 was selected on the basis of three LSW records, though these records were mostly unverified. The most recent potential record was from the Winter of 2022.

2.1 Vocalisations

A total of 39 LSW vocalisations were detected over a deployment period of eight days. Three recorders were deployed - however the project had permission to place recorders only in a small part of the wider site. Drumming detected on recorders A and B (in the birch strip area) is likely to have occurred in the two mature oak trees that were interspersed within the birch area.

Recorder	LSW Calls	LSW Drums	GSW Vocs
A	0	9 (4 dates)	0
B	1 (1 date)	19 (7 dates)	1566 (8 dates)
C	0	6 (3 dates)	895 (8 dates)

Table 3: Vocalisations on each recorder

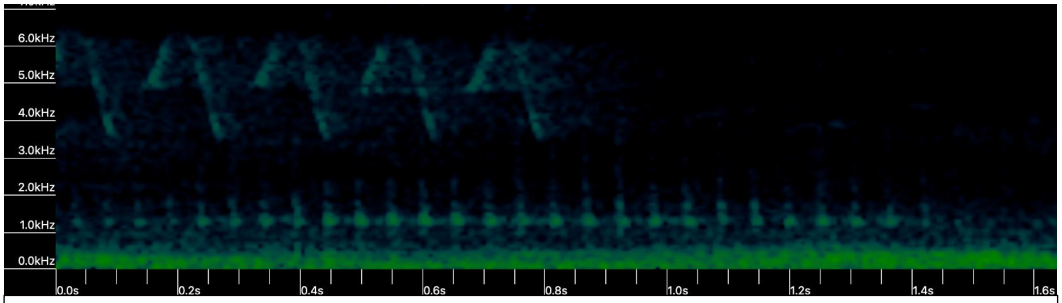


Figure 14: Lesser Spotted Woodpecker **drum**, Site 2, 16/03/2026. Recorder **B**

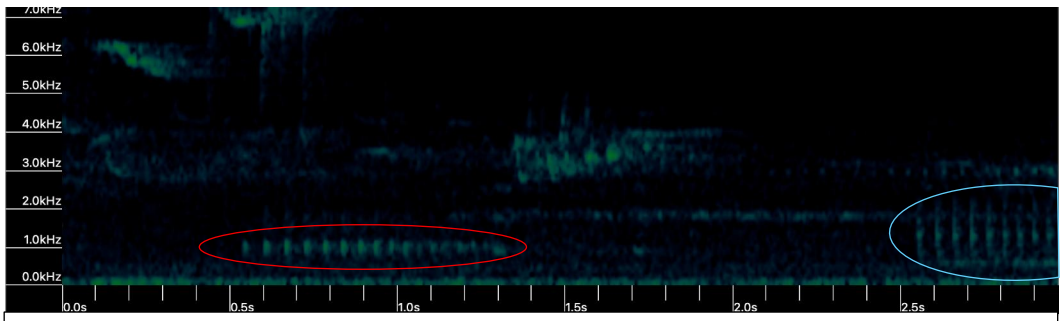


Figure 15: A Greater Spotted Woodpecker drum (red) followed by the start of a Lesser Spotted Woodpecker **drum** (blue), Site 2, 21/03/2026. Recorder **A**

2.2 Woodland Composition

Site 2 was complex, involving several different habitat types that were considered favourable for LSW. Initially, the most obvious of these was a 10-acre birch-dominated woodland strip, spanning almost a kilometre in length. The project did not have permission from the landowner to access this part of the site, hence in-depth on-site surveying was not possible. Song meters were deployed on the border of this area (and LSW were heard in this area even when just deploying these recorders).



Figure 12: a map to show the birch strip (red), willow beds (blue) and beech-dominated wood (green).

Another area of the site judged to be suitable for LSW were the mature willow beds, dominated by grey willow (Salix cinerea). The landowner took great pride in maintaining the water quality of the brook that created the wet conditions for the willows. In additional to the willow, an impressive array of marsh flora was observed, such as marsh-marigold (Caltha palustris) and yellow flag iris (Iris pseudacorus). An exceptional number of invertebrates was present. It was judged that this area could also represent a significant foraging resource for the birds.

The beech-dominated wood was the third significant area of the site. It is to be noted that, as can be seen in the image as part of *Fig 13*, there were extremely low levels of standing deadwood – and the beech trees were not at such a stage of maturity as for the crown of live trees to consist of dead limbs.

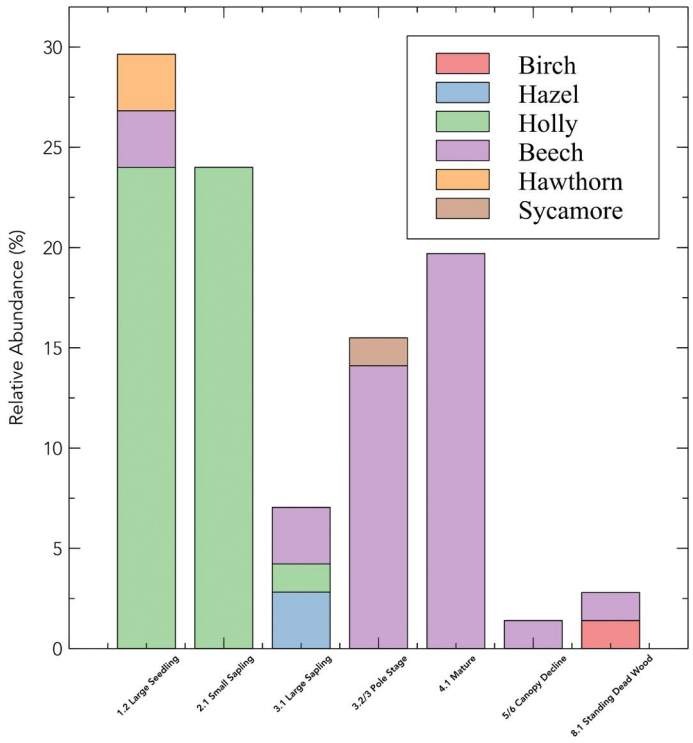


Figure 13: Woodland Composition by Species and Stage, beech-dominated wood at Site 2

Mean Canopy Beech Height Beech-Dominated Wood	21.2m (n=10)
Mean Canopy Birch Height Birch-Dominated Strip	17.9m (n=10)
Two Oaks Birch-Dominated Strip	14.2m, 10.4m

Table 4: The mean height of various canopy-level tree species, and their location within the study site

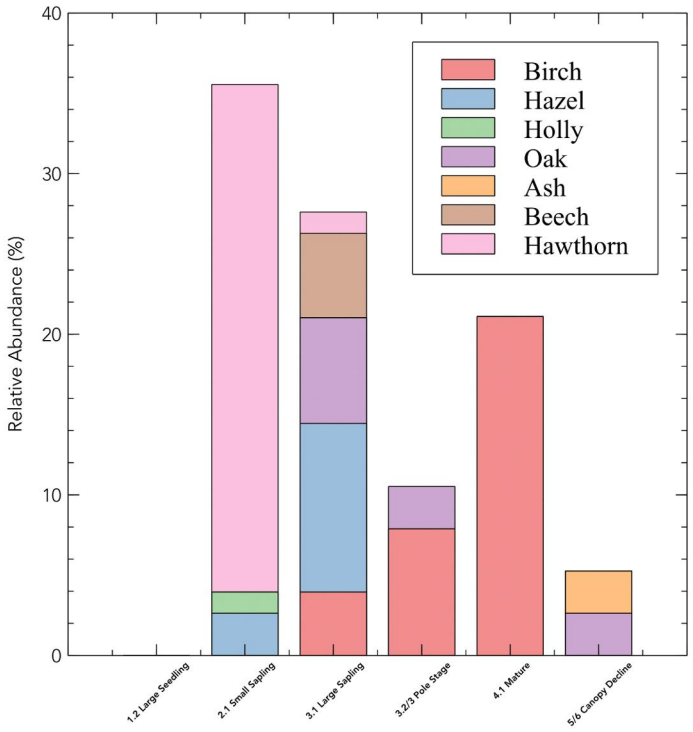


Figure 14: Woodland Composition by Species and Stage, birch-dominated wood at Site 2

2.3 Topography and Effects

The site was positioned in the base of a steep-sided valley. The extended brook area along the valley was thought to likely become an invaluable resource in the Winter (when LSW roam large distances), for providing the conditions for a constant food source of invertebrates. Indeed a (relatively) recent Winter record of a LSW was seen from an area only 2km downstream of the site – likely one of the birds from Site 2.

2.4 Snag and Deadwood Abundance

Site 2, Beech-Dominated Wood

2.51m³

Snag Vol/Hectare

<2m³ LSW Avoid **9m³** LSW Mean

Snag Vol/Hectare

2010 Study, Belgium

Standing deadwood volume at Site 2 was extremely low, especially when compared with the Belgian study. The sustained LSW presence at the site is likely due to the mosaic of insect-rich habitats providing enough year-round invertebrate supply to support the birds.

The two oak trees in the accessible part of the birch strip had a significant level of crown dieback, but otherwise few dead limbs were present on live trees.

2.5 Other Scarce Woodland Birds Noted

Also present were Marsh Tit (Poecile palustris) and Goshawk (Accipiter gentilis).

2.6 Site Summary

Whilst no definitive proof was gathered that more than one bird was present at Site 2, it is thought likely from recordings that two may have been present. A recorder was placed at a site one kilometre downstream - however this came back negative.

A post-monitoring visit was conducted to attempt to gather breeding evidence, but this was unsuccessful. Given the amount of suitable habitat that was inaccessible, this was considered unsurprising.



Figure 15: An aerial view of Site 2

Site 3, Gloucestershire

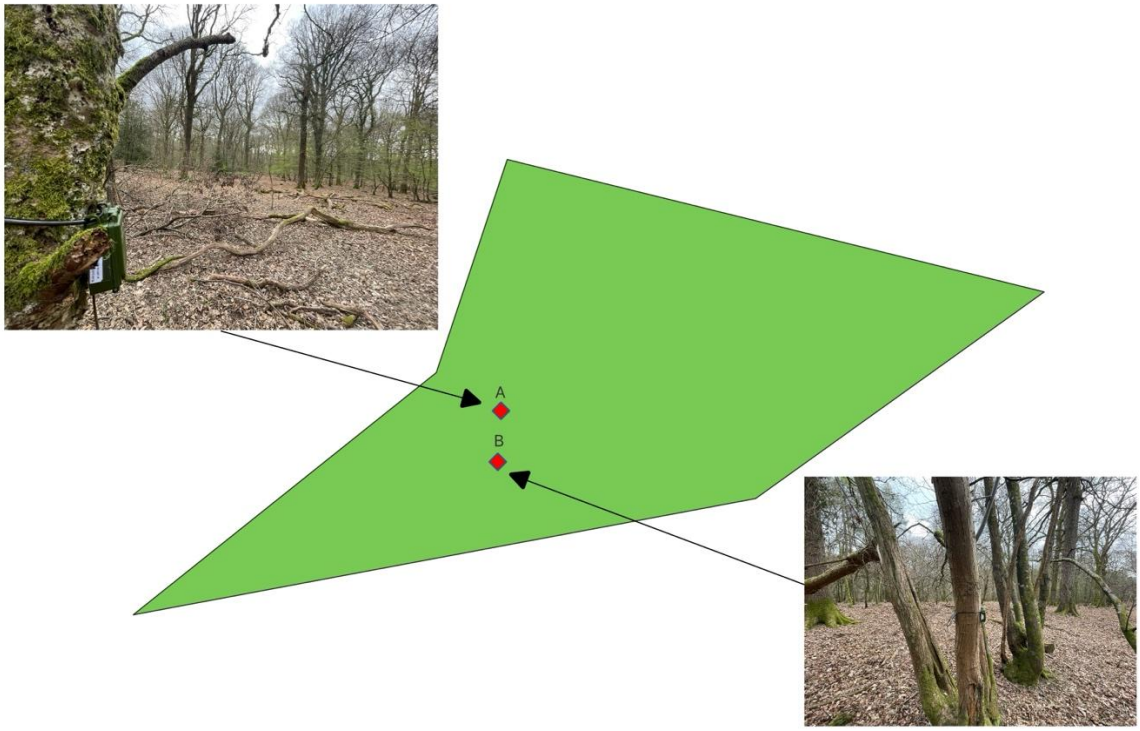


Figure 16: A map showing the study area at Site 3

The landowner of Site 3 contacted the project in early Spring to report repeated observations of a bird at Site 3 in 2025. The site was of particular interest, not just due to the site's location (it is very near to several other project LSW sites), but also the atypical habitat. Due to a lack of viable spatial data on the individual detected, it was judged that many measurements of habitat taken at other sites would not be relevant here.

3.1 Vocalisations

Recorders were deployed for nine days in the location where a female LSW was observed last year by the landowner. Recorder placement was difficult to approach due to the atypical habitat. It was also decided that minimal resource would be put into the site, given the high odds of detecting birds (due to such recent, accurately georeferenced records). As a result of this approach, only two recorders were deployed to confirm presence/absence. These recorders were place on either side of the location of the record received from the landowner.

Recorder	Calls	Drums	GSW Vocs
A	19 (4 days)	0	426 (9 days)
B	29 (3 days)	0	379 (8 days)

Table 5: Vocalisations on each recorder

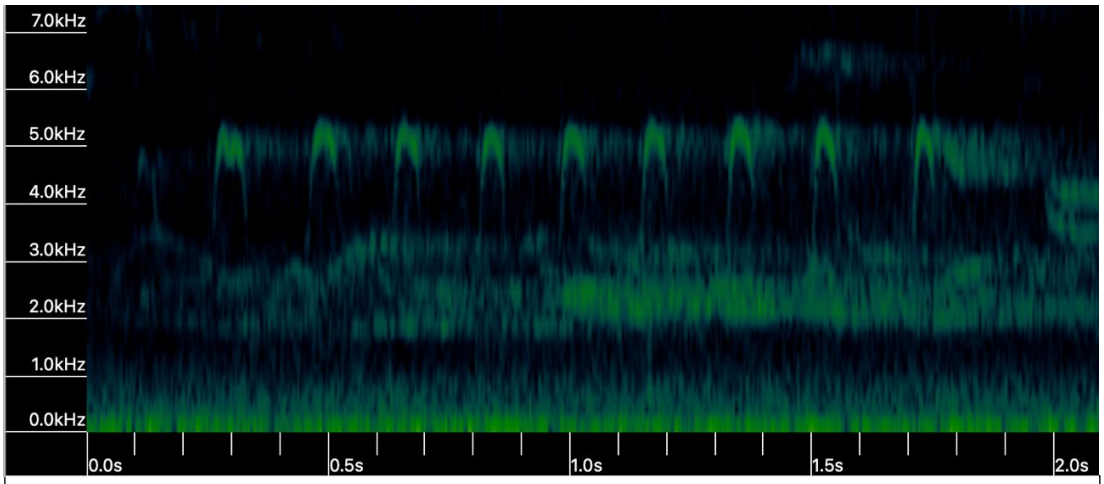


Figure 17: Lesser Spotted Woodpecker **call**, Site 3, 05/04/2026. Recorder **B**

3.2 Woodland Composition

In the area where LSW were recorded, the overriding woodland structure was very homogenous. Oak was the predominant species in the canopy, although there was a much smaller beech component. Interestingly, there was very little standing dead wood. Many of the oaks had smaller dead limbs, but no snags were observed and relatively few large dead limbs were observed (compared to the typical level for the species). It was noted that, had a specific location not been received from the landowner, this area of the site would probably have been overlooked.

3.3 Topography and Effects

The woodland area in which Site 3 was located was generally constant in elevation. Several brooks – within steep ditches – were noted, however not plotted (so these are not shown on the map). Generally, the watercourses were bordered by a mixture of birch and alder – more reminiscent of well-documented LSW habitat.

These brooks flowed to a small woodland lake, circa 300m from the area where LSW were detected.

3.4 Other Scarce Woodland Birds Noted

Also present was Hawfinch (Coccothraustes coccothraustes).

Site 4, Avon



Figure 17: A map showing the study area at Site 4

Site 4 was selected after several recent, anecdotal records were unearthed by the project.

4.1 Vocalisations

Due to the large nature of the site, a recorder was deployed within each suitable, distinct area of woodland. Recorders were placed for eight days. Due to a recorder malfunction, recorder J only recorded for three days.

The landowner was regrettably unable to grant us access to Block 7. To monitor birds using this area, Recorder J was placed in a small area of trees that was thought may be used as a 'stopover point' for birds moving between this woodland block and the rest of the site. However, this can't be relied upon as a reliable indicator of usage, and it is still firmly believed that this is likely to be an integral part of a territory for reasons stated in Section 4.2.

Other than the possible drum recorded on Recorder J, all other recordings came from Blocks 3 and 4. Vocalisations on all recorders were recorded on very few days. The study area of the site was based, as usual, from records data, however it is suspected that the territory may extend to the North-West of block 3. Deployments in parts of Block 2 may be worthwhile to further define territory boundaries.

Recorder	LSW Calls	LSW Drums	GSW Voc.
A	0	0	983 (8 days)
B	0	3 (2 days)	1,459 (8 days)
C	0	0	1,797 (8 days)
D	0	3 (2 days)	958 (8 days)
E	1 Prob (1 day)	4 (1 day)	265 (8 days)
F	0	0	155 (8 days)
G	0	0	236 (7 days)
H	0	0	170 (7 days)
I	0	0	0
J	0	1 Poss (1 day)	155 (3 days)

Table 6: Vocalisations on each recorder

Detections of drumming LSW came from all sections of these woodland blocks, except for Block 4B. It is notable that this area had the least structural complexity (see *Figs 20*, *21*, *22* and *23* in Section 4.2). Woodland structurally complexity has an impact on many environmental factors, including invertebrate abundance (Rogerson *et al*, 2026). This may therefore increase the foraging value of an area for LSW. Whilst drumming can take place anywhere within the territory, it is possible that it is the case that birds have a general aversion to utilising a part of the site that is the least ecologically favourable for foraging.

Two recent records were obtained, from separate observers. These are shown on the map as Point 1, which is the location of a bird seen in scrub during the breeding season. It was understood that this bird then proceeded to fly into Block 2. Point 2 was of a bird seen outside the breeding season.

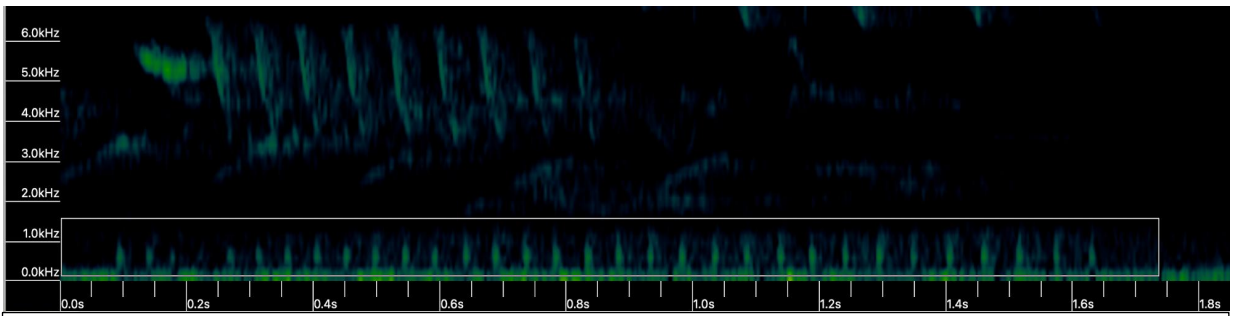


Figure 18 Lesser Spotted Woodpecker **drum**, Site 4, 28/02/2026. Recorder **B**

4.2 Woodland Composition

Site 4 was amongst the largest sites studied. Each woodland block was numbered one-eight (as shown in *Fig 17*) and will be referred to here in this way.

Blocks 3 and 4 were particularly complex, and of particular significance due to the LSW detections in this area. For this reason, they were broken down into smaller sections (as shown on *Fig 19*) and the composition of each section surveyed.

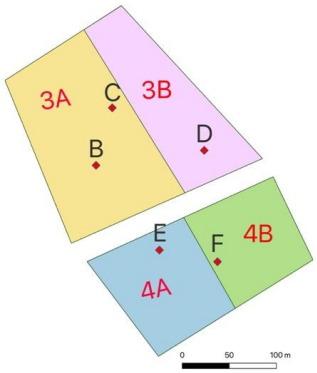


Figure 19: A map of the sections of Blocks 3 and 4

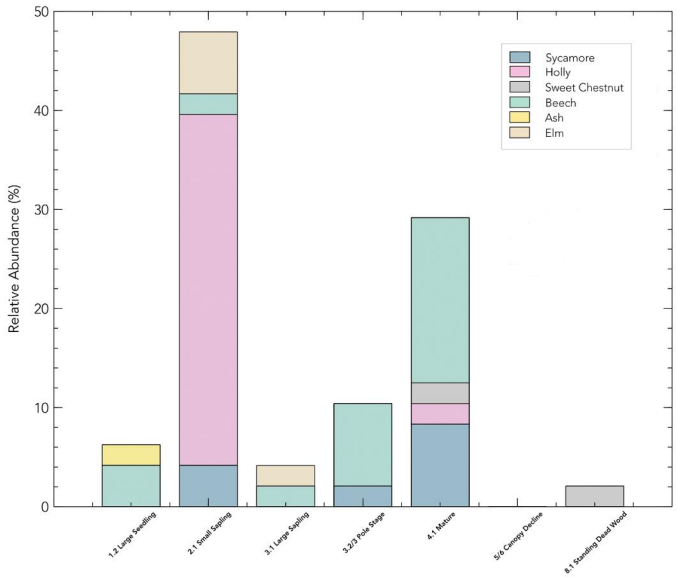


Figure 20: 3A Composition

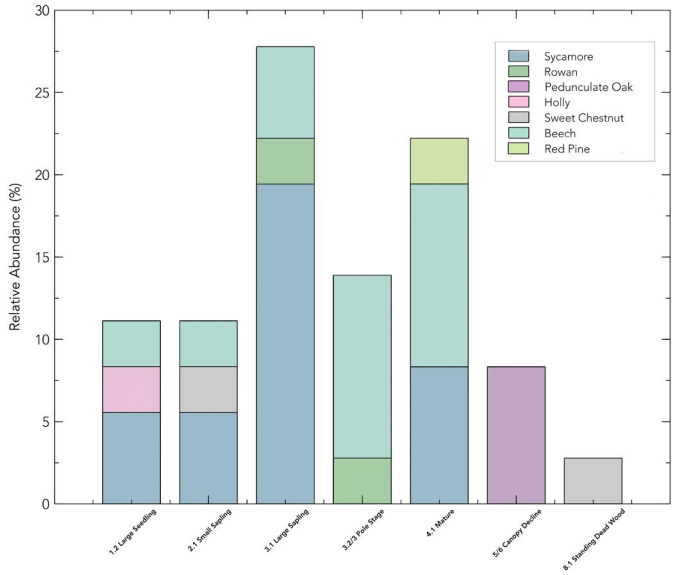


Figure 21: 3B Composition

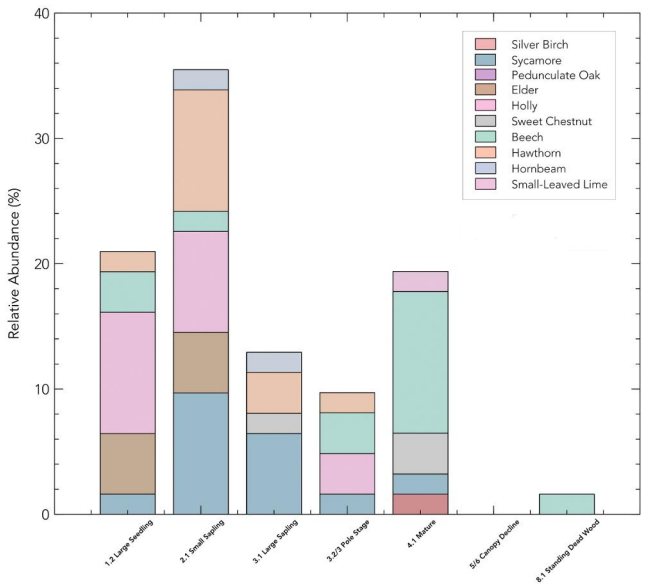


Figure 22: 4A Composition

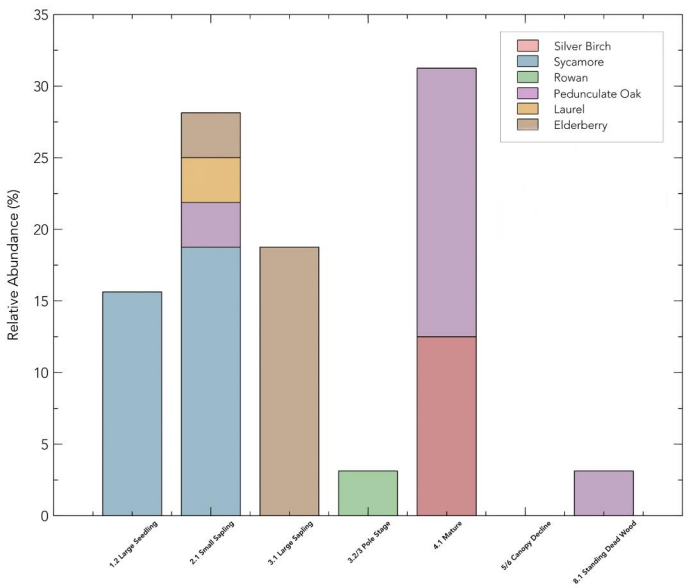


Figure 23: 4B Composition

The site was an extremely diverse one, with a wide variety of different woodland types. The blocks considered most suitable to support LSW were numbers 2, 3, 4 and 7 – and it was in these areas that monitoring efforts were focussed. Unfortunately, the landowner was unable to grant access to Block 7 at the time, so a creative approach to surveying this area was taken (outlined in Section 4.1).

As can be seen in *Figs 20*, *21*, *22* and *23*, Blocks 3 and 4 varied substantially in composition. The most structurally complex area was Block 4A and the least complex areas were Blocks 4B and 3A. First considering Blocks 4A and 4B - as well as structural complexity the tree species within the mature class also varied enormously. In Block 4A, beech was dominant with a mixture of sweet chestnut, silver birch, holly and sycamore (*Acer pseudoplatanus*) present in addition. Few of these species were present in the canopy of Block 4B, which was dominated by silver birch and pedunculate oak. The canopy of this area was much more open as well, allowing the understory to become choked with grasses – reducing regeneration. Blocks 3A and 3B were more similar, although there were still some differences like the presence of oak in 3B.

Block 7 was noted to be the only area of wet woodland habitat at the site. Whilst detailed surveying was unfortunately not possible in this area due to access issues, the woodland composition was judged from afar to be dominated by mature willow (*Salix* spp.) trees, with a smaller oak component. Deadwood was abundant, especially on the woodland edges where both standing and fallen dead willow trees were noted. This type of habitat is rare in Avon. It was considered to represent exceptional foraging habitat for LSW.

The suitability of Block 2 for LSW varied throughout. In the South area, where recorders were deployed, the canopy was oak-dominated. There was an understory choked with dense pioneer silver birch stems in places, and other areas where the birch had become fairly mature – though these areas were seldom extensive. This may be where the bird was observed to fly to in the sighting at Point 1 (see section 4.3).

Blocks 5 and 6 were considered to be of very little value to LSW, due to their composition (coniferous in places), and small size. Whilst it would be plausible that these areas are used infrequently, it was not wished to put too much resource into exploring these woodland blocks.

The habitat of Block 1 was considered suitable for LSW in places. Like Block 2, access issues prevented us from recording in these areas – but this may be an area worth deployment in the future. One recorder was deployed in this block, in a large poplar stand. However the project was unable to record in other areas of this block, which were oak-dominated, and the potential significance of this area is discussed in section 4.3.

A noticeable change in the species dominant in the upper canopy occurred between blocks 3A and 3B. In 3A, Beech was dominant. In 3B, Sycamore was dominant.

Beech Area 3A	22.7m (n=6)
Beech Area 3B	17.8m (n=4)
Sycamore Area 3A	20.6m (n=4)
Sycamore Area 3B	21.8m (n=5)

Table 7: The mean height of various canopy-level tree species, and their location within the study site

(Fewer height samples could be taken at this site, due to bushy mid-story growth restricting line-of-sight to canopy for most trees)

4.3 Topography and Effects

Other than the wet woodland at Block 7, the site lacked any woodland pools, streams or marshy areas. General invertebrate abundance was maintained by the large area of meadows surrounding many of the woodland blocks, as well as expansive areas of scrub (in the area around Point 1).



Figure 24: A view of Site 4

4.4 Snag and Deadwood Abundance

Site 4, Block 3

80.2m³

Snag Vol/Hectare

<2m³ LSW Avoid **9m³** LSW Mean

Snag Vol/Hectare

2010 Study, Belgium

An exceptionally large number of standing dead, mature trees rendered Site 4 the highest Snag Vol/Ha of the project. Many GSW cavities were observed utilising the snags in these areas.

Many trees had some level of crown dieback.

4.5 Other Scarce Woodland Birds Noted

Also present was Crossbill (Loxia curvirostra).

4.6 Site Summary

Due to the relatively few LSW detections despite the large-scale effort, it is predicted with near certainty that a maximum of only one pair of LSW is present at Site 4. Whilst blocks 3 and 4 were certainly a part of the territory, the full extent of this territory is unknown. Further survey work in a future year covering the areas North and West of Block 3 would be of enormous benefit.

How and if Block 7 is utilised by the birds remains to be seen. If this block is used by the birds, it is surprising that birds were not recorded in areas between here and Blocks 3/4 (Block 2, or the scrubby band where Recorder J was positioned). However, Point 1 – the recent breeding season record – may plausibly consist of a bird moving between this area and Block 2.



Figure 25: A photograph of an area near Point 1/Recorder J

The exceptionally high snag abundance in the areas of the site where drumming was recorded (Blocks 3 and 4) is testament to the good land management at the site. Doubtless it is this notable factor, known to be important to LSW, that sets Site 4 apart from similar sites in Avon

Site 5, Gloucestershire/Herefordshire Border

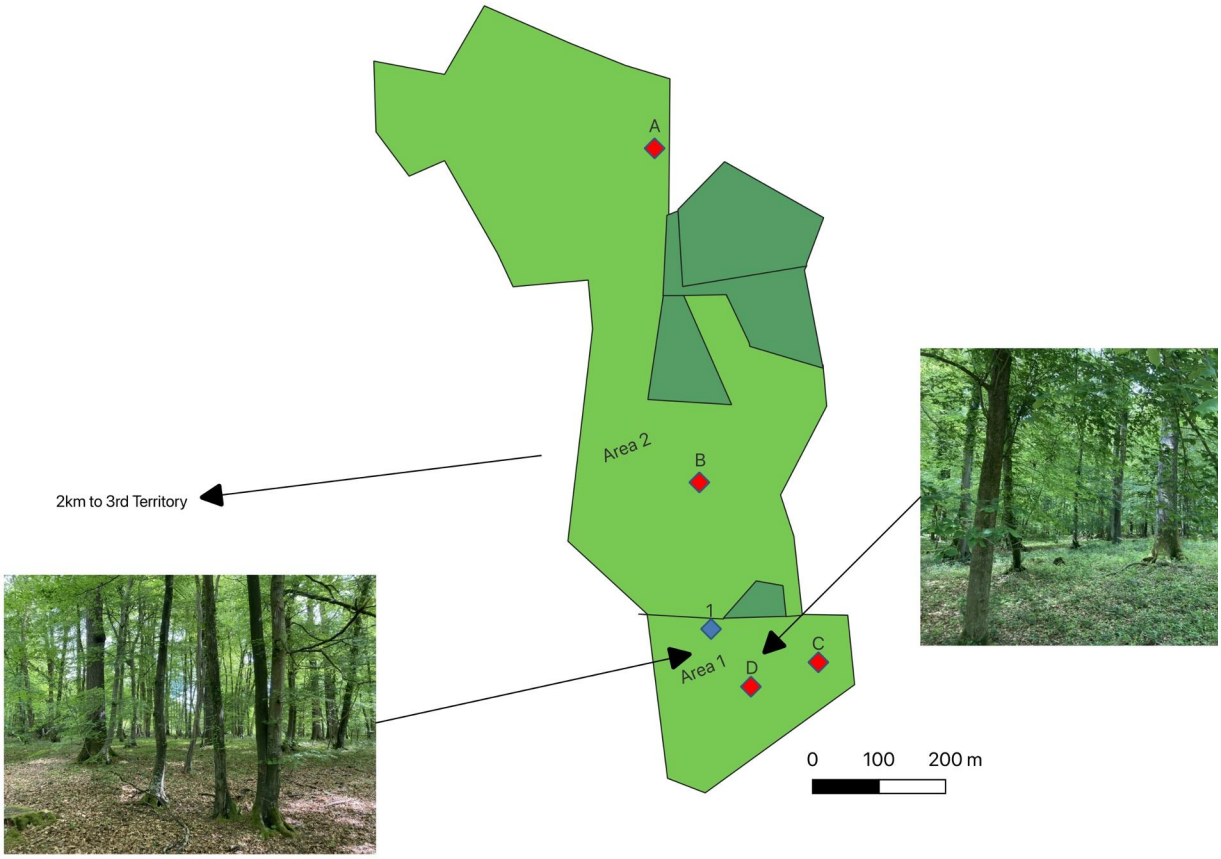


Figure 26: A map showing the study area at Site 5

5.1 Vocalisations

Recorders **C** and **D** were deployed within the 2025 territory (Area 1).

Recorders **A** and **B** were deployed by Stuart Keenor, who leads the South Wales LSW project, and who has kindly permitted their inclusion in this report for the purpose of completeness. Stuart's recorders were placed exploratively, to assess whether there might be a second territory within what is a large woodland system. The birds detected on recorder **A** are highly likely to be different from the birds recorded on recorders **B**, **C** and **D**.

Recorder	LSW Calls	LSW Drums	GSW Voc.
A	0	6 (unknown)	Unknown
B	1 (1 day)	9 (unknown)	Unknown
C	80 (7 days)	812 (7 days)	569 (8 days)
D	151 (6 days)	255 (8 days)	461 (8 days)

Table 7: Vocalisations on each recorder

The especially large number of calls on recorder **D** likely links to a bird excavating a cavity very nearby to the recorder, during the deployment period.

Recorder **D** was placed in an area with far more standing dead wood than Recorder **C**, hence was predicated to yield more drumming detections. This was not the case, possibly because of birds actively avoiding the area because of the nest excavation.

Point **1** is the general area in which LSW calls were heard during the breeding season (late May).

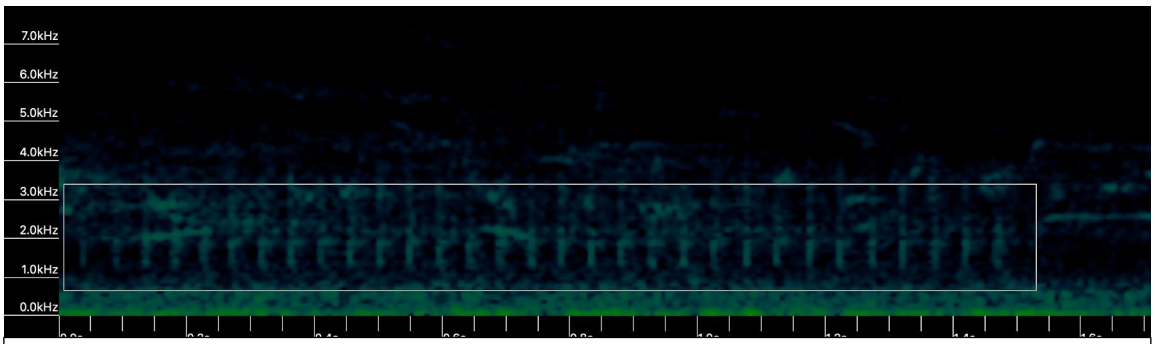


Figure 27: Lesser Spotted Woodpecker **drum**, Site 5, 11/04/2026. Recorder **C**

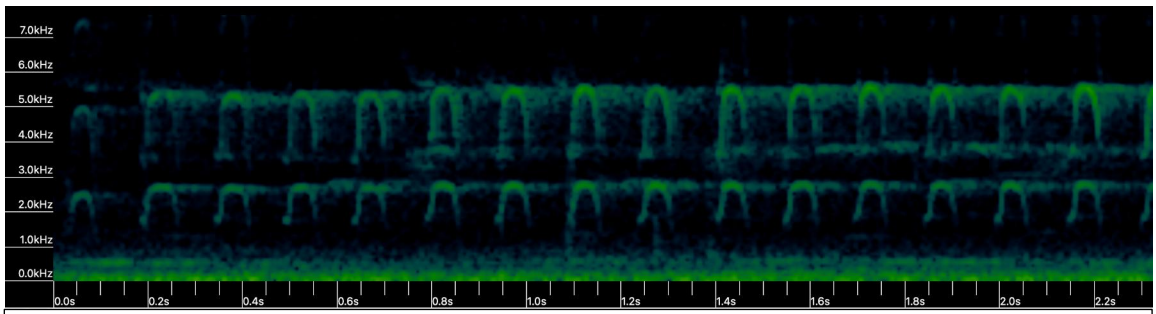


Figure 28: Lesser Spotted Woodpecker **call**, Site 5, 09/04/2026. Recorder **D**

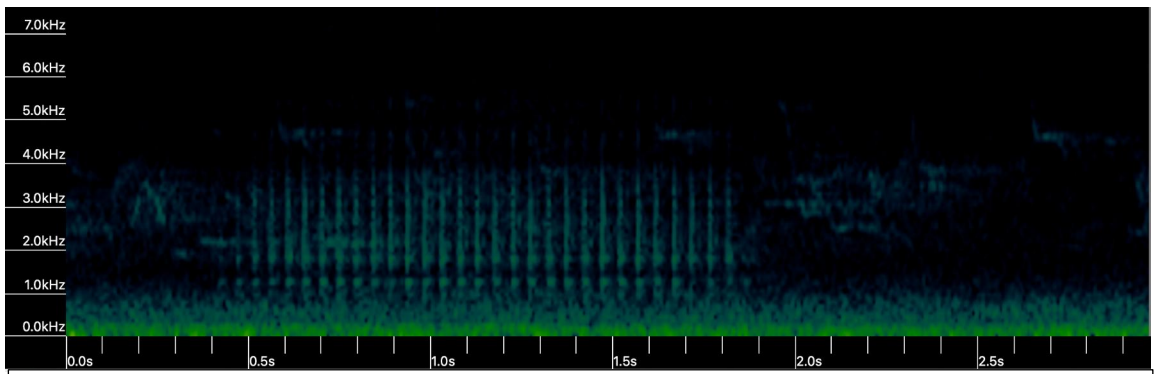


Figure 29: Lesser Spotted Woodpecker **drum**, Site 5, 06/04/2026. Recorder **C**

5.2 Woodland Composition

The study area at Site 5 was part of a large, geologically diverse woodland complex. **Area 1** (the main LSW area) was arboreally much like many other woodlands in the project region (especially those with limestone soils).

The canopy in **Area 1** was observed to be beech-dominated, in most areas. Woodland density was highly variable throughout, with several small glades and openings.

Oak spp. were also present, most individuals with some crown dieback. No entirely dead, standing oak trees were observed anywhere on site.

The regeneration of the woodland (see *Fig 30*) was considered much healthier than in most comparable areas of Gloucestershire, like many parts of the Cotswolds. As a result, there was greatly increased structural diversity.

Area 2 was extremely variable in composition. In the Southern area, woodland composition was similar to that in **Area 1**. The Northern area had a much larger birch component. No project-specific surveying was carried out in the Northern area of Area 2.

Mean Oak Height Area 1	22.92 (n=6)
Mean Beech Height Area 1	20.4m (n=10)

Table 8: The mean height of various canopy-level tree species, and their location within the study site

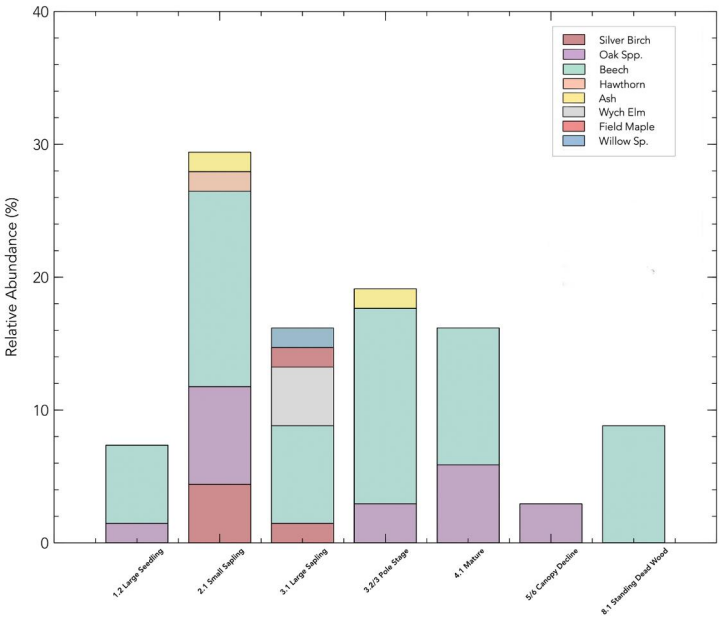


Figure 30: Woodland Composition in Area 1.

5.3 Topography and Effects

No pools, streams or watercourses were noted in **Area 1**. This area of the study site was relatively flat with only minor undulations in elevation. Rushes were present in parts of the understory, suggesting a wet field layer. Other areas were not surveyed.

5.4 Snag and Deadwood Abundance

Site 5, Area 1

28.0m³

Snag Vol/Hectare

A significant number of standing dead beech trees at site 5 gave rose to a high snag density. A cavity (see page 41) was excavated in one of these snags.

<2m³ LSW Avoid **9m³** LSW Mean

Snag Vol/Hectare

2010 Study, Belgium

Many of the oak trees present had a significant level of crown dieback.

5.5 Other Scarce Woodland Birds Noted

Crossbill, Hawfinch and Goshawk were also noted at the site.

4.6 Site Summary

This area almost certainly holds the largest number of semi-contiguous LSW territories in the study region. Multiple nearby areas had also been marked for surveying; however the project schedule did not enable these to be monitored. Two 2026 records from an area east of the study site were also received, however recorders were regrettably unable to be deployed in this area.

Thank you to Stuart Keenor for permitting the inclusion of some of his data in this section of the report. The site was also intensively monitored by a couple of other observers – who cannot be named to protect the anonymity of the site – many thanks to them, also.

Further discussion on the nest excavation detailed in Section 5.3 can be found on page 41.



Figure 31: A view of the study site

Site 6, Gloucestershire

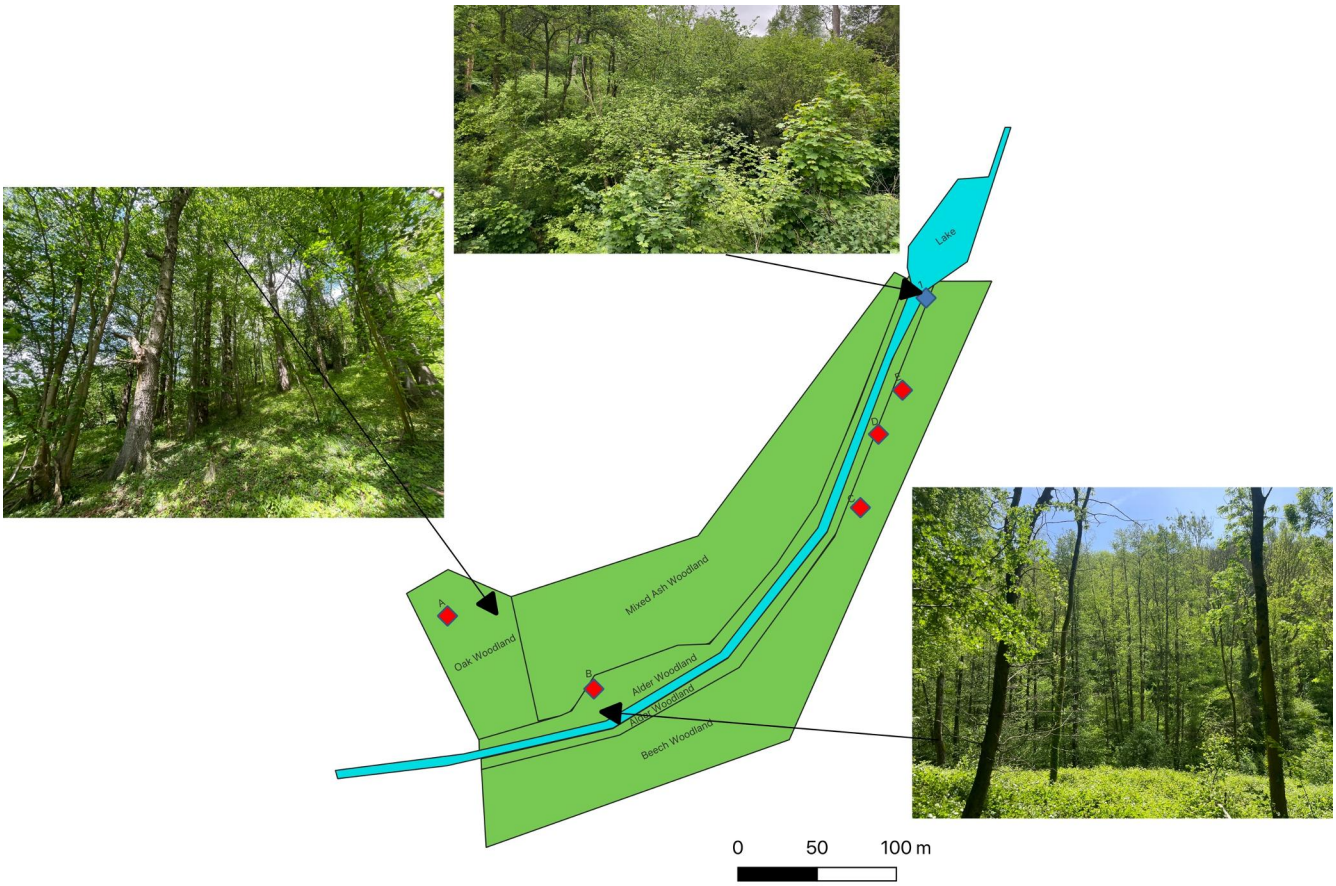


Figure 32: A map showing the study area at Site 6

The most recent record from Site 6 was of a (probable) pair in the Spring of 2023. Multiple follow-up visits by the landowner were unsuccessful.

6.1 Vocalisations

Three LSW vocalisations were detected at Site 6, some distance from the location of the original record. The lack of detections from recorders in riparian alder section (recorders B, C, D and E) is notable, however this habitat was plentiful in other areas that weren't monitored.

Recorder	LSW Calls	LSW Drums	GSW Voc.
A	0	3 (1 day)	2,403 (8 days)
B	1 Poss (1 day)	0	2,580 (8 days)
C	0	0	110 (7 days)
D	0	0	138 (7 days)
E	0	0	126 (7 days)

Table 9: Vocalisations on each recorder

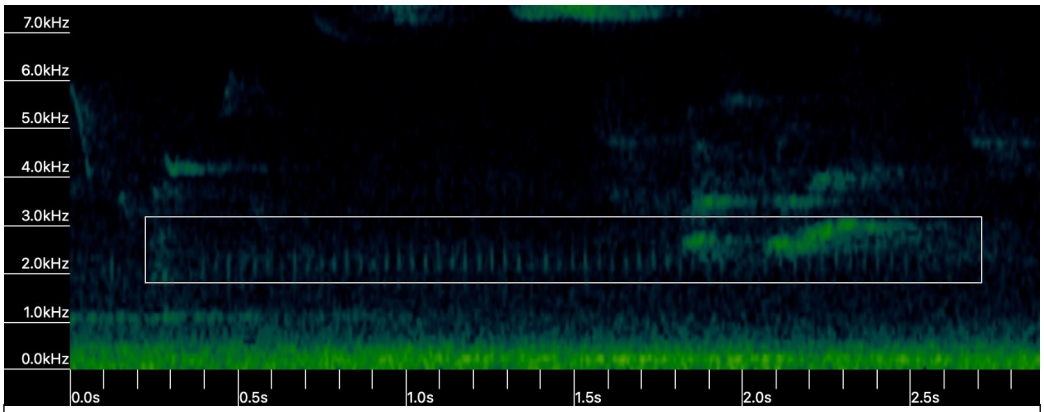


Figure 33: Lesser Spotted Woodpecker **drum**, Site 6, 28/03/2026. Recorder **A**

6.2 Woodland Composition

A typical Cotswold valley woodland, the wider woodland area surrounding Site 6 was generally beech-dominated. The landowner specifically manages the wood for biodiversity, deliberately retaining snags for woodpecker conservation.

The woodland generally separated into sections: oak-dominated woodland, ash-dominated woodland, beech-dominated woodland and alder woodland. These extent of these areas is shown on *Fig 32*.

The alder woodland corridor was noted to be of very variable maturity. It certainly may serve as a valuable foraging source for the LSW – Site 6 is the perfect illustration of our proposed habitat usage model for LSW in the Cotswolds: drumming and (probably) nesting in the beechwoods and feeding in alder-dominated riparian strips.

Some of the ash-dominated woodland areas were observed to have significant dieback.

Mean Oak Height Area 1	22.92 (n=6)
Mean Beech Height Area 1	20.4m (n=10)

Table 10: The mean height of various canopy-level tree species, and their location within the study site

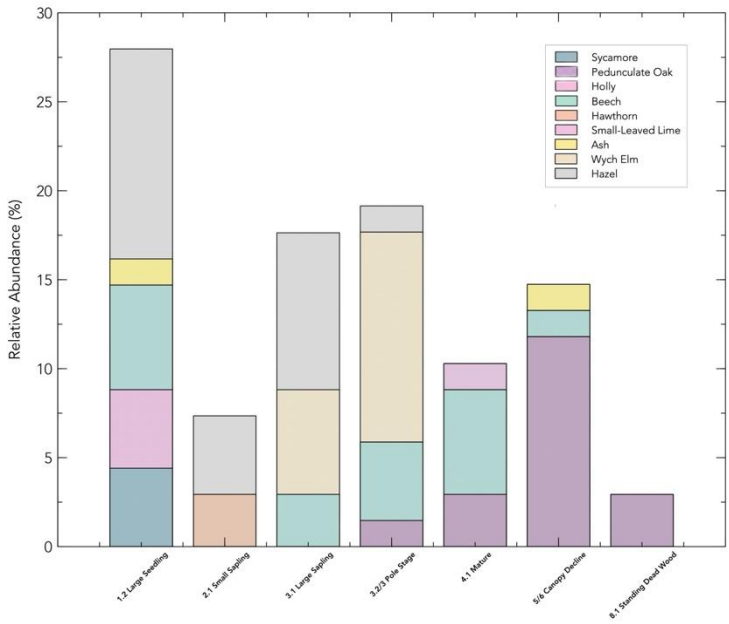


Figure 34: Woodland Composition in the Oak-Dominated area where vocalisations were detected

6.3 Topography and Effects

The study site was at the base of a beech-dominated valley. Large areas of bog were noted around the brook, giving rise to wet woodland flora like marsh-marigold.

6.4 Snag and Deadwood Abundance

Site 5, Area 1

28.9m³

Snag Vol/Hectare

A high snag density was present. In the area around the recorder with a LSW detection (recorder A), most snags were Oak sp.

<2m³ LSW Avoid **9m³** LSW Mean

Snag Vol/Hectare

2010 Study, Belgium

A high level of crown dieback was noted, and many of the ash trees were showing indications of ash dieback.

6.5 Other Scarce Woodland Birds Noted

Also present were Goshawk and Crossbill.

6.6 Site Summary

Site 6 was of interest due to the beech-dominated nature of the wider woodland area, which the LSW must be using. However few conclusions can be drawn about birds at this site, due to the few detections of LSW.

A follow-up visit was conducted later in the Spring, but nothing was found – as expected, given how little LSW spatial data was obtained during recorder analysis.



Figure 35: A part of the study site

Site 7, Avon (Possible LSW)

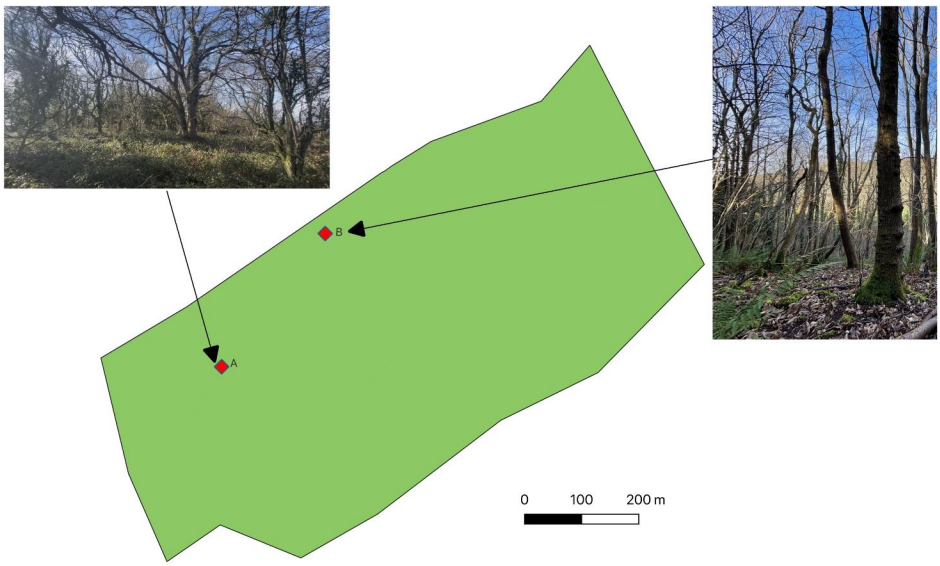


Figure 36: A map showing the study area at Site 7

Two possible vocalisations were detected at this site. Typical for an Avon woodland, composition was for the most part a mixture of ash and oak. The possible LSW vocalisations were detected in an area of sweet chestnut.

Recorder	LSW Calls	LSW Drums	GSW Vocs.
A	0	0	233 (4 days)
B	0	2 Poss (1 day)	103 (6 days)

Table 11: Vocalisations on each recorder

It is a historical Avon LSW site. If the two possible vocalisations (shown in *Fig 37*) are indeed drums, then the cadence and speed leaves little doubt over its identity as LSW. Nevertheless, a distant creaking tree cannot be ruled out; hence it is labelled here as a 'possible' LSW.

Goshawk was also noted calling at this site every morning during the deployment period – believed to be a new site for this locally rare resident.

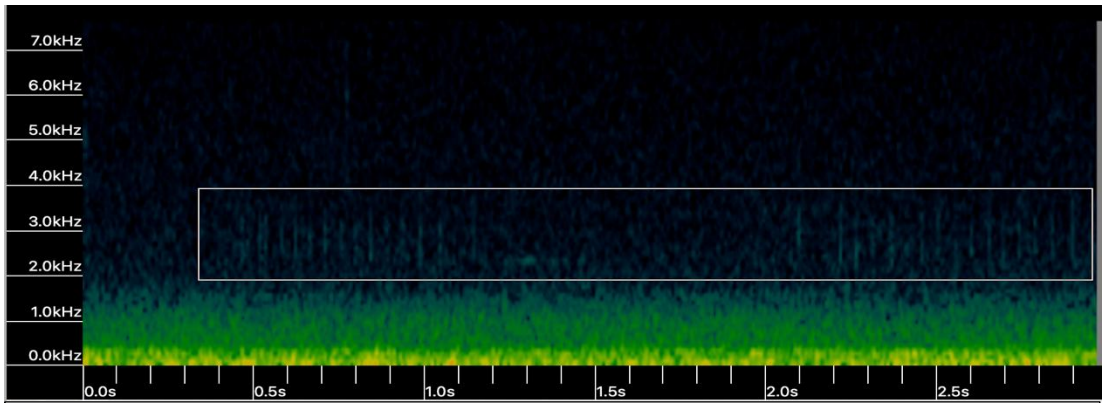


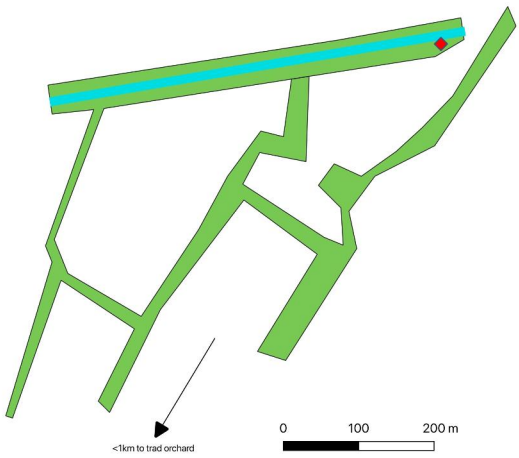
Figure 37: Lesser Spotted Woodpecker **drum**, Site 7, 20/02/2026. Recorder **B**

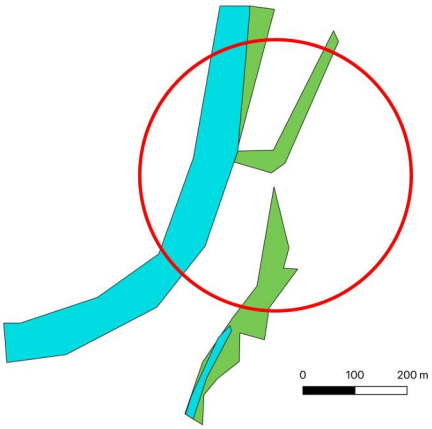
The following 5 sites were identified by birdwatchers and confirmed by the project.

Site 8, Gloucestershire

One bird (a male) was located at this site and observed over the course of a month, from Mid-April to Mid-May. It excavated a cavity, but it was not used.

This site was predominantly a marsh, and the bird was most frequently observed in riparian willow trees (shown as red marker on map). The area was a part of a much larger riparian system, with oak, alder and willow dominant in different adjoining areas. It was noted that a medium-size traditional orchard was within a kilometre of the observation area. A female was never observed.



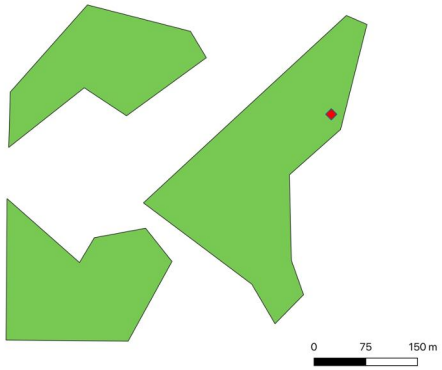


Site 9, Gloucestershire

A bird was heard at this site (within the red circle), which is considered likely to be the same the bird observed at Site 8 (which was nearby). The bird was only recorded on one date in February. Oak and Willow were the two dominant species.

Site 10, Gloucestershire

A bird was observed drumming at Site 10 (shown as the red marker on the map), in February by Arthur Ball. The site would be best described as parkland, although non-native trees made up a sizeable percentage composition of many of the woodland areas. Beech and oak were noted, though the woodland areas are intensively managed.

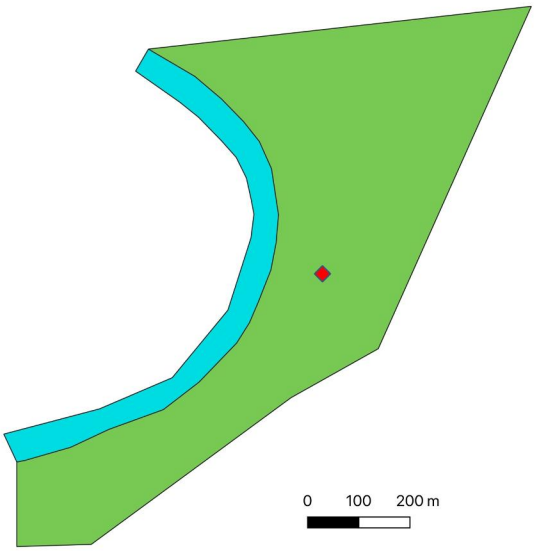


Site 11, Gloucestershire

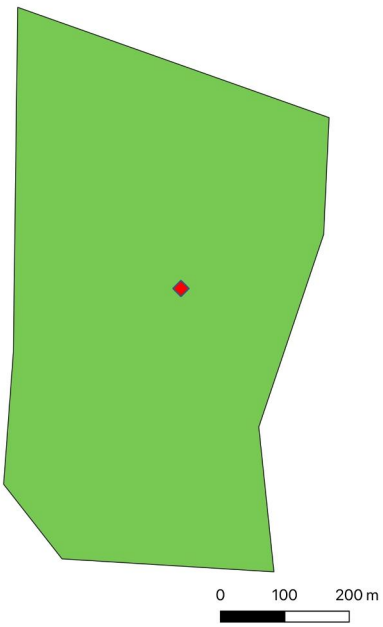
LSW were recorded drumming here on multiple days in April. The woodland was almost exclusively composed of beech, with a smaller ash component – and notably an absence of 'traditional' LSW tree species like oak and birch.

This site was also of interest due to its location within a 1990s LSW record hotspot. If a breeding pair of LSW exist here, it suggests that many other historical sites nearby (none of which were monitored as part of the project, due to the lack of recent records) may still be occupied.

Many other areas of near-identical woodland habitat to Site 11 exist nearby.



Site 12, Gloucestershire



This site was within 2km of one of the main study sites. It was within an oak-dominated area of woodland, with a small beech component. Note the lack of watercourses within the woodland. At least one LSW was recorded drumming throughout Spring.

Evidence of Recent Occupation

When deploying recorders at each site, some evidence of recent site occupation (old nest cavities) was also found. Whilst it cannot be ascertained for certain that these cavities had a chamber (and were thus not made by GSW), extremely likely LSW candidates were noted.

Site 13, Gloucestershire

No LSW were detected on recorders at this site. The landowner of this site was a regenerative farm. After the project first contacted them, an email was received from their ecologist, who said that he had recently observed a LSW at the site. It is very possible that – despite the significant resource that was put into the monitoring of this site – birds went undetected/recorders were placed in the wrong area of this site.



Figure 38: The cavity at Site 13



Figure 39: A map showing the study area at Site 7 (the cavity is shown in blue)



Figure 40: The location of the cavity at Site 13

Site 5 Recap: The Cavity at this Study Site



Figure 41: The cavity at Site 5

This nest cavity was excavated between the 4th and 11th April at **Site 5**. It was checked later in the season with the project thermal imager (see *Fig 42*) and shown to emit no heat signal – hence it was determined unoccupied. The older cavity above it had been previously located by Stuart Keenor from the South Wales project, and is thought to possibly have been excavated in 2025.

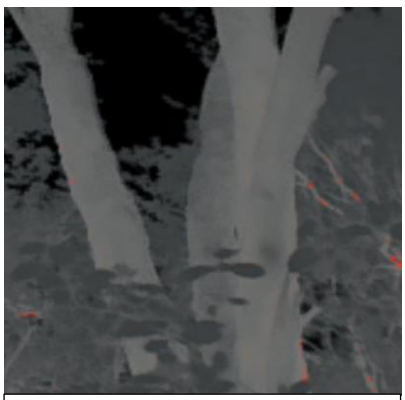


Figure 42: Checking the cavity with the thermal

A pair very likely bred at this site, although the nest site was not located. Project surveys picked up calling birds during the nesting season on the **13th May** and **23rd May**.

Site 14, Gloucestershire

This nest cavity was located during an initial site visit. It was merely 1.8 meters from the ground, allowing easy measuring of the cavity diameter – which was textbook LSW (~31mm). This nest cavity was thought to be relatively old.

No birds were recorded at this site, although recorders were not placed in the immediate vicinity of the cavity.



Figure 43: The cavity at Site 14

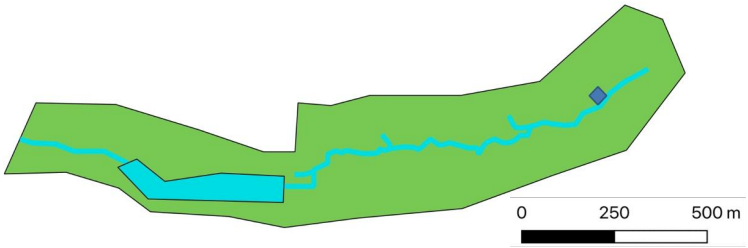


Figure 44: A map showing the study area at Site 14 (the cavity is shown in blue)

Climate-Vocalisation Data

As described in the Methodology, Humidity and Temperature data was monitored at eight sites, along with vocalisation time data. The results from one monitoring location (Site 5) are shown below because LSW were found to be extremely vocal there.

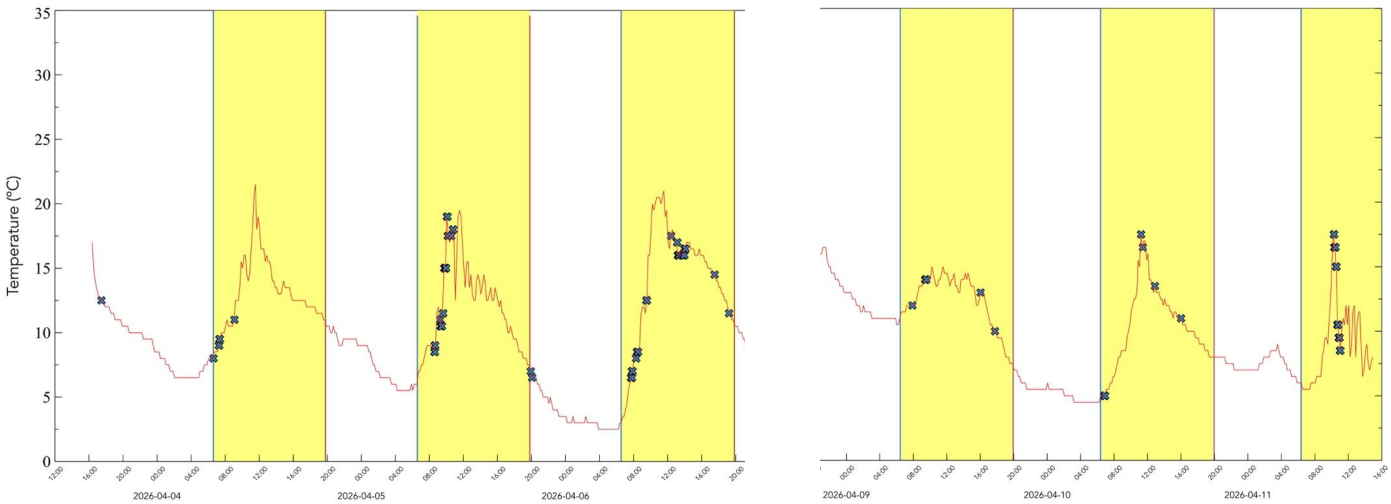


Figure 45: Temperature-Vocalisation graph for the first and last three days of deployment. Each blue cross represents a LSW drum/call, with the yellow box showing daylight hours.

Conclusions

The project identified populations of lesser spotted woodpecker across the project area. The approach taken, utilising Passive Acoustic Monitoring (PAM) in combination with an analysis of recent records, was extremely effective in confirming LSW presence at sites without records from the past few years.

Cotswolds

The results of the monitoring further added evidence to the project hypothesis that the Cotswolds hold a regionally significant population of LSW. Contrary to historical assumption, birds detected at the study sites in this region were generally in highly beech-dominated woodland, utilising small areas of companion species such as alder and birch to forage. The region's extensive network of brooks and streams – which are often adjacent to the characteristic Cotswold beech-woods – create riparian conditions for wet woodland tree species, which in turn provide an invertebrate-rich foraging site for LSW. Whilst in most cases, the region of each study site cannot be revealed, Site 6 – which was in the Cotswolds – is considered an excellent example of this.

Cotswold LSW territories are difficult to understand, and it is thought that this may be the reason for the historic under-recording in the region.

It is believed the evidence gathered on the Cotswolds as part of the project demonstrates that LSW inhabit areas of a very common, interconnected and extensive habitat type in the region: W12 and W14 woodland. Therefore it is believed that the project has gathered evidence to prove the basis for a systematic, volunteer-led LSW survey of the Cotswolds in a future year. It is predicted that such a survey could yield a number of confirmed LSW sites well into double digits.

Avon

Birds were found to be present at a site in Avon, marking the first territorial (multiple-day) record in the county since 2012. This is a huge success of the project.

It is still the belief of the project that Avon holds very few LSW, but the discovery of an active LSW site is promising. It is proposed that the large extent of ash-dominated woodland in Avon may potentially become more valuable as a resource for LSW as ash dieback progresses, though the effect of the disease on LSW is still being researched.

Whilst not the target species, a goshawk territory was also located (only the second for Avon).

Forest of Dean

Whilst monitoring showed that LSW appear to now be largely absent from the historic 'core' zones of the Forest of Dean, the Forest of Dean fringes appear to be supporting the species in considerable numbers. From our data, we conclude that this region likely has the highest population density in Gloucestershire. Whilst our project only detected LSW at a small number of Forest of Dean

sites (three), it is firmly believed that if more resource had been put into this region we could have found many more territories.

This would match with the findings of the Herefordshire LSW project, which found the Forest of Dean fringes to be an important county stronghold for LSW. Similarly to the Cotswolds, it would appear that the invertebrate abundance brought about by small pockets of riparian wet woodland compensates for the wider region's beech dominance. Observations have also indicated that ash dieback in the region is actively supporting the species.

Severn Vale

Understanding the true status of LSW in the Severn Vale is difficult, due to the extent of private and inaccessible land in this region. Riparian corridors linking directly to documented LSW strongholds like the Forest of Dean and South Herefordshire make it difficult to distinguish between dispersing birds and true resident birds.

Whilst the project studied birds at three sites in the region, the Severn Vale is the region where the status of LSW is felt to be the least understood. Despite having the highest density of traditional orchard in Gloucestershire, most of these are on private farms (of which several such sites were monitored). The project certainly showed that birds are still present in the wider area. It is felt that a dedicated survey of all these sites would be beneficial, on the basis of what has been found.

Overall

The project confirms that a scattered population of LSW exists across the project area. The approach taken, utilising PAM, was effective in confirming LSW presence at sites without records from the past few years. Notably, several of these sites (like Site 6) had benefitted from some observer effort specifically aimed at LSW, which had not detected the species.

Of the 25 sites monitored, 7 sites were confirmed (including one 'possible' site) using this method, and a further 2 sites were found with evidence of recent occupation. Records were also gathered from individual recorders of birds at a further 5 sites, representing a total of 14 confirmed LSW sites.

The site-selection process, utilising recent records, was effective at identifying sites for recorder deployment. Compared to the approach being taken in areas with high population densities of LSW, where all sites with suitable habitat are monitored, we propose that this selection process may improve efficiency in regions with a much lower population density of the species.

As part of the project, we found that birds in the project regions frequently utilise habitat types that have been historically undervalued as important for LSW. Fundamentally, in Gloucestershire, unlike large, well-studied populations in Sussex, Kent and Hampshire (where foraging, nesting and drumming habitats overlap) we find that these three needs are often met in separate areas. This enables LSW to colonise sites that would traditionally have been considered unsuitable for this 'specialist generalist'.

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