

Birchenwood, Brindsey Lane, Staunton

Bat Activity (Static & Transect) and Emergence/Re-entry Surveys

On behalf of Michael Bryant

Project Ref: BB2023002Bv1

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1 Introduction

1.1 Scope

1.1.1 Wild Service was commissioned by Michael Bryant to undertake bat emergence/re-entry surveys of the main house, and bat activity surveys of the surrounding habitat at Birchenwood, Brindsey Lane, Staunton, Gloucestershire, GL16 8PE (hereafter referred to as 'the Site'). The surveys are to inform plans to renovate and erect an extension onto the existing house. The bat surveys comprised of:

- Three bat dusk emergence/entry surveys on the existing house;
- Deployment of static bat detectors (June - August); and
- Three bat transect activity surveys (June - August).

1.1.2 The previous ecological report concluded that the main house had high potential to support roosting bats and potential disturbance on hedgerows (from lighting) could impact bats (lesser horseshoe *Rhinolophus hipposideros* and greater horseshoe *R. ferrumequinum*) associated with the Wye Valley & Forest of Dean Special Area of Conservation (SAC). For further details refer to the Preliminary Ecological Appraisal (PEA) report produced by Wild Service, March 2023.

1.1.3 This report presents the findings of the above surveys and identifies ecological constraints and opportunities. It also proposes a series of pragmatic and proportional mitigation and enhancement measures.

1.2 Site Description

1.2.1 The Site is located to the south of Staunton, Gloucestershire, within an existing residential plot surrounded by woodland and farmland. The Site contains buildings (the main house, a small brick shed and a double garage), hardstanding (consisting of a driveway), a boundary hedgerow, scattered trees, orchard, and amenity grassland. A Site Location Plan is provided in Figure 1.

1.2.2 The surrounding landscape contained predominantly woodland, parkland and pastoral fields.

1.2.3 The central Ordnance Survey Grid Reference for the Site is SO 54219 11702.

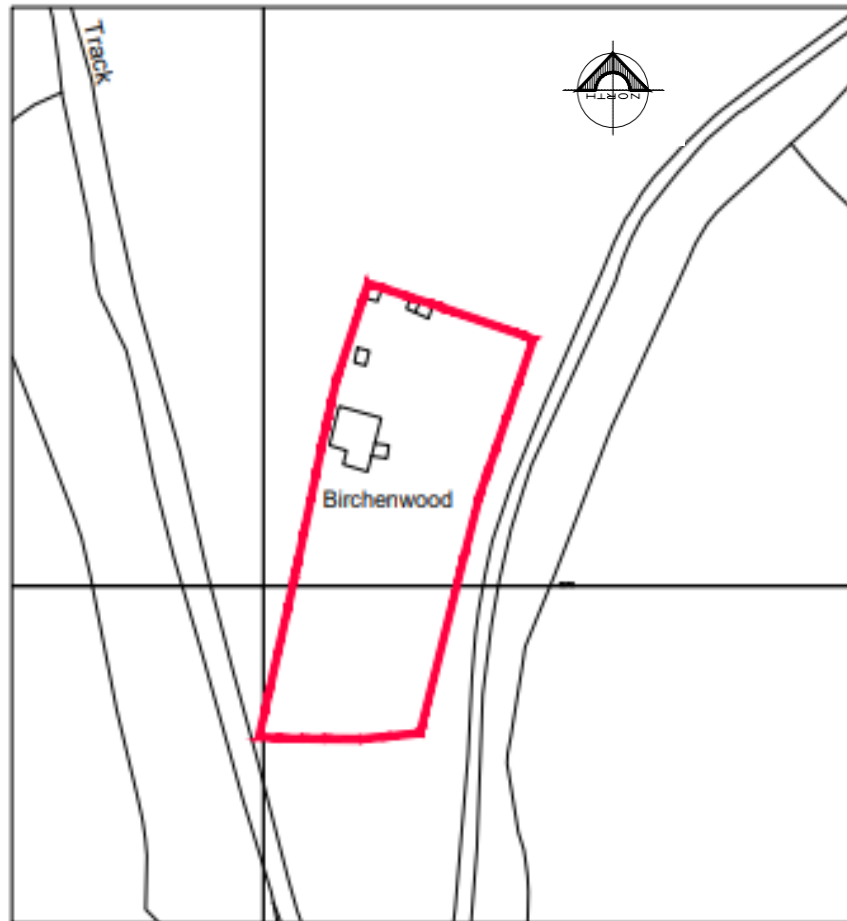


Figure 1. Site location plan (plan provided by client)

1.3 Background Information

1.3.1 A Preliminary Ecological Appraisal (PEA), which included a Preliminary Roost Assessment (PRA) was undertaken in February 2023 (Wild Service, 2023). The PEA report should be consulted for initial habitat and species considerations and for full PRA survey results. A summary of the PRA results is provided below.

Roosting Bats

1.3.2 During the PRA undertaken in February 2023, bat droppings and potential feeding remains were found in the main house (also referred to as building 'B1'). Potential roosting features were also identified externally, with limited roosting options noted internally. B1 was therefore assessed as having **high potential to support roosting bats**. In accordance with Bat Conservation Trust (BCT) guidelines (Collins, 2016) and given the presence of bat droppings and likely feeding remains recorded internally, a total of three bat emergence surveys (including use of night vision equipment) were

recommended for B1, to determine the current presence/likely absence of the roost and to characterise the roost (if found to be present during surveys).

- 1.3.3 The small brick shed, and double garage were assessed as having negligible potential to support roosting bats, and there are no proposed works to these buildings. As such, no further bat surveys were recommended for these buildings.

Commuting/Foraging Bats

- 1.3.4 The PEA report included a desk study which identified that the Site lies within “Zone A” of the Wye Valley and Forest of Dean Bat SAC. As outlined in the Horseshoe Bat Activity Survey and Assessment Guidance guidelines (Forest of Dean District Council, 2021), the Site is within an area identified as important for lesser horseshoe bats. As such, works within this area could potentially affect mobile elements (in this case bats) from the SAC. The relevant desk study results of the PEA (designated sites and bat records) are provided in Section 3 of this report for reference.
- 1.3.5 Although proposed works are limited to the existing building only, the Site contained a hedgerow which could be impacted by lighting, and the habitats surrounding the site (woodland and grassland) provided commuting/foraging habitat for bats. Due to the potential impacts from lighting on nearby hedgerows and trees from the proposals, bat activity surveys (transect and static detector) were recommended to assess the potential impact of the proposed development on bats associated with the Wye Valley and Forest of Dean Bat SAC.

1.4 Legislation

- 1.4.1 This report has been prepared in accordance with relevant legislation and policy. Further detail is provided in Appendix 1, however the following primary documents are of relevance:

- The Wildlife and Countryside Act 1981 (as amended) (WCA 1981);
- The Countryside and Rights of Way Act (CROW Act), 2000 (as amended);
- The Natural Environment and Rural Communities Act (NERC Act), 2006; and
- The Conservation of Habitats and Species Regulations 2017 (as amended) (CHS 2017).

1.4.2 No part of this report should be considered as legal advice and when dealing with individual cases, the client is advised to consult the full texts of the relevant legislation and obtain further legal advice.

2 Methods

2.1 Desk Study

2.1.1 A desk study was undertaken in February 2023 to support the PEA report and full desk study results are analysed within the PEA report (Wild Service, 2023). These desk study results have been consulted again to support this bat survey report, and include consideration of the following:

- Statutory and non-statutory nature conservation sites within 1km of the Site (including an extended 5km search of Ramsar sites, Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)); and
- Records of bats within 2km of the Site.

2.1.2 Ecological data were provided by Gloucestershire Centre for Environmental Records (GCER) in February 2023 and have been sourced from the Multi-Agency Geographic Information for the Countryside (MAGIC) website (2023).

2.2 Dusk Emergence Surveys

2.2.1 Three dusk emergence surveys were undertaken on the main building (B1) on 29th June 2023, 18th July 2023, and 1st August 2023.

2.2.2 The survey team comprised of Julia Morrison (accredited agent under Elizabeth Pimley's Natural England licence number 2015-13418-CLS-CLS, WML CL18 (Bat survey level 2), Gemma Waters (NE Bat Survey Level 2: 2015-15620-CLS-CLS), Harriet Robins and Ljiljana Vujakovic.

2.2.3 Surveyors were positioned around the building so that potential roosting features could be viewed. The dusk emergence surveys began 15 minutes prior to sunset and ended approximately 90 minutes after sunset (see Figure 2 for surveyor positions).

2.2.4 Echo Meter Touch 2 Pro bat detectors were used to carry out the survey and identify the species present. Each surveyor was equipped with a radio to facilitate communication between surveyors as to bat emergence/re-entry behaviour.

2.2.5 Night vision aids (including Sony Handycam FDR-AX53 with infrared illuminator) were used to assist viewing bat emergences at low light levels.

- 2.2.6 Where possible the bat surveyor used a red light to inspect the interior of the building for any bats at intervals during the survey to gain a more detailed understanding of where bats are roosting/feeding.
- 2.2.7 Each surveyor is trained and has prior experience in carrying out dusk emergence/dawn re-entry surveys and the use of bat detectors.

2.3 DNA Analysis

- 2.3.1 A sample of fresh and old bat droppings were collected during the PEA survey in February 2023 from two locations in the main house i.e. the second floor and the ground floor. The droppings from the second floor were taken from a pile of approximately 50 bat droppings found on top of insulation boards, comprising a mix of fresh and old droppings. The sample from the ground floor was taken from approximately five bat droppings found on wooden boards near the staircase (several butterfly wings were also recorded in this location). The location of droppings is provided in Figure 2. The two samples were sent to the University of Warwick for DNA analysis to confirm the species present.

2.4 Bat Activity Surveys

- 2.4.1 Three separate bat activity surveys (transect and static detector surveys) were undertaken on the Site, one per month between June and August 2023. Static detectors were left on Site for five consecutive nights on each occasion.

Transect Surveys

- 2.4.2 The survey team comprised Becca Brown (Natural England Licence no. 2020-45262-CLS-CLS , Bat survey level 1), Julia Morrison and Harriet Robins. Two surveyors were present on each survey.
- 2.4.3 Echo Meter Touch 2 Pro detectors, set to time expansion mode, were used to carry out the surveys.
- 2.4.4 In line with Collins guidelines (2016), dusk activity surveys began at sunset, and the duration of the survey lasted between 120 – 180 minutes.
- 2.4.5 Transect surveys consisted of undertaking a walked transect across a pre-determined route on Site, carefully selected to encompass areas of habitat suitable for bats

primarily linear features, foraging areas and potential roost sites (see Figure 2 for transect route). Due to the small size of the Site, one route was walked on each transect survey. The primary objective of the transects was to identify foraging areas, commuting routes, and species utilisation of the Site. Surveyors walked a defined route at a measured pace and record bat passes, species present, location, and bat activity/behaviour type. The results were mapped using QGIS and the information gathered shows areas of frequent bat usage in terms of abundance and diversity of species.

Static Survey

- 2.4.6 Static acoustic monitoring was undertaken at a single location within the Site on each survey where impacts were predicted to be highest, (see Figure 2 for static location). Static Anabat Express and Anabat Chorus detectors were deployed on three separate occasions from June to August 2023 and on each occasion, detectors were left on Site for five consecutive nights.
- 2.4.7 Detectors were programmed to activate 30 minutes before dusk and recorded continuously until 30 minutes after sunrise. This allowed continuous monitoring to take place during the period when bats are active. Omni-directional microphones were used, and efforts were made to ensure that microphones were pointing over open space and not blocked by vegetation. Measures were also taken to ensure that microphones would not be impacted by rustling leaves, and that microphones pointed towards the likely commuting routes and foraging areas of bats.
- 2.4.8 Echolocation calls were analysed manually in Analook insight software and sound analysis, and species identification were undertaken using Russ (2012). For the purpose of the analysis a bat 'pass' is defined as a single, uninterrupted sequence of echolocation calls lasting a maximum of 15 seconds. Only call sequences of three or more pulses were identified and labelled. Sound files of anything other than identifiable bats were omitted from further analyses.

2.5 Limitations and Constraints

- 2.5.1 While every attempt has been made to collect accurate baseline data, all ecological surveys represent a 'snapshot' of activity. Ecological features are dynamic and often

transient, and it is not possible to confirm the absence of a species through survey. It may be necessary to update the ecological surveys if sufficient time elapses since the surveys and data collection presented in this report were carried out.

- 2.5.2 Due to the limited nature of the proposed works and consequently limited impact on local bats, a pragmatic approach to activity surveys was undertaken, with three activity transect surveys undertaken over the summer, and deployment of one static detector for five nights on each survey visit. We consider that sufficient data on bat usage of the Site has been collected.
- 2.5.3 The static detector did not record for five full nights during July due to a fault of the detector. Therefore, the static detector was deployed for a total of eight nights in August and an additional night's data in June was included in the analysis. Therefore, 15 nights of static data was collected in total. Furthermore, as transect surveys and dusk emergence surveys (in which commuting and foraging bats were also recorded) were undertaken throughout these months, we consider that sufficient data on bat usage of the Site has been collected.



Figure 2. Bat activity transect route (including listening points), static detector location, surveyor positions and bat dropping locations at Birchenwood, Brindsey Lane

3 Results

3.1 Desk Study

3.1.1 There are several Special Areas of Conservation (SAC) within 5km of the Site, as listed below:

- Wye Valley & Forest of Dean Bat Sites (SAC), approx. 4.4km from the Site;
- Wye Valley Woodland (SAC), approx. 2.8km from the Site; and
- River Wye SAC, approx. 1.7km from the Site.

3.1.2 The Wye Valley & Forest of Dean Bat Sites SAC is a complex of sites on the border between England and Wales containing the greatest concentration of lesser horseshoe bats in the UK, and the site also contains approximately 6% of the UK population of greater horseshoe bats (JNCC, 2021).¹ Lesser horseshoe bats are also listed as a 'qualifying feature, but not a primary reason for site selection' in relation to the Wye Valley Woodland SAC, which is designated primarily for beech forest habitat, forest slopes, screes and ravines, and yew woodland. The River Wye SAC is designated primarily due to the watercourse and associated features, with several species forming the primary reason for site selection (all strictly aquatic species except for otters).

3.1.3 There were 33 records of bats within 2km of the Site. Species comprised of greater horseshoe, lesser horseshoe, western barbastelle *Barbastella barbastellus*, serotine *Eptesicus serotinus*, *Myotis* species, Leisler's *Nyctalus leisleri*, noctule *Nyctalus noctula*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus* and brown long-eared *Plecotus auritus*. None of the records returned from the GCER data search were specific to the Site.

3.2 Dusk Emergence Surveys

3.2.1 Survey weather data is recorded in Table 1 and bat emergence locations/flight directions are provided in Figure 3. Full results of the dusk emergence surveys are outlined in Table 3.1., 3.2. and 3.3., and the key results are summarised below.

¹ <https://sac.jncc.gov.uk/site/UK0014794>

- 3.2.2 A **single common pipistrelle bat was seen to emerge** from the south/south-west gable of the house during the first dusk emergence survey.
- 3.2.3 A total of **three common pipistrelle and a single *Myotis daubentonii*² emerged** from the southern gable end under the white soffit during the second dusk emergence survey.
- 3.2.4 A total of **three soprano pipistrelle bats emerged** from the southern gable end of the building during the third dusk emergence survey.

3.3 DNA Analysis

- 3.3.1 The DNA analysis results confirmed the droppings collected from main house in February 2023 were common pipistrelle bat droppings (full results provided in Appendix 3).

² Species identified from analysis of sonogram as no droppings from this species were found

Table 1. Survey Conditions During Bat Emergence Surveys

| Survey date | Sunset time | Start/end of Survey | Temperature °C | Wind (beaufort scale) | Rain |
|-------------|-------------|---------------------|----------------|-----------------------|--|
| 29/06/2023 | 21:32 | Start 21:17 | 16 | 0 | None |
| | | End 22:52 | 14 | 0 | None |
| 18/07/2023 | 21:20 | Start 20:55 | 16 | 0 | Light drizzle for first 10 mins of survey, then dry. |
| | | End 22:51 | 14 | 0 | None |
| 01/08/2023 | 20:58 | Start 20:43 | 16 | 0 | Light drizzle at start of survey, then dry. |
| | | End 22:28 | 15 | 0 | None |

Table 2. Survey Conditions During Bat Transect Surveys

| Survey date | Sunset time | Start/end of survey | Temperature (°c) | Wind (beaufort scale) | Rain |
|-------------|-------------|---------------------|------------------|-----------------------|--|
| 29/06/2023 | 21:32 | Start 21:32 | 16 | 0 | None |
| | | End 23:52 | 14 | 0 | None |
| 18/07/2023 | 21:20 | Start 21:20 | 16 | 0 | Light drizzle for first 10 mins of survey, then dry. |
| | | End 23:58 | 14 | 0 | None |
| 01/08/2023 | 20:58 | Start 20:58 | 16 | 0 | Light drizzle at start of survey, then dry. |
| | | End 23:55 | 15 | 0 | None |

Table 3.1. Dusk Emergence Survey of Main House (B1) 29th June 2023. Sunset: 21:32

| Activity | | Details | | | |
|----------|--------------------|----------------------------------|-------------|--------------|---|
| Time | Details | Species | No. of bats | Surveyor No. | Location/Behaviour |
| 21:50 | Emergence | <i>Pipistrellus pipistrellus</i> | 1 | 1 | Emerged from south/south-west elevation roof of main house. |
| 22:05 | Commuting | <i>Eptesicus serotinus</i> | 1 | 1 | Flew west to east across the Site |
| 22:13 | Commuting | <i>Plecotus auritus</i> | 1 | 1 | Flew north to south over Site. |
| 22:14 | Foraging | Unidentified | 1 | 2 | One bat seen flying over building, and then over the south elevation. |
| 22:30 | Pass | <i>Myotis</i> species | 1 | 1 | Echolocation call detected. Bat not seen. |
| 22:31 | Commuting | <i>Myotis</i> sp. | 1 | 2 | Flew west to east across the Site |
| 22:34 | Commuting | <i>Rhinolophus ferrumequinum</i> | 1 | 2 | Flew east to west across the Site |
| 22:42 | Foraging | <i>Myotis</i> sp. | 1 | 1 | Flew in loops over main house roof several times, possibly foraging. |
| 22:51 | Pass | <i>P. auritus</i> | 1 | 1 | Echolocation call detected. Bat not seen. |
| 22:52 | Survey terminated. | | | | |

Table 3.2. Dusk Emergence Survey Results of Main House (B1) 18th July 2023 – Sunset 21:20

| Activity | | Details | | | |
|----------|-----------|---------------------------|-------------|--------------|--|
| Time | Details | Species | No. of bats | Surveyor No. | Location/Behaviour |
| 21:08 | Emergence | <i>P. pipistrellus</i> | 1 | 1 | One bat emerged from the south gable roof, between the wall top and wooden fascia. |
| 21:27 | Emergence | <i>P. pipistrellus</i> | 1 | 1 | One bat emerged from the south gable roof, between the wall top and wooden fascia. |
| 21:37 | Emergence | <i>P. pipistrellus</i> | 1 | 1 | One bat emerged from the south gable roof, between the wall top and wooden fascia. |
| 21:38 | Pass | <i>Myotis</i> sp. | 1 | 2 | Echolocation call detected. Bat not seen. |
| 21:45 | Pass | <i>Myotis</i> sp. | 1 | 2 | Echolocation call detected. Bat not seen. |
| 21:46 | Emergence | <i>Myotis daubentonii</i> | 1 | 1 | One bat emerged from the south-west corner of the roof. |
| 21:48 | Foraging | Unidentified | 1 | 1 | One bat foraging in garden to east of house. Possible <i>Pipistrellus</i> sp. But no echolocation call detected. |
| 21:50 | Pass | <i>Nyctalus leisleri</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 21:50 | Commuting | <i>E. serotinus</i> | 1 | 1 | Flew west to east over Site. |
| 21:51 | Pass | <i>P. pygmaeus</i> | 1 | 1 | Echolocation call detected. Bat not seen. |
| 21:52 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 21:52 | Pass | <i>P. pipistrellus</i> | 1 | 1 | Echolocation call detected. Bat not seen. |
| 21:53 | Pass | <i>P. pygmaeus</i> | 1 | 1 | Echolocation call detected. Bat not seen. |
| 21:57 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 21:57 | Commuting | <i>P. pipistrellus</i> | 1 | 1 | Flew west to east over Site. |
| 21:58 | Commuting | <i>Myotis</i> sp. | 1 | 1 | Flew west to east over Site. |
| 22:00 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:00 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:00 | Commuting | <i>P. pipistrellus</i> | 1 | 1 | Flew west to east over Site. |

| | | | | | |
|-------------|--------------------|-------------------------|---|---|---|
| 22:02 | Pass | <i>Nyctalus noctula</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:06 | Pass | <i>Myotis</i> sp. | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:06 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:06 | Pass | <i>P. pipistrellus</i> | 1 | 1 | Echolocation call detected. Bat not seen. |
| 22:09 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:09 | Pass | <i>P. pipistrellus</i> | 1 | 1 | Echolocation call detected. Bat not seen. |
| 22:09 | Pass | <i>P. auritus</i> | 1 | 1 | Echolocation call detected. Bat not seen. |
| 22:11 | Pass | <i>Myotis</i> sp. | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:13 | Pass | <i>N. noctula</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:13 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:15 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:21 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:23 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:36 | Pass | <i>P. pygmaeus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:37 | Pass | <i>N. noctula</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:41 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:41-22:43 | Pass | <i>P. pipistrellus</i> | 1 | 1 | Echolocation call detected. Bat not seen. |
| 22:42 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:43 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:45 | Pass | <i>P. pygmaeus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:50 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:50 | Survey terminated. | | | | |

Table 3.3. Dusk Emergence Survey Results of Main House (B1) 1st August 2023 – Sunset 20:58

| Activity | | Details | | | |
|---------------|--------------------|------------------------|-------------|--------------|--|
| Time | Details | Species | No. of bats | Surveyor No. | Location/Behaviour |
| 20:54 | Emergence | <i>P. pygmaeus</i> | 1 | 1 | One bat emerged from the south gable roof, between the wall top and wooden fascia. |
| 21:06 | Commuting | <i>P. pygmaeus</i> | 1 | 1 | Flew north to south over Site. |
| 21:09 | Commuting | <i>P. pipistrellus</i> | 1 | 2 | Flew north-east to west over Site. |
| 21:09 | Emergence | <i>P. pygmaeus</i> | 2 | 1 | Two bats emerged from the south gable roof, between the wall top and wooden fascia. |
| 21:19 | Commuting | <i>Myotis</i> sp. | 1 | 1 | Flew west to east across Site. |
| 21:23 | Possible emergence | Unidentified | 1 | 2 | Flew over roof of building toward woodland to the west. No echolocation call detected. |
| 21:24 | Commuting | <i>P. pipistrellus</i> | 1 | 2 | Flew east to west over Site. |
| 21:33 | Pass | <i>P. pipistrellus</i> | 1 | 1 | Echolocation call detected. Bat not seen. |
| 21:42 | Pass | <i>P. pipistrellus</i> | 1 | 1 | Echolocation call detected. Bat not seen. |
| 21:43 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 21:48 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 21:49 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 21:59 | Commuting | <i>P. pipistrellus</i> | 1 | 2 | Flew west to east, past north elevation of house. |
| 22:05 | Commuting | <i>P. pygmaeus</i> | 1 | 2 | Flew east to west over Site. |
| 22:17 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:22 - 22:23 | Pass | <i>P. pipistrellus</i> | 1 | 1 | Echolocation call detected. Bat not seen. |
| 22:25 | Pass | <i>P. pipistrellus</i> | 1 | 2 | Echolocation call detected. Bat not seen. |
| 22:28 | Survey terminated. | | | | |

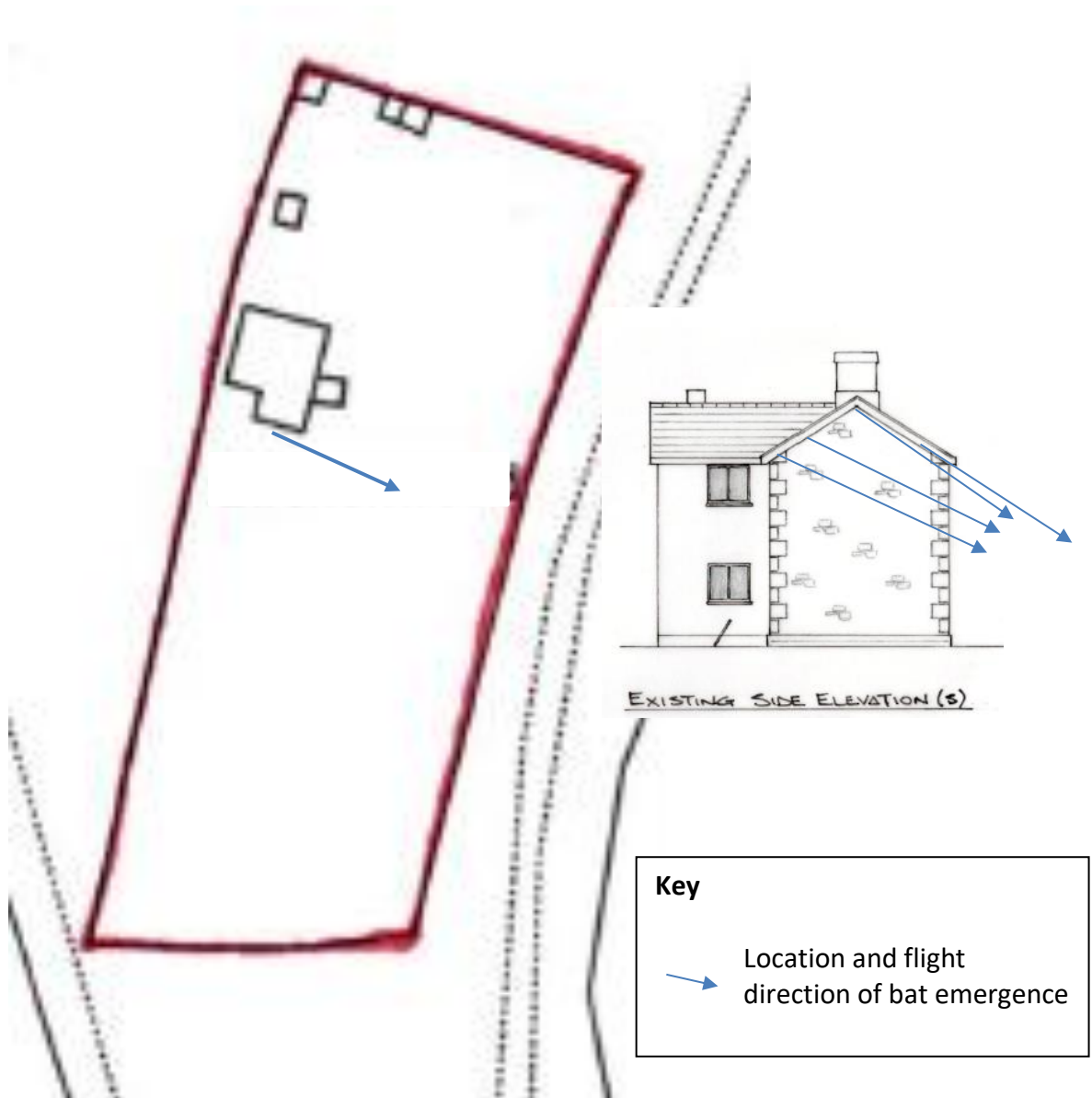


Figure 3. Site plan and elevation plan of Birchenwood, including locations and flight direction of bat emergences

3.4 Bat Activity Surveys

3.4.1 Survey weather data is recorded in Table 2. The results of the static and transect surveys are outlined in Table 4 and Figure 4 and are summarised below.

3.4.2 Survey results confirmed that soprano pipistrelle were the most frequently recorded species at Site, followed by *Myotis* species and common pipistrelles. All hedgerows were used by bats, though the western hedgerow was utilised the most and the eastern hedgerow the least. A total of 17 passes of lesser horseshoe bat were recorded during the static surveys, but none were picked up during the transect surveys. No greater horseshoe bats were recorded during the static surveys; however, a single greater horseshoe pass was picked up on a transect survey.

Table 4. Static Detector Survey Results (Total bat passes per month/species)

| Species | Month | | |
|-----------------------|-------|------|--------|
| | June | July | August |
| Common pipistrelle | 9 | 2 | 65 |
| Soprano pipistrelle | 15 | 3 | 225 |
| <i>Myotis</i> species | 25 | 5 | 64 |
| Lesser horseshoe | 0 | 0 | 17 |
| Barbastelle | 0 | 0 | 3 |
| Serotine | 1 | 0 | 2 |

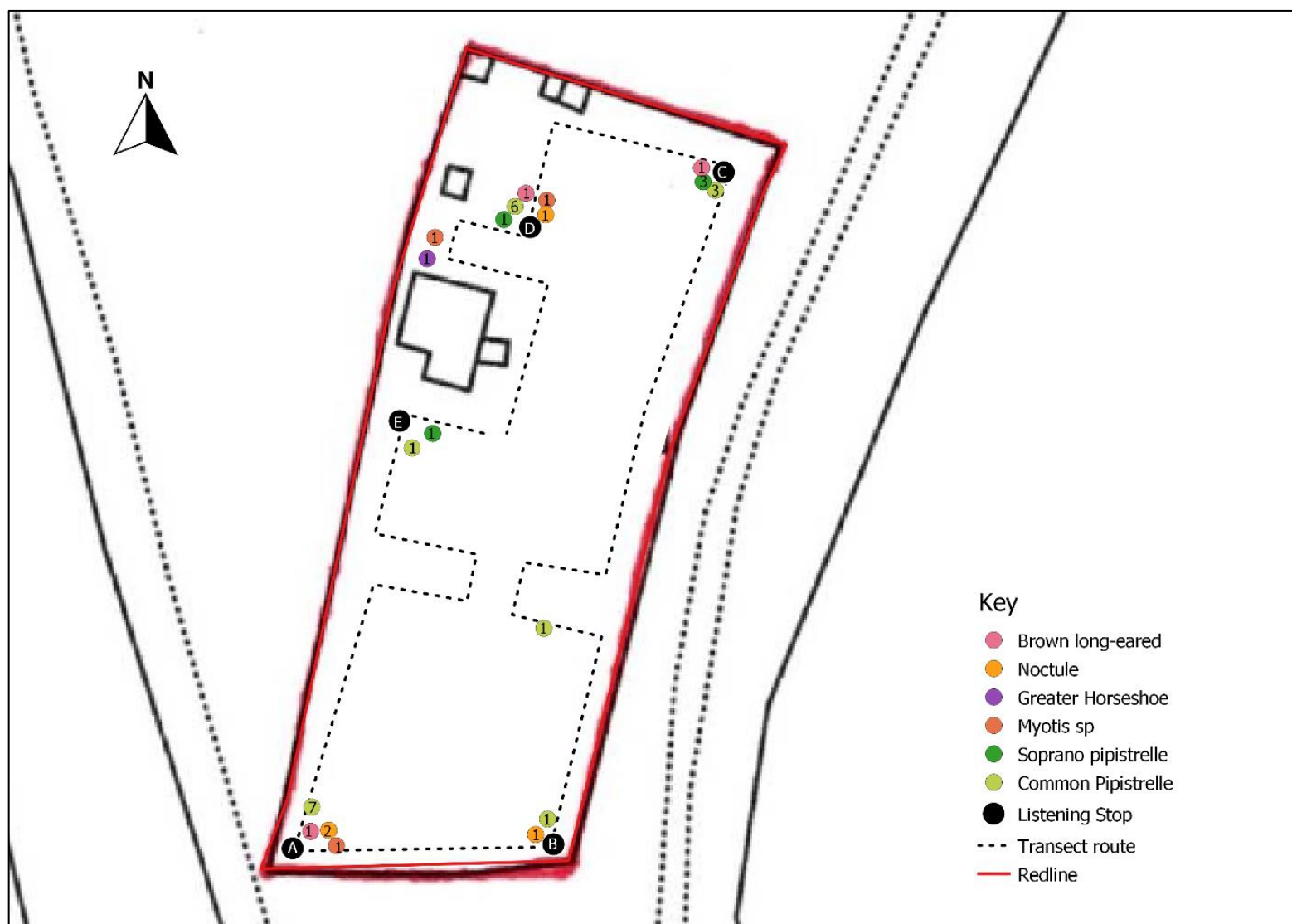


Figure 4. Map of bat transect survey results including species recorded, and number/location of passes.

4 Discussion and Recommendations

4.1 Discussion

- 4.1.1 Bats and their resting places are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017.

Activity Surveys

- 4.1.2 The boundary hedgerows are used by a variety of bat species for foraging and commuting as shown by the results of the bat activity surveys and static detector surveys, with the western hedgerow being used by the highest diversity of bat species and used most frequently (as evidenced by the highest number of bat passes). With regards to lesser horseshoe bat usage of the Site, only 17 passes were recorded along western hedgerow over eight nights (static detector survey data) and these passes only occurred in the month of August. The highest number of passes were recorded on night five and a total of five passes were recorded. No greater horseshoe bats were recorded on the static detector; however, a single greater horseshoe bat was recorded on the transect survey. Other bat species recorded during the transect surveys and static surveys included common and soprano pipistrelle, serotine, noctule, brown long-eared, barbastelle and *Myotis* species.

- 4.1.3 It is our understanding (and recommendation) that there is to be no additional external lighting installed as part of the proposals for the development and all the hedgerows and trees are to be retained, impacts on foraging and commuting bats, including horseshoe bats (low numbers recorded) associated with the Wye Valley & Forest of Dean are negligible. However, precautionary mitigation for lighting are outlined below, should plans change.

Roosting bats

- 4.1.4 The main house was found to provide day roosts for low numbers of common pipistrelle bats (maximum count of three), soprano pipistrelle bats (maximum count of three) and Daubenton's bat (maximum count of one). All bats were recorded emerging from the southern gable under the soffit (See photograph 2 in Appendix 2 for emergence locations). No roosting bats were recorded during daytime visits, but there are several

gaps within the walls and gaps within the roofing felt and tiles. The activity surveys recorded bats commuting along all the boundary hedgerows with the most activity along the western boundary. Given the numbers recorded (maximum count of four common pipistrelle and maximum count one *Myotis* species) the roosts in the house have been ruled out as a maternity roost for either species. Therefore, the roost is considered to be of low-moderate conservation importance.

- 4.1.5 DNA dropping were sent for analysis and confirmed to be common pipistrelle. No bats were seen inside the building and given the damp and drafty conditions inside the building it is considered likely that bats are roosting within the soffits, which could lead to gaps between tiles and roofing felt on the roof of the house that could provide additional roosting habitat. The bat survey results indicate that the south and south-west aspects of the roof (bats emerged from under the soffit) were the locations where the bats were roosting. There are multiple large holes leading into the main building and holes leading from the roof into the main building. It is therefore possible that bats could use the rest of the house for light sampling prior to emergence, although the interior of the house was not considered to offer ideal roosting conditions due to it being damp and drafty.
- 4.1.6 The proposed development seeks to renovate and add an extension to the main building. This will result in the damage and disturbance of the day roost. Current plans indicate that the roost can be retained within the proposals.

4.2 Recommendations

Mitigation

- 4.2.1 Due to the confirmed presence of common pipistrelles, soprano pipistrelle and Daubenton's bats roosting in the roof of the main house, a European Protected Species (EPS) licence will be required from Natural England before works can proceed. Details of the mitigation strategy must include plans for the compensation roosts showing the proposed bat roosting opportunities, timetabling of works and other necessary measures to avoid risks to bats. Compensatory roosting provision should be in the form of three bat boxes/bat tiles built on/into the building. Suitable bat boxes include Schwegler 1FF that can be fitted on the exterior wall and Schwegler IFR Integrated bat

box and Habibat Bat Box that are fitted into the wall. Bat tiles could also be installed on the roof of the building.

- 4.2.2 Should Natural England grant the EPS licence, it will be necessary to complete the work relating to the bat roost under the supervision of a bat licenced ecologist. Site works should take place outside the sensitive period for bats. Ideally works should take place between 1st September and 1st May. It should be noted that no works which could obstruct access to the potential roosting sites and/or damage/destroy these potential roosting sites should be undertaken prior to the licence being obtained.
- 4.2.3 Prior to works, it will be necessary to install bat boxes on retained tree/trees on land within the client's ownership/control to provide a receptor area to house any bats found before/during works to the roost. This could be in the form of three Schwegler 2FN bat boxes (one for each species) or if works undertaken during winter, then three insulating bat boxes should be used, such as the Timber hibernation boxes³. The bat boxes will need to be installed by the client on a tree or trees bordering the site at least 3m high, with ladder access provided. The tree, and its root protection zone, should be protected from disturbance during works using appropriate fencing. These bat boxes will remain in place to provide additional roosting habitat on site. Bat boxes should be installed to face in different directions and placed in areas where there is no illumination.
- 4.2.4 Prior to the start of any works, the licenced bat ecologist will inspect the interior of the building using an endoscope. Assuming no bats are found, then the works may proceed under the ecological supervision of the licenced ecologist. Should any bats be found during the initial search or during works, these will be removed by the licenced bat ecologist, checked to make sure they do not require veterinary attention and then placed in the compensation roost or the bat box.
- 4.2.5 It is our understanding that no external lighting is proposed. However, should this change it is recommended that any proposed lighting should be designed sensitively to minimise light spill and potential impacts on bats in accordance with best practice. The

³ <https://www.wildcare.co.uk/timber-hibernation-box.html>

following recommendations are based on Bats and artificial lighting at night Lighting in the UK (Institution of Lighting Professionals 2023):

- No lighting will be placed on to or directed onto boundary habitats;
- All luminaires should lack UV elements when manufactured. Metal halide, compact fluorescent sources should not be used;
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white light source (2700Kelvin or lower) should be adopted to reduce blue light component;
- Light sources should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats;
- Internal luminaires can be recessed (as opposed to using a pendant fitting) where installed in proximity to windows to reduce glare and light spill.
- Waymarking inground markers (low output with cowls or similar to minimise upward light spill) to delineate path edges.
- Column heights should be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards.
- Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered.
- Luminaires should always be mounted horizontally, with no light output above 90° and/or no upward tilt.
- Where appropriate, external security lighting should be set on motion sensors and set to as short a possible a timer as the risk assessment will allow. For most general residential purposes, a 1 or 2 minute timer is likely to be appropriate.
- The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to a considerable range of issues, such as unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased upward light scatter from surfaces and poor facial recognition which makes them

unsuitable for most sites. Therefore, they should only be considered in specific cases where the lighting professional and project manager are able to resolve these issues.

- Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely.

Enhancements

- 4.2.6 To further improve the foraging resource within the site wildlife planting to benefit bats is recommended. This is intended to increase the abundance of nocturnal invertebrate prey for bats by planting night-scented species shown in Appendix 5.

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Appendix 1 – Policy & Legal Considerations

Statutory nature conservation sites and protected species are a ‘material consideration’ in the UK planning process (DCLG, March 2012). Where planning permission is not required, for example on proposals for external repair to structures, consideration of protected species remains necessary given their protection under UK law.

The **Conservation of Habitats and Species Regulations 2017** transpose the requirements of European Directives such as the Habitats Directive and Birds Directive⁴ into UK law, enabling the designation of protected sites and species at a European level.

The **Wildlife and Countryside Act 1981** (as amended) forms the key piece of UK legislation relating to the protection of habitats and species. The **Countryside and Rights of Way Act 2000** provides additional support to the 1981 Act, for example, increasing the protection of certain reptile species. Specific protection for badger is provided by the **Protection of Badger Act 1992**. The **Wild Mammals (Protection) Act 1996** sets out the welfare framework with respect to wild mammals prohibiting a range of activities which may cause unnecessary suffering.

The Government has a duty to ensure that parties take reasonable practicable steps to further the conservation of habitats and species of Principal Importance for Conservation in England listed under Section 41 of the **Natural Environment and Rural Communities Bill 2006**⁵. In addition, the 2006 Act places a Biodiversity Duty on public authorities who ‘must, in exercising [their] functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity’ (Section 40 (1)). Criteria for selection of priority habitats and species include, for example, international threat (such that species may be protected in their strong holds) and marked national decline.

The **National Planning Policy Framework 2021**⁶ states that the planning system should minimise impacts on biodiversity, providing net gains in biodiversity, wherever possible. Section 15 states that when determining planning applications, local planning authorities should apply the following principles:

- a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons⁷ and a suitable compensation strategy exists; and
- d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

⁴Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, and Council Directive 79/409/EEC on the Conservation of Wild Birds, respectively.

⁵The **NERC Act** refers to “*species of principle importance for the conservation of biodiversity*”, which translates to BAP habitats and species occurring in England.


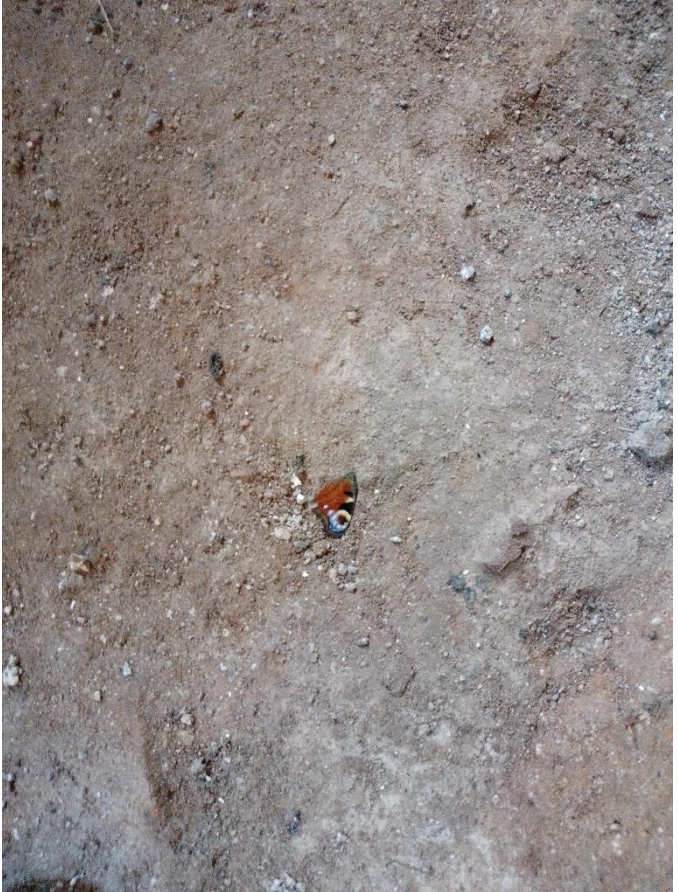
⁶ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf



⁷ For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat.

Appendix 2 – Photographs

| No | Photo | Description |
|----|---|--|
| 1 |  A photograph of a two-story stone house with a gabled roof and a chimney. The house is situated on a grassy hillside. The front facade features a central white door and several windows. The surrounding area is covered in green grass and some trees. | External view of main house looking west, with amenity grassland in front. |
| 2 |  A photograph of the south elevation of the main house, showing a stone wall and a gabled roof. Three red circles are drawn on the roofline, indicating the locations where bats were recorded emerging from gaps between the roof and wall. The sky is clear and blue. | South elevation of main house. A total of three common pipistrelle, three soprano pipistrelle and one Daubenton's bat were recorded emerging from gaps between the roof and wall (locations shown in red circles). |

| No | Photo | Description |
|----|--|--|
| 3 |  | Gaps between wall and roof on south elevation of main house. |
| 4 |  | View of ground floor in main house. |

| No | Photo | Description |
|----|--|------------------------------------|
| 5 |  | Bat droppings. |
| 6 |  | Butterfly wings (feeding remains). |

| No | Photo | Description |
|----|--|--|
| 7 |  | View looking east showing the amenity grassland, eastern boundary hedgerow and scattered trees |
| 8 |  | View of internal roof structure with gaps in roofing felt and between beams and wall. |

Appendix 3 – Bat DNA Results



10 September 23

Re: Identification Results for Becca Brown, Wild Service

Job number 20037, received 04 August 2023

Sample labelled: PO: 3317 Project: BB2023002

PCR amplification successful. DNA sequence:

CCTAATAGGGACCCAAAATTCATCATGCTGAAATGTTTGATGGAGCTGGTAGATCAA
TGAATGAGTTATTGATGATTTTGATCAGGGGGTGGGACTTTCGAATGTTGGTCAT

Phylogenetic analysis identification: *Pipistrellus pipistrellus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

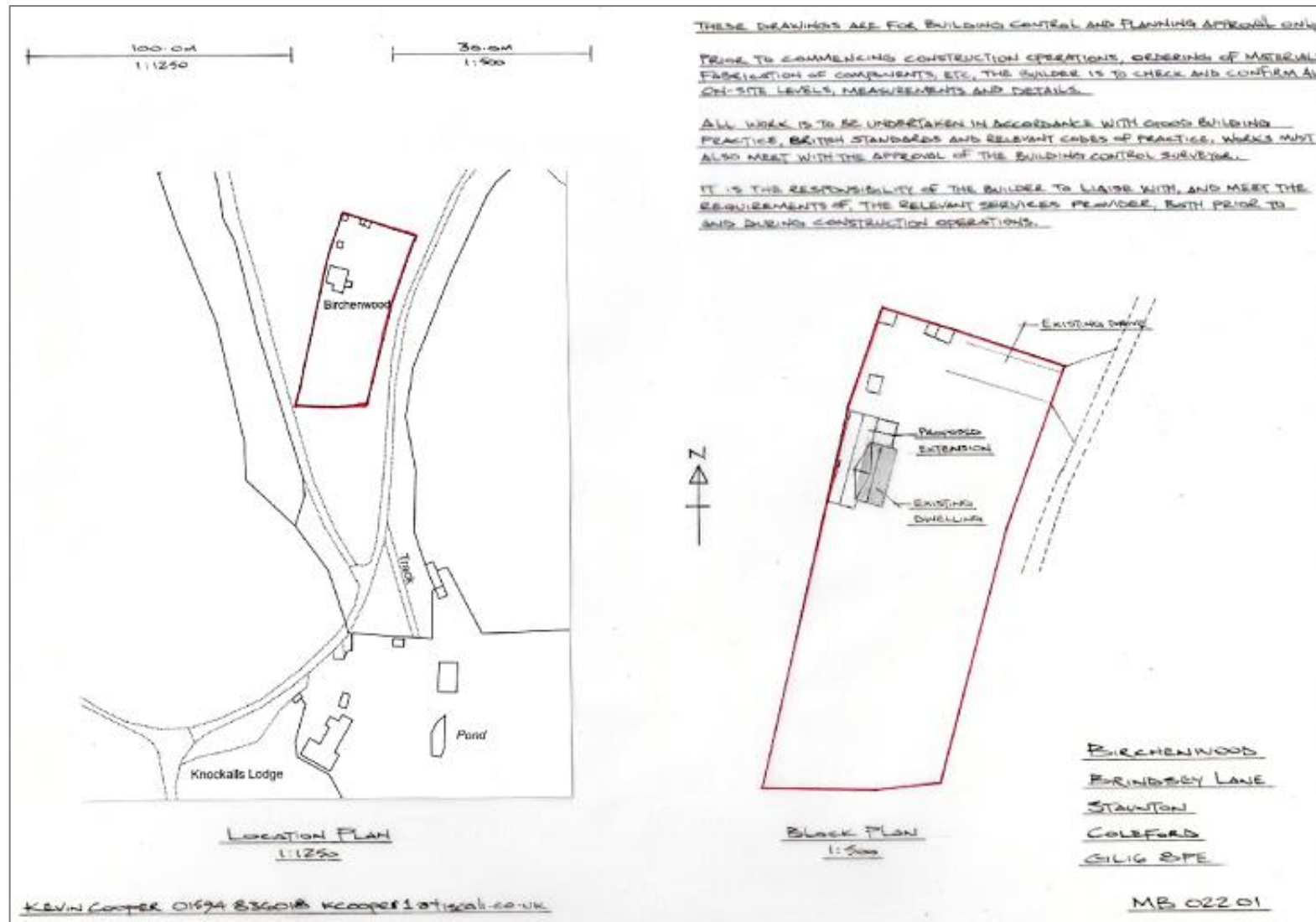
Professor Robin Allaby

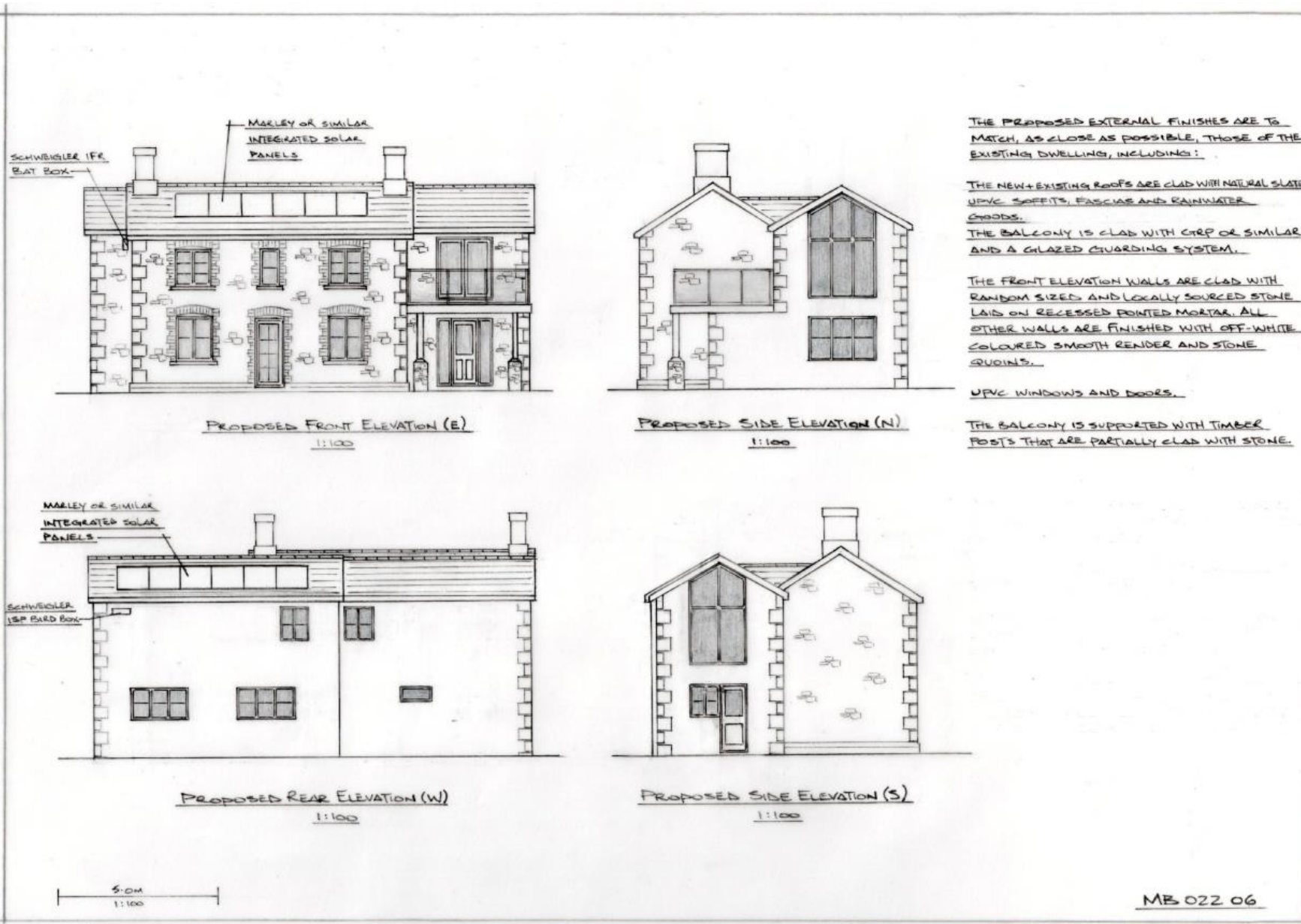
The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

Professor Robin Allaby

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Gibbet Hill Campus,
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Coventry CV4 7AL
Tel: 02476575059
Fax: 02476574500
Email: r.g.allaby@warwick.ac.uk

Appendix 4 – Proposed Development





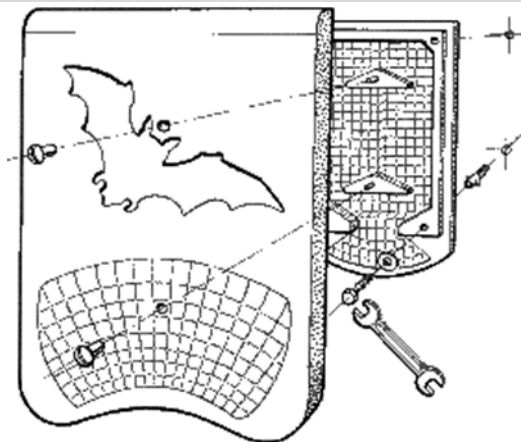
Appendix 5 – Ecological Enhancements

BAT ROOSTING FEATURES

Schwegler 1FF bat box



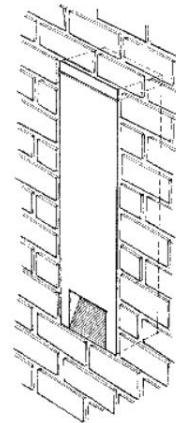
Schwegler 1WQ Summer & Winter bat



Habibat 001 Bat Box – integral bat box, fitted into wall



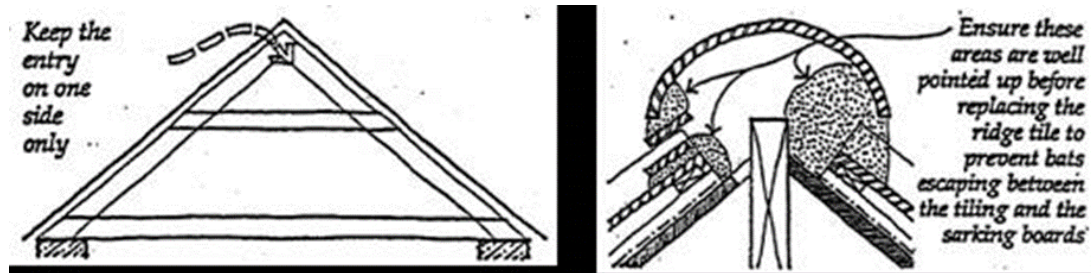
Schwegler 1FR Bat Box



Schwegler 2FN bat box for installation in trees



Diagrammatic view of ridge tile and cross section through ridge tile showing access point (taken from Scottish Natural Heritage 1996). Bitumastic lining must be used near/on the ridge beam to ensure bats can only have contact with this type of membrane to avoid any possible entanglement with a breathable membrane.



Bat access tiles



BIRD BOXES

Various designs of swift boxes



Swift Brick



Swallow Cup



Hole-fronted bird box (for trees)



Open-fronted bird box (for trees)



House Martin Terrace Box



Many wildlife species benefit greatly from considerate planting choices that still meet our practical and aesthetic needs. Plants and trees provide food for wildlife as well as places to nest and rest. Vegetation providing a variety of these functions creates an environment more beneficial for wildlife.

Non native species

Native species provide the best habitat for UK wildlife but there are also many non-native species, which are single flowering and/or provide fruits/nuts/seeds that can be used as food sources for insects, birds and small mammals. When using these non-native species in planting schemes, care should be taken to avoid invasive species such as Cotoneaster and Rhododendron. This is especially important when sites are adjacent to open countryside particularly nature reserves.



Butterfly bush

Uses of Wildlife Planting

Wildlife value can be easily incorporated into visually pleasing and useful green areas and amenity spaces, such as borders, grass verges and tree screens.

Attractive Borders: Well selected decorative borders can be valuable for many insects and birds. Native plants can be mixed with single flowering ornamental species to add aesthetic interest and increase the flowering period of a planting scheme.

Shrubs and hedges: Native spiky species like blackthorn and hawthorn are effective barriers when used in hedges. They also provide an attractive feature at all times of year especially when in blossom and fruit. Bushy areas of foliage provide useful nesting and feeding areas for birds and small mammals, as well as foraging/commuting corridors for bats.

Grasses mixes and verges: Leaving uncut areas of suitable grasses provides great wildlife value and is economical to manage. Diverse grassy areas and verges also create an attractive human environment with different flowers and colours. There are a range of native grass and flower mixes for various soil types available on the market.



Wild flower grass mix



Selecting Suitable Species

There are wildlife friendly species suitable for all situations, from fields, verges, shady corners or small gardens. Listed below are native wildlife friendly plant species organised by type and suitability for different locations.

Large Trees

Ash *Fraxinus excelsior*
Beech *Fagus sylvatica*
English Elm *Ulmus procera*
Oak *Quercus robur* or *Q. petraea*
Small-leaved lime *Tilia cordata*
White willow *Salix alba*
Wild cherry *Prunus avium*



White willow

Medium/small trees

Alder *Alnus glutinosa*
Aspen *Populus tremula*
Crab apple *Malus sylvestris*
Field maple *Acer campestre*
Holly *Ilex aquifolium*
Rowan *Sorbus aucuparia*
Silver birch *Betula pendula*
Yew *Taxus baccata*



Tussocky grassland

Native shrubs

Blackthorn *Prunus spinosa*
Dogwood *Cornus sanguinea*
Elder *Sambucus nigra*
Guelder rose *Viburnum opulus*
Hawthorn *Crataegus monogyna*
Hazel *Corylus avellana*



Blackthorn

Plants for shady areas

Archangel *Lamium galeobdolon*
Betony *Stachys officinalis*
Bluebell *Hyacinthoides non-scriptus*
Bugle *Ajuga reptans*
Foxglove *Digitalis purpurea*
Ground ivy *Glechoma hederacea*
Lily of the valley *Convallaria majalis*
Lords-and ladies/cuckoopint *Arum maculatum*
Nettle-leaved bellflower *Campanula trachelium*
Primrose *Primula vulgaris*
Sweet violet *Viola odorata*
Wild daffodil *Narcissus pseudo-narcissus*

Plants for marshy areas & pond edges

Bugle *Ajuga reptans*
Hemp agrimony *Eupatorium cannabinum*
Marsh marigold *Caltha palustris*
Marsh woundwort *Stachys palustris*
Meadowsweet *Filipendula ulmaria*
Purple loosestrife *Lythrum salicaria*
Ragged robin *Lychnis flos-cuculi*
Water avens *Geum rivale*
Water forget-me-not *Myosotis scorpioides*
Water mint *Mentha aquatica*
Water violet *Hottonia palustris*
Yellow flag *Iris pseudacorus*

**Beneficial cultivated plants
(generally non-natives)**

Grecian windflower *Anemone blanda*
Angelica *Angelica archangelica*
Aubretia *Aubretia deltoidea*
California poppy *Eschscholtzia californica*
Candytuft *Iberis sempervirens*
Christmas rose *Helleborus niger*
Cosmos *Cosmos bipinnatus*
Evening primrose *Oenothera biennis*
Fleabane *Erigeron spp.*
Forget-me-not *Myosotis spp.*
French marigold *Tagetes patula*
Globe thistle *Echinops ritro*
Grape hyacinth *Muscari botryodes*
Hollyhock *Althaea rosea*
Honesty *Lunaria rediviva*
Ice plant *Sedum spectabile*
Lenten rose *Helleborus orientalis*
Tree mallow *Lavatera spp.*
Michaelmas daisy *Aster novae-belgii*
Mint *Mentha x rotundifolia*
Perennial cornflower *Centaurea montana*
Perennial sunflower *Helianthus decapetalus*
Phlox *Phlox paniculata*
Poached-egg plant *Limnanthes douglasii*
Red valerian *Centranthus ruber*
Snapdragon *Antirrhinum majus*
Spring crocus *Crocus chrysanthus* and hybrids
Sweet alyssum *Lobularia maritima*
Sweet bergamot *Monarda didyma*
Sweet William *Dianthus barbatus*
Tobacco plant *Nicotiana affinis*
Wallflower *Cheiranthus cheiri*
Alpine rock-cress *Arabis alpina*
Winter aconite *Eranthis hyemalis*
Yellow alyssum *Alyssum saxatile*

Native wildflowers for borders

Agrimony *Agrimonia eupatoria*
Betony *Stachys officinalis*
Bluebell *Hyacinthoides non-scriptus*
Chicory *Cichorium intybus*
Chives *Allium schoenoprasum*
Common poppy *Papaver rhoeas*
Corncockle *Agrostemma githago*
Cornflower *Centaurea cyanus*
Corn marigold *Chrysanthemum segetum*
Cowslip *Primula veris*
Cuckooflower *Cardamine pratensis*
Dame's-violet *Hesperis matronalis*
Devil's-bit scabious *Succisa pratensis*
Field scabious *Knautia arvensis*
Foxglove *Digitalis purpurea*
Goldenrod *Solidago virgaurea*
Great mullein *Verbascum thapsus*
Greater knapweed *Centaurea scabiosa*
Harebell *Campanula rotundifolia*
Herb-robert *Geranium robertianum*
Lady's bedstraw *Galium verum*
Marjoram *Origanum vulgare*
Meadow cranesbill *Geranium pratense*
Common mallow *Malva sylvestris*
Oxeye daisy *Leucanthemum vulgare*
Primrose *Primula vulgaris*
Red campion *Silene dioica*
Snowdrop *Galanthus nivalis*
Spiked speedwell *Veronica spicata*
Tansy *Tanacetum vulgare*
Teasel *Dipsacus fullonum*
Toadflax *Linaria vulgaris*
White campion *Silene alba*
Wild thyme *Thymus drucei*
Yellow loosestrife *Lysimachia vulgaris*



Marjoram



Cornflower



Perennial sunflower

Appendix 6 – Ecological Experience

Becca Brown: Senior Ecologist, BSc (Hons) ACIEEM

Becca has been working in ecological consultancy since 2016 and has been involved in a wide range of surveys including Extended Phase 1 Habitat surveys and a variety of protected species surveys including bats, badger *Meles meles*, barn owl *Tyto alba*, great crested newt *Triturus cristatus*, hazel dormouse *Muscardinus avellanarius*, reptiles, otter *Lutra lutra* and water vole *Arvicola amphibius*. She has experience in writing technical reports, including Preliminary Ecological Appraisals (PEAs), Ecological Impact Assessments (EclAs) and preparation of European Protected Species (EPS) licence applications. She also has experience undertaking Habitat Conditioned Assessments and Biodiversity Net Gain (BNG) calculations as well as being experienced and certified to carry out River Condition Assessments. Becca is experience as an Ecological Clerk of Works (ECoW) for a variety of projects. Becca Holds Natural England Class Licences for bats (level 1), barn owl and great crested newt. She also holds a valid CSCS card, is mental health first aider and is an Associate member of the Chartered Institute of Ecology and Environmental Management (ACIEEM).

Becca has a degree in Conservation Biology from the University of the West of England, Bristol and went on to complete a Certificate in Ecological Consultancy. Becca has been involved in numerous conservation volunteer opportunities over the years, including undertaking dormouse surveys for the Somerset mammal group, undertaking radio tracking for Bechstein's bats and bat box checks for the Somerset bat group, and undertaking smooth snake surveys with the Amphibian and Reptile Conservation Trust. Becca is currently working towards her Natural England Level 2 bat licence and dormouse licence.

Julia Morrison: Ecologist, BSc (Hons) MSc

Julia has worked with Wild Service for several years and has recently gained her MSc in Applied Ecology from the University of Gloucestershire. Julia's dissertation project involved large-scale data analysis of biometric bird ringing data to assess biometric changes in UK

wintering waterbirds. Julia has a keen interest in bat ecology and in addition to undertaking professional bat surveys and assessments, she has also studied bats in Ghana, West Africa. She is experienced in a range of ecological surveys including Phase 1 habitat assessments, protected species surveys, reptile surveys and translocations, great crested newt and dormouse surveys. Julia's additional skills include advanced data analysis and GIS mapping using various software packages including QGIS and ArcGIS. In addition to project delivery, she also assists with the management of Wild Service projects. Julia has also spent time volunteering on conservation projects with the Gloucestershire Bat Group and the Gloucestershire Wildlife Trust. Julia is a Qualifying member of CIEEM and holds a CSCS card. She is currently working towards her Natural England bat and great crested newt licences.

Elizabeth Pimley: Head of Ecology & Principal Ecologist, BSc (Hons) PhD, CEnv MCIEEM

Elizabeth has worked in both the academic and consultancy ecology sectors since 2000 with a focus on mammalian ecology, particularly badgers, dormice, bats, water voles and otters. Elizabeth manages the Consultancy as well as being involved in project delivery. She has managed ecological projects, ranging in size and type, both in the UK and abroad. She regularly advises clients on the planning process in relation to Ecology. Elizabeth has expertise in a wide variety of ecological survey techniques including Preliminary Ecological Appraisals/Phase 1 habitat assessments and a variety of protected species surveys (e.g. the aforementioned mammal species as well as reptiles and great crested newts).

Elizabeth also devises ecological mitigation schemes, both as part of protected species mitigation licences (e.g. bats, great crested newts, badgers, dormice, water voles, otters) and for projects not requiring licensing (e.g. reptiles). She has produced a wide variety of preliminary ecological appraisals, BREEAM/CSH Ecology Assessments, mitigation licences for protected species (including Bat Mitigation Class Licences), Ecological Impact Assessments (EclA), Construction Ecological Management plans, Habitat Regulations Assessments, Biodiversity Net Gain assessments, Biodiversity Enhancement Schemes, Ecological Design Strategies as well as writing for scientific journals, books and magazines. As a Building with Nature Assessor, Elizabeth also has expertise in providing green infrastructure advice to projects.

Elizabeth offers a scientific approach to projects with additional skills in radiotracking, bat call analysis, statistical analysis, home range and compositional habitat analysis and Geographical Information Systems (GIS) mapping. Elizabeth holds Natural England and Natural Resources Wales licences for bats and dormice as well as Natural England licences for great crested newts and water voles. She is also a Registered Consultant of the Bat Low Impact Class (BLIC) Licence and holds a CSCS card.



ECOLOGICAL SERVICES

MITIGATION

CONSERVATION

- We provide ecological surveys and assessments, mitigation, advice and guidance regarding wildlife, plants and habitats for both development and conservation projects throughout the UK.
- Wild Service is the Ecological Consultancy for Gloucestershire Wildlife Trust. As such, the company reinvests its profits into local conservation work.
- We are also part of a wider network of Wildlife Trust Consultancies enabling us to offer national delivery with local expertise.

- We offer the following types of service to clients:

Ecological Surveys
Protected Species Licences
Ecological Management Plans
Biodiversity Net Gain
Ecological Impact Assessments (EclA)
BREEAM Assessments
Mitigation, Enhancement & Rewilding
Green Infrastructure Planning (Building with Nature)
Arboricultural Surveys
Landscape Consultancy Services

Contact us at
Wild Service,
Conservation Centre
Robinswood Hill Country Park
Reservoir Road, Gloucester, GL4 6SX
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