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# EVOLUTION ECOLOGY LTD

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**“Providing Common Sense Solutions for Sustainable Development”**

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## **Malvern Cottage**

**Bat and Bird Presence/Absence Survey Report – August 2023**



Bat and Bird Presence/Absence Survey

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**Bat and Bird Presence/Absence Survey**

At

**Malvern Cottage,**  
**Gorse Lane,**  
**Chobham**  
**Surrey**  
**GU24 8RB**

For

**Tim Humphries (Associate), Firstplan Ltd.**

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Bat and Bird Presence/Absence Survey

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**0. Executive Summary**

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0.1 Report rationale

This report has been prepared at the request of Tim Humphries (Associate), Firstplan Ltd. This is about the identification and location of protected bats and bird species at Malvern Cottage, Gorse Lane, Chobham, Surrey, GU24 8RB (grid reference: SU 97202 63087, What3Words: turkey.dress.accent).

The 'Preliminary Roost Appraisal (PRA) Survey' (daytime inspection survey) and the bat activity surveys were undertaken by Evolution Ecology Ltd on the following dates;

- 2<sup>nd</sup> of April 2023 (PRA survey).
- 13<sup>th</sup> May 2023 (dusk bat activity survey).
- 11<sup>th</sup> June 2023 (dusk bat activity survey).
- 21<sup>st</sup> August 2023 (dawn bat activity survey).

0.2 Background

Under the current proposals, the building is to be demolished.

Bat and Bird Ecology

**Bats** - From the information obtained during the bat activity surveys, it can be established that there are no roosting bats inside the building, with no Natural England mitigation or compensation measures required to be implemented at the site. However, enhancement measures should be implemented at the site. Please see 'Section 5 – Ecological Provisions' for an outline of the proposed ecological provisions (enhancement measures) for the works at the site.

**Birds** – There is one active Jackdaw nest at the site. Please see 'Section 5 – Ecological Provisions' for an outline of the proposed ecological provisions for the works at the site.

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 Bat and Bird Presence/Absence Survey
 

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**Contents**

<b>0</b>	<b>Executive summary</b>	<b>3</b>
<b>1</b>	<b>Introduction</b>	<b>5</b>
1.1	Site Description	
1.2	Proposed Works	
1.3	Aims of survey	
<b>2</b>	<b>Survey Methodology</b>	<b>9</b>
2.1	Summary of survey methods	
2.2	Pre-survey data search	
2.3	Surveyors information	
2.4	Field surveys	
2.4.1	Habitat surveys	
2.4.2	Roost survey – weather conditions and timing	
2.4.3	Roost and Activity surveys	
<b>3</b>	<b>Results</b>	<b>15</b>
3.1	Pre-survey data search	
3.2	Field surveys	
3.2.1	Habitat description	
3.2.2	Roost survey	
3.2.3	Summary of Roost survey	
3.2.4	Activity surveys	
<b>4</b>	<b>Impact Assessment</b>	<b>24</b>
4.1	Constraints on survey information	
4.2	Constraints on equipment used	
4.3	Potential impacts of development	
4.3.1	Designated sites	
4.3.2	Roosts	
4.3.3	Foraging and commuting habitat	
4.4	Legislation and policy guidance	
<b>5</b>	<b>Ecological Provisions</b>	<b>26</b>
<b>6</b>	<b>Summary</b>	<b>30</b>
6.1	Bat and Bird Ecology	
6.2	Ecological Provisions	
<b>7</b>	<b>References</b>	<b>31</b>
<b>8</b>	<b>Appendices</b>	<b>32</b>
<b>9</b>	<b>LIMITING CONDITIONS / DISCLAIMERS</b>	<b>43</b>

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**Bat and Bird Presence/Absence Survey**

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**1 INTRODUCTION**

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This report has been prepared at the request of Tim Humphries (Associate), Firstplan Ltd. This is about the identification and location of protected bats and bird species at Malvern Cottage, Gorse Lane, Chobham, Surrey, GU24 8RB (grid reference: SU 97202 63087, What3Words: turkey.dress.accent).

The 'Preliminary Roost Appraisal (PRA) Survey' (daytime inspection survey) and the bat activity surveys (dusk/dawn) were undertaken by Evolution Ecology Ltd on the following dates;

- 2<sup>nd</sup> of April 2023 (PRA survey).
- 13<sup>th</sup> May 2023 (dusk bat activity survey).
- 11<sup>th</sup> June 2023 (dusk bat activity survey).
- 21<sup>st</sup> August 2023 (dawn bat activity survey).

**Please Note (dawn bat surveys); Bat Conservation Trust (BCT)** – “This Interim Guidance Note aims to provide clarification regarding the role of night vision, infrared and thermal imaging cameras (night vision aids or NVAs) in bat emergence surveys.

It also relaxes the current requirement for dawn surveys, where the use of night vision aids improves the quality of emergence surveys. The note has been produced in lieu of the publication of Bat Surveys for Professional Ecologists Good Practice Guidelines 4th edition, now predicted to be later in 2023. The note supersedes the 3rd edition (Collins, 2016). The text has been prepared by Bat Conservation Trust (BCT), discussed and agreed with the Statutory Nature Conservation Body (SNCB) mammal specialists and the Technical Review Board for the 4th edition of the survey guidelines have also been given the opportunity to comment”.

Please see section '3 Results' for information on the thermal and night vision equipment used.

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**Bat and Bird Presence/Absence Survey**

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**1.1 Site Description**

The Malvern Cottage site on Gorse Lane comprises a building, amenity grassland, trees, and hedgerow.

The surrounding area is characterised by residential dwellings, roads, pathways, scattered trees, woodland and amenity grassland.

Therefore, the site and the surrounding area contain roosting/nesting and foraging features for the local bat and bird populations.

**Figure 1:** An aerial map showing the location of the site/building in relation to some of the local landscape.



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**Bat and Bird Presence/Absence Survey**

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**1.2 Proposed works**

Under the current proposals, the building is to be demolished to make way for the construction of a new dwelling at the site.

**1.3 Aims of the survey**

The actions of the surveyors on-site and during the production of the report were conducted in accordance with Bat Conservation Trust (BCT) guidelines (3<sup>rd</sup> Edition). The survey aimed to undertake an appraisal of the building/s and the surrounding area to establish the following:

**1.3.1 Survey protocol considered any protected bat species on-site****Bats**

- To establish the probability of bats and their roost sites being present at the proposed redevelopment site.
- To assess the roost status.
- To assess suitable food resources and habitat requirements.
- If a roost site is found, provide an impact assessment.

**1.3.2 Survey protocol also considered any protected bird species on-site:****Barn Owls**

- To establish if barn owls were using the site.
- To locate nest sites if present.
- To assess what types of activities were shown within the site of interest.
- To evaluate suitable food resources and habitat requirements.
- To provide an impact assessment if barn owls are present.

**Birds**

- To establish if birds were using the site.
- To locate nest sites if present.
- To assess what types of activities were shown within the site of interest.
- To evaluate suitable food resources and habitat requirements.
- To provide an impact assessment if nests are found.

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Bat and Bird Presence/Absence Survey

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1.3.3 The information was subsequently used in conjunction with the knowledge of the proposed works at the site to determine:

- What impacts are the works likely to have on any protected species found at the site.
- The need for any Natural England development licence application to be made in respect of activities concerning protected species.
- Recommendations for any mitigation measures that would be required.



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**Bat and Bird Presence/Absence Survey**

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**2 SURVEY METHODOLOGY**

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**2.1 Summary of Survey Methods**

This report aims to provide an ecological evaluation of the site in relation to its suitability for bat and bird utilisation. The survey considered the potential for roosting bats and gathered any anecdotal evidence (i.e., bats, bat droppings, feeding remains, urine stains and grease marks) that may support their presence within the building unit(s).

**2.1.1 Walkover Survey**

A walkover survey of the site and a visual inspection of the building/s and any trees were undertaken to determine the availability of the required resources for the protected species in the immediate area. This would allow us to determine:

- Presence or absence of bats on-site (i.e., roosting).
- Evidence and/or potential of bat roosts on-site (i.e., summer roosts).
- Whether additional surveys are required.

**2.1.2 External Inspection of the Building/s Elevations**

The building on-site were inspected both externally and internally for signs of bat activity. Notes were made on the following in accordance with the guidelines published by the BCT for the scoping and surveying of building/s and built structures:

The objective of this survey was to locate suitable ingress and egress points that protected species (bats) could use to fly into the building/s and identify any areas within the building/s where these species may be able to roost and/or nest. The survey method used to inspect the external walls and roof of the buildings was a visual assessment using binoculars, a torch, an endoscope, and ladders in full daylight.

This allowed us to determine the following information:

- Type and age of building/s.
- Type of construction.
- Presence of potential roost features (e.g., missing roof tiles, raised tiles, roof voids).
- Presence of suitable entry and exit points (e.g., broken windows, missing windows and doors/ridges and the apex of the buildings).
- Amount and location of evidence of bats, such as the presence of live or dead bats, droppings, grease marks, urine stains and characteristic smell of bats.

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## Bat and Bird Presence/Absence Survey

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### 2.1.3 Internal Inspection of the Building/s Elevations and Rooms

This survey aimed to locate and focus on areas that provide appropriate environmental conditions for bats. To do this, we must:

- Look for warm, dark areas, joints, crevices, beams and cavities for possible bat roost sites and nest sites.
- Locate roost sites.
- Listen for bats.
- Examine floors, walls and structural elements for droppings, corpses, skeletons and dead insects.

### 2.1.4 Building/s Rating

In the absence of evidence, structures have been assigned a rating of suitability from negligible to a high potential for supporting bats. The rating is based on the location of the structure in the surrounding landscape, the number and type of features suitable for use by bats and the surveyor's experience.

For example, a structure with a high level of regular disturbance with few opportunities for access by bats that is in a highly urbanised area with few or no mature trees, parkland, woodland or wetland would generally equate to having negligible potential. Conversely, a pre-20<sup>th</sup> century or early 20<sup>th</sup>-century building with many features suitable for use by bats close to good foraging habitat would have high potential.

### 2.1.5 Roost Categories

Any structures with evidence of bats will be further evaluated to assess which of the following roost categories may be present on-site (if any):

- **Maternity or Nursery Roost** – used by breeding bats, where pups are born and raised to independence (anecdotal evidence may support this prospect).
- **Hibernation Site** – where bats may be found during the winter (this is assessed within the context of this report).
- **Daytime Summer Roost** – used by males and/or non-breeding females.
- **Night Roost** – where bats rest between feeding bouts during the night but are rarely present during the day.
- **Feeding Roost** – where bats temporarily hang up to eat an item of prey.

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## Bat and Bird Presence/Absence Survey

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- **Transitional (or Swarming) Site** – where bats may be present during the spring or autumn (this cannot be assessed within the context of this report).

### 2.1.6 Bat Detector Survey (Dusk/Dawn surveys)

If required, this survey aims to detect active bats leaving possible roost sites identified in the external and internal surveys. This is achieved by:

- Being at the site 30 minutes before sunset and 90 minutes before sunrise.
- Listening to social calls at potential roost sites.
- Standing at different transect points around the buildings, using the bat detector to hear the bats, plus trying to see the first bats emerge.
- Standing at different transect points at foraging areas.
- Carrying out this survey up to two hours after the first bats emerge and 15 minutes after sunrise. This will cover the emergence and returning period to the roost site for some bat species.

2.1.7 Evidence will be used to determine whether a European Protected Species (EPS) licence will be required to ensure legal compliance during development. This will also include identifying which mitigation measures [if any] would be most appropriate.

## 2.2 Pre-survey data search

2.2.1 Surrey Biodiversity Information Centre (SBIC) was commissioned to conduct an ecological data search of all protected bat species within a 2km radius of the site.

## 2.3 Surveyors Information

2.3.1 The survey was undertaken by licensed bat ecologist/s and members of the Institute of Ecology & Environmental Management (CIEEM):

- **Mr Paul Keeling** BSc (Hons), MCIEEM, Principal Ecologist, Natural England Bat Survey Licence Number: 2015-11546-CLS-CLS Bat Survey Level 2.
- **Mr Ashley Milward** - Assistant Ecologist.

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 Bat and Bird Presence/Absence Survey
 

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## 2.4 Field surveys

2.4.1 Evolution Ecology Ltd has no previous ecology information about the site.

2.4.2 Roost Surveys - Weather conditions and timing

The building on-site was externally and internally inspected for the presence of bats and birds using binoculars, torches, an endoscope and ladders in full daylight.

**Table 1: Preliminary Roost Appraisal (PRA) Survey and Dusk Activity Survey, Environmental Variables**

Environmental variables	PRA Survey of the building/site – 2 <sup>nd</sup> of April 2023.
Temp Start	9°C
Temp Finish	10°C
Humidity Start	64%
Humidity Finish	64%
Cloud Cover Start	100%
Cloud Cover Finish	100%
Wind Speed Average	3mph
Precipitation	Dry

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 Bat and Bird Presence/Absence Survey
 

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**Table 2:** Dusk Activity Survey, Environmental Variables

Environmental variables	Dusk Activity Survey – 13 <sup>th</sup> May 2023.
Temp Start	12°C
Temp Finish	11°C
Humidity Start	85%
Humidity Finish	85%
Cloud Cover Start	50%
Cloud Cover Finish	50%
Wind Speed Average	None
Precipitation	Dry

**Table 3:** Dusk Activity Survey, Environmental Variables

Environmental variables	Dusk Activity Survey – 11 <sup>th</sup> June 2023.
Temp Start	19°C
Temp Finish	19°C
Humidity Start	100%
Humidity Finish	100%
Cloud Cover Start	75%
Cloud Cover Finish	75%
Wind Speed Average	None
Precipitation	Dry

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 Bat and Bird Presence/Absence Survey
 

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**Table 4:** Dusk Activity Survey, Environmental Variables

Environmental variables	Dawn Activity Survey – 21 <sup>st</sup> August 2023.
Temp Start	10°C
Temp Finish	11°C
Humidity Start	85%
Humidity Finish	85%
Cloud Cover Start	75%
Cloud Cover Finish	75%
Wind Speed Average	None
Precipitation	Dry

### 2.4.3 Roost and Activity Surveys

During the PRA survey, the types of equipment used included an endoscope, ladders and torches.

The type of equipment used during the dusk and dawn bat activity surveys are the Batbox Duet, S.S.F. Bat2 heterodyne and frequency division bat detectors, along with the Echo Meter Touch 2 (E.M.T.) bat detector.

#### Echo Meter Touch 2

The E.M.T. bat detector is a data recorder that distinguishes bat calls from other sound sources in real-time (online signal analysis). Calls are recorded digitally as call sequences. The E.M.T. is used alongside Batbox Duet and S.S.F. Bat2 heterodyne and Frequency Division bat detectors and provides an unbiased statistical analysis of bat species recorded during a survey on site. All statistical analysis software is included in the E.M.T., giving us real-time results quickly and efficiently.

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 Bat and Bird Presence/Absence Survey
 

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### 3 RESULTS

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#### 3.1 Local Records Data Search

No bat records were identified at the site; however, several species of bats have been identified in the area.

- Noctule Bat
- Soprano Bat
- Brown Long-eared Bat
- Myotis species of bats

##### 3.1.1 Field surveys

##### 3.1.2 Habitat description

Woodlands and hedgerows surround Malvern Cottage. Therefore, the site and the surrounding area contain roosting/nesting and foraging features for the local bat and bird populations.

##### 3.2.1 Bat roost and birds nest (including barn owl) survey

**Table 4:** External features of the building identified during the PRA.

<u>External features for the building</u>	<u>Yes</u>	<u>No</u>
Clay tiles	<input checked="" type="checkbox"/>	
Slate tiles		<input checked="" type="checkbox"/>
Cement/concrete tiles		<input checked="" type="checkbox"/>
Felt roof		<input checked="" type="checkbox"/>
Pitch roof	<input checked="" type="checkbox"/>	
Skylights		<input checked="" type="checkbox"/>
Flat roof		<input checked="" type="checkbox"/>
Brick solid walls	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Brick walls	<input checked="" type="checkbox"/>	
Timber beams		<input checked="" type="checkbox"/>
Rendered walls	<input checked="" type="checkbox"/>	
Gaps in the windows		<input checked="" type="checkbox"/>
Cracks/crevices in walls		<input checked="" type="checkbox"/>
Slipped/missing/dislodged tiles	<input checked="" type="checkbox"/>	
Gaps around fascia/soffit	<input checked="" type="checkbox"/>	
Air/ridge vents		<input checked="" type="checkbox"/>
Birds' nests		<input checked="" type="checkbox"/>
Prefabricated steel sheeting		<input checked="" type="checkbox"/>
Breeze Blocks		<input checked="" type="checkbox"/>
<b>Notes:</b> N/A		

## Bat and Bird Presence/Absence Survey

**Table 5:** Internal features for the buildings identified during the PRA.

<b><u>Internal features for the building</u></b>	<b><u>Yes</u></b>	<b><u>No</u></b>
Shed Roof		<input checked="" type="checkbox"/>
Timber beams	<input checked="" type="checkbox"/>	
Steel beams		<input checked="" type="checkbox"/>
Commercial rooms		<input checked="" type="checkbox"/>
Educational rooms		<input checked="" type="checkbox"/>
Storage rooms		<input checked="" type="checkbox"/>
Warehouse		<input checked="" type="checkbox"/>
Agricultural (inc. domestic livestock)		<input checked="" type="checkbox"/>
Derelict building		<input checked="" type="checkbox"/>
Moth/Butterfly remains		<input checked="" type="checkbox"/>
Mouse droppings		<input checked="" type="checkbox"/>
Cobwebs	<input checked="" type="checkbox"/>	
Bat droppings	<input checked="" type="checkbox"/>	
Birds' nests	<input checked="" type="checkbox"/>	
<p><b>Cobwebs</b> – Cobwebs were hanging from the loft space where the droppings were found. The presence of cobwebs can indicate the lack of pre-emergent flying bats inside a loft space. Bats flying around will prevent cobwebs from building up inside a loft space.</p> <p><b>Bat Droppings</b> - A small scattering of brown/grey bat droppings (peak count of 7) were recorded in one of the loft spaces. The droppings were collected and sent off to SureScreen Scientifics to confirm the species of bats.</p> <p>DNA Results - The droppings belong to Brown Long-eared bats (for more information, please see Appendix D: Bat Droppings DNA Results)</p> <p><b>Age of Bat Droppings</b> – Fresh droppings are black (less than a year old), brown droppings indicate a few years of age, and grey droppings indicate they are several plus years old.</p> <p><b>Birds</b> – Jackdaws are nesting in the chimney stack at the house.</p>		



## Bat and Bird Presence/Absence Survey

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### 3.2.3 Summary of the External and Internal Inspections

Due to the presence of bat droppings, the number of potential access points, and suitable roosting features, the building has a 'moderate to high' potential for roosting bats.

Therefore, at least two bat activity surveys are required to be undertaken during the bat activity season (May to August/September).

**Table 6:** Low/Moderate/High potential building(s) survey recommendations. The full guidance can be found in the Bat Conservation Trust Good Practice Survey Guidelines. These guidelines are what all local authorities abide by.

Table 4.1 Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement.		
Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	<p>A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions<sup>a</sup> and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation<sup>b</sup>).</p> <p>A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.<sup>c</sup></p>	<p>Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.</p> <p>Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.</p>
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions <sup>a</sup> and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	<p>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.</p>
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions <sup>a</sup> and surrounding habitat.	<p>Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland.</p> <p>Site is close to and connected to known roosts.</p>

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**Bat and Bird Presence/Absence Survey**

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**3.2.4 Activity Dusk and/or Dawn Bat Surveys****13<sup>th</sup> of May 2023 Dusk Activity Survey –**

- During the dusk activity survey, no bats emerged from the building. However, one common pipistrelle bat was seen foraging around the garden/neighbouring building at dusk, implying that there is a roost nearby.
- Internal inspections of the loft space where the droppings were found were undertaken during the dusk bat activity survey to observe **Brown Long-eared (BLE)** bats undertaking pre-emergent flying in the loft space. They can spend up to an hour from dusk flying inside a loft space before they emerge from a loft/roof to go off to forage for the night.

No BLE's bats were seen inside the loft during the internal dusk loft inspections.

**11<sup>th</sup> of June 2023 Dusk Activity Survey –**

- **Common Pipistrelle** (*Pipistrellus pipistrellus*) bats: During the dusk activity survey, two Common Pipistrelle bats were seen flying past the site, along the northeast of the building.

No BLE's bats were seen inside the loft during the internal dusk loft inspections.

**21<sup>st</sup> of August 2023 Dawn Activity Survey –**

- **Common Pipistrelle** (*Pipistrellus pipistrellus*) bats: During the dawn activity survey, three Common Pipistrelle bats were seen flying past the site, along the northeast of the building.

No BLE's bats were seen/heard foraging around the site or entering the old roost during the dawn bat survey.

**Summary** – It can be concluded from the above survey results that the old bat droppings and the absence of pre-emergent flying BLE bats indicate that the roost in the loft space is no longer in use and hasn't been for several years (old bat droppings). Please see Table 5 above for further information.

Please see Figure 2 below for further information on the roost location and Appendix B for additional photographic records.

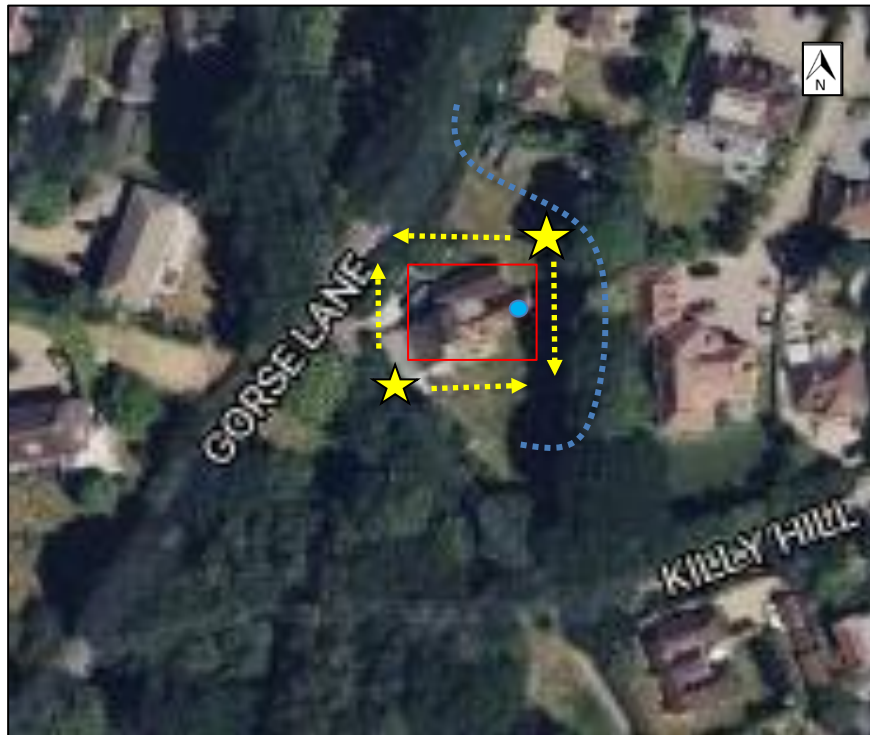
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**Bat and Bird Presence/Absence Survey**

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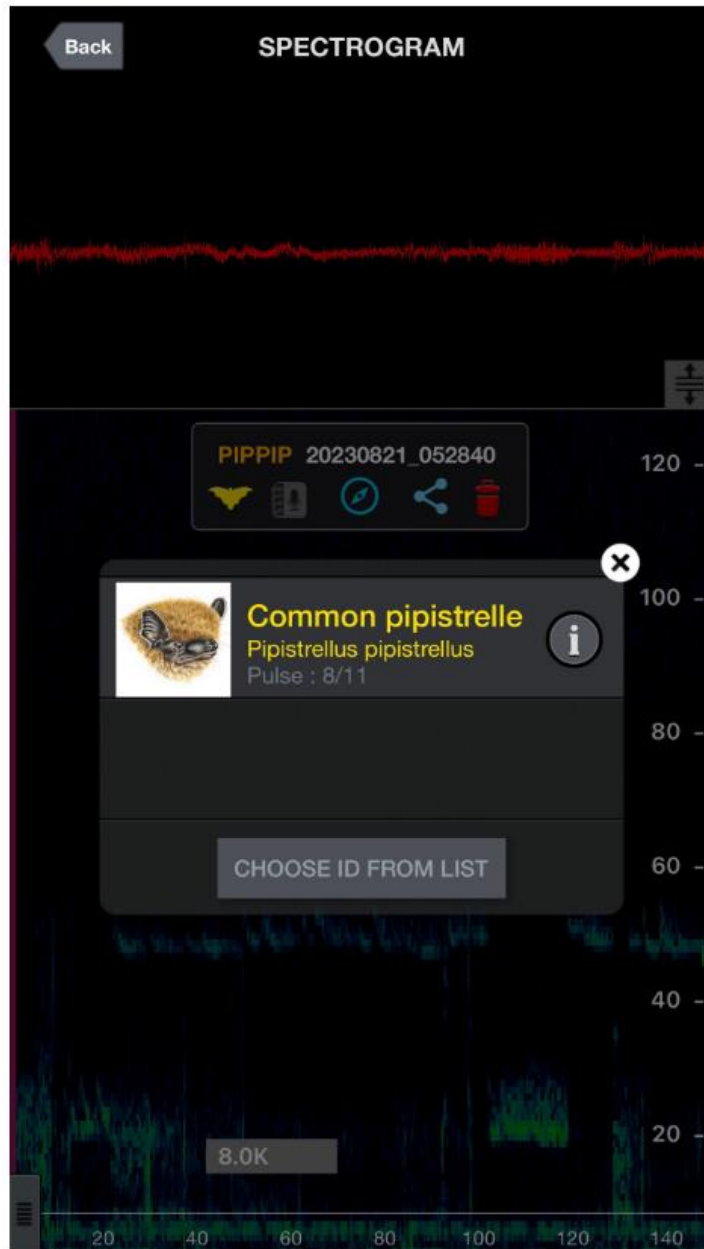
**Figure 2:** This image shows an aerial view of the building/site and the bat activity recorded.

- **Red outline** = building
- **Yellow stars** = the surveyors' locations during the two-dusk activity
- **Yellow arrows** = Ecologists' line of sight
- **Blue dotted line** = Flight path for the Common Pipistrelle (blue dotted line)
- **Blue dot** = Old BLE roost.



Bat and Bird Presence/Absence Survey

**Figure 3:** This spectrogram shows a Common Pipistrelle bat recorded flying/foraging near the site.



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**Bat and Bird Presence/Absence Survey**

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3.2.5 The LUX light meter reader confirmed the amount of artificial light pollution at the site and from nearby buildings and streetlights.

Bats have evolved to emerge at night, with only moonlight providing a source of light at night (up to 0.3 Lux). However, with the creation of artificial lights via streetlights, security lights, and lights coming from residential and commercial properties, light pollution can range from 4 Lux to 1000 Lux.

Impacts on bats and their roosts - Artificial lighting is known to affect bat roosting and foraging behaviour, with lighting shown to result in a range of effects, including roost desertion (BCT, 2009), delayed emergence of roosting bats (Downs et al., 2003), increased activity of some bat species and decreased activity by others (Stone et al., 2012).

Please see below the Lux meter reading recorded at the site.

**Figure 4:** This image shows minimal artificial light pollution at the site (0.04lux).



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Bat and Bird Presence/Absence Survey

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3.2.6 Thermal Image of the building (the thermal camera was used to aid in observing any bats emerging/returning from and to the building).

**Figure 5:** Thermal image of the site.

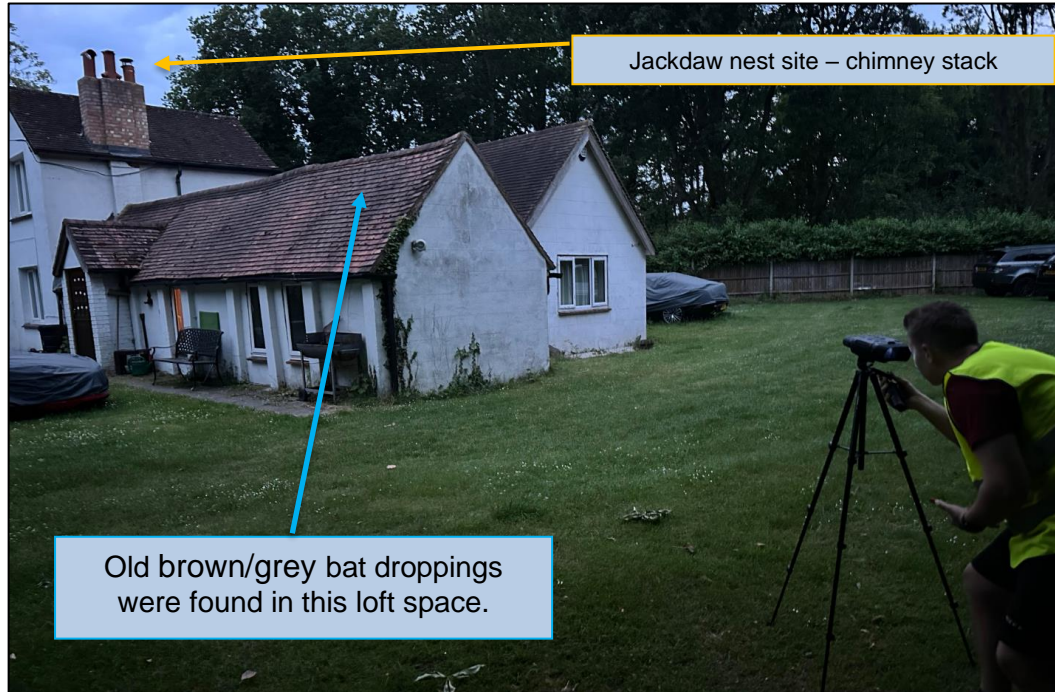




Bat and Bird Presence/Absence Survey

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**Figure 6:** An image of the ecologist using the night vision/infrared (IR) camera at the site and the locations of the old BLE bat roost and the jackdaw nest site.



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Bat and Bird Presence/Absence Survey

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## **4 IMPACT ASSESSMENT**

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### **4.1 Constraints on survey information**

There were no constraints with regard to obtaining survey information.

### **4.2 Constraints on equipment used**

No constraints were present with regard to the equipment used during the survey (i.e., endoscope, ladders, and high-powered binoculars).

### **4.3 Potential impacts of the re-development**

Based on the current planning proposal whereby:

Under the current proposals, the building is to be demolished.

- The potential impacts have been identified as follows:

#### **4.3.1 Designated sites**

Any designated sites nearby do not apply to the proposed project, as works on the building are taking place. This, therefore, means that any building work would be of no detriment to the surrounding landscape.

#### **4.3.2 Roosts**

##### **Short-term impacts: Disturbance**

There will be no impact on a bat roost/s, with no species-specific mitigation measures required to safeguard bats or their roost/s at the site.

##### **Long-term impacts: Roost modification**

Same as 'Short-term impacts: Disturbance.'

##### **Long-term impacts: Roost loss**

Same as 'Short-term impacts: Disturbance.'



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## Bat and Bird Presence/Absence Survey

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### 4.3.3 Foraging and Commuting Habitat.

It is considered that the work on the building would not affect foraging and commuting habitats in the area.

### 4.4 Legislation and Policy Guidance

National Planning Policy Framework, Section 11: The recently published framework in 2012 replaces the previous Planning Policy Statement 9. Section 11: Conserving and enhancing the natural environment reaffirms the government's commitment to maintaining green belt protections and preventing urban sprawl, retains the protection of designated sites and preserves wildlife, aims to improve the quality of the natural environment and halt declines in species and habitats, protects and enhances biodiversity and promotes wildlife corridors.

Article 10 of the E.C. Habitats Directive: The published article requires the government to develop features such as 'stepping-stones' on the landscape, such as clusters of ponds, tracts of rough grassland or scrubland and vegetated railway line embankments.

Wildlife and Countryside Act 1981: All species of bat are fully protected under the Wildlife and Countryside Act 1981, the European Conservation (Natural Habitats, etc.) Regulations 1994, and the Countryside and Rights of Way Act 2000. This legislation makes it illegal to possess or control any live or dead specimens, to damage, destroy or obstruct access to any structure or place used for shelter, protection or breeding, and to intentionally disturb a bat while it is occupying a structure or place which it uses for that purpose.

Most resident nesting birds are protected under the Wildlife and Countryside Act 1981, which protects birds, nests, eggs, and nestlings. Some rarer species, such as barn owls are afforded extra protection.

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**Bat and Bird Presence/Absence Survey**

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**5 ECOLOGICAL PROVISIONS**

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**Bats** - It can be concluded from the above survey results that the old bat droppings (please see Table 5 for further information) and the absence of pre-emergent flying BLE bats indicate that the roost in the loft space is no longer in use and hasn't been for several years (old bat droppings).

However, it is recommended by the LPA/Wildlife Trust (Biodiversity enhancement required under the NPPF (2021) that bat boxes be installed onto mature trees located along the east boundary of the site, and only low-level landscape lighting (if required) is installed at the site to retain the current low levels of artificial light pollution at the site/area. Please also see Appendix C: Bat and Artificial Lights, for further details about artificial light pollution and bats.

Supplier for the bat and bird boxes - <https://www.nhbs.com>

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**Bat and Bird Presence/Absence Survey**

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**Figure 7: One 2FN Schwegler Bat Box and One Vincent Pro Bat Box should be installed on the mature tree highlighted below, facing southwest and at least 5m from the ground. Branches must be removed in the area of the bat boxes to create a clear flight path in/out of the bat boxes.**



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**Bat and Bird Presence/Absence Survey**

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**Birds** – One active Jackdaw nest using the chimney stack. However, there was no evidence of current or historical nesting birds inside the loft spaces of the building.

Any works (demolition of the building) that impact any active birds' nests should be undertaken outside the bird breeding season (the breeding season is March to August).

Birds and their nests are protected under the 'Wildlife and Countryside Act 1981', making it illegal to kill, injure or destroy a bird, its chicks, or its nest. Therefore, if birds are nesting at the time of the demolition, the above time avoidance measures will need to be put in place.

It is recommended by the LPA/Wildlife Trust (Biodiversity enhancement required under the NPPF (2021) that a replacement nest box is installed onto a mature tree located along the east boundary of the site,



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Bat and Bird Presence/Absence Survey

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**Figure 8:** One Jackdaw nest box should be installed on the mature tree highlighted below, facing north and at least 5m from the ground. Branches will need to be removed in the area of the bird box to create a clear flight path in/out of the box.



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Bat and Bird Presence/Absence Survey

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## **6 SUMMARY**

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### 6.1 Bat and Bird Ecology

**Bats** - From the information obtained during the bat activity surveys, it can be established that there are no roosting bats inside the building, with no Natural England mitigation or compensation measures required to be implemented at the site. However, enhancement measures should be implemented at the site. Please see 'Section 5 – Ecological Provisions' for an outline of the proposed ecological provisions (enhancement measures) for the works at the site.

**Birds** – There is one active Jackdaw nest at the site. Please see 'Section 5 – Ecological Provisions' for an outline of the proposed ecological provisions for the works at the site.

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**Bat and Bird Presence/Absence Survey**

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**7 REFERENCES**

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- Bat Conservation Trust (2016). *Bat Surveys – Good Practice Guidelines*. 3<sup>rd</sup> Edition. Bat Conservation Trust: London.
- Berthinussen, A. & Altringham, J.D. (2012). The effect of a major road on bat diversity. *Journal of Applied Ecology* 49: p.p. 82–89.
- Biodiversity Action Reporting System (2010). *Biodiversity Action in Staffordshire*. BARS. [Online]. Available at: [http://ukbap-reporting.org.uk/plans/map\\_county.asp](http://ukbap-reporting.org.uk/plans/map_county.asp) [accessed on 20<sup>th</sup> October 2010].
- BSBI (2008). *BSBI 2007 List*. [Online]. Available at: <http://www.bsbi.org.uk/html/database.html> [accessed on 6<sup>TH</sup> January 2013].
- The Conservation of Habitats and Species Regulations 2010*. SI 2010/490.
- The Conservation (Natural Habitats, &c.) (Amendment) Regulations 2007*. SI 2007/1843, London: HMSO.
- Countryside and Rights of Way Act 2000* (c.37). London: HMSO.
- Dietz, C., von Helversen, O. & Nill, D. (2009) Bats of Britain, Europe and Northwest Africa. London: A. C. Black
- Hutson, A.M., Spitzenberger, F., Aulagnier, S., Coroiu, I., Karataş, A., Juste, J., Paunovic, M., Palmeirim, J. & Benda, P. (2008) *Pipistrellus pipistrellus*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.1
- RSPB (2002). The Population Status of Birds in the U.K. 2002-2007
- Rydell J & Racey, P A (1993). Street lamps and the feeding ecology of insectivorous bats. Recent Advances in Bat Biology, *Zool Soc Lond Symposium abstracts*.
- U.K. Biodiversity Action Plan (2007). *UK List of Priority Species*. Joint Nature Conservation Committee. [Online]. Available at: <http://www.ukbap.org.uk/NewPriorityList.aspx> [accessed on 20<sup>th</sup> October 2010].
- Wildlife and Countryside Act 1981 (and amendments)* (c.69). London: HMSO.

Bat and Bird Presence/Absence Survey

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**8 APPENDICES**

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**Appendix A:** Site Plan

**Appendix B:** Additional Photographic Records

**Appendix C:** Bats and Artificial Light

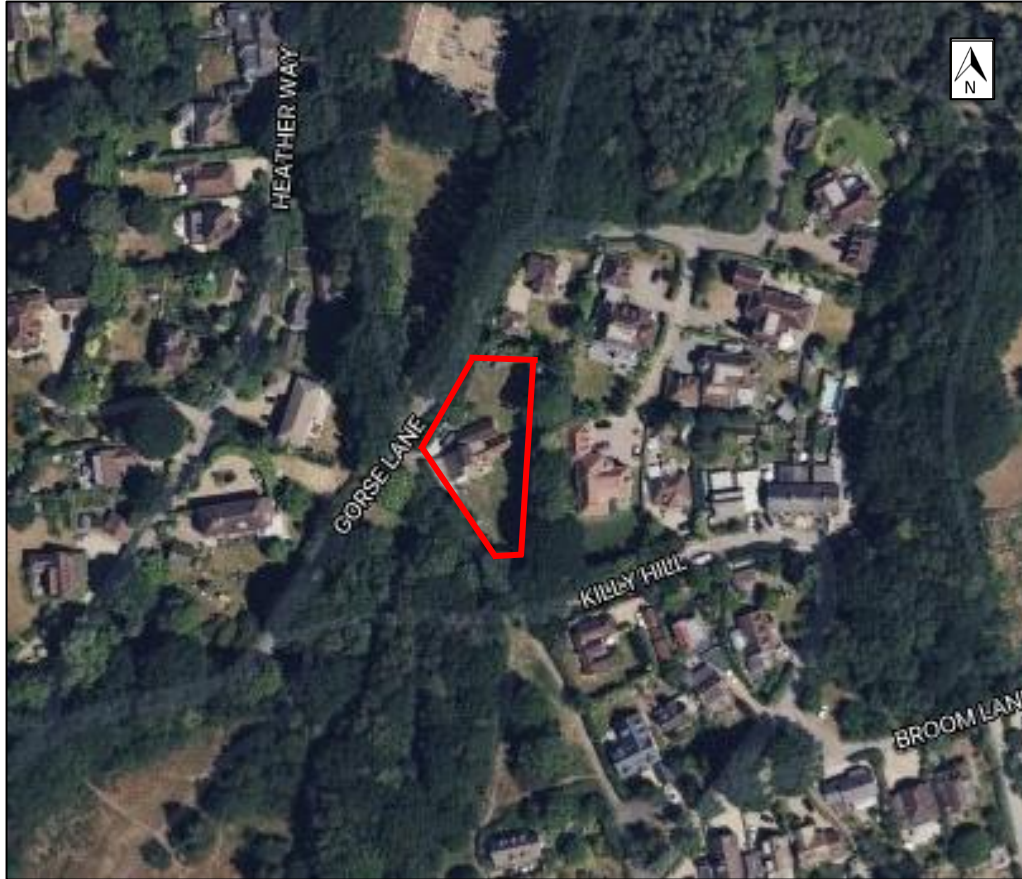
**Appendix D:** Bat Droppings DNA Results



Bat and Bird Presence/Absence Survey

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**Appendix A: Site Plan.**

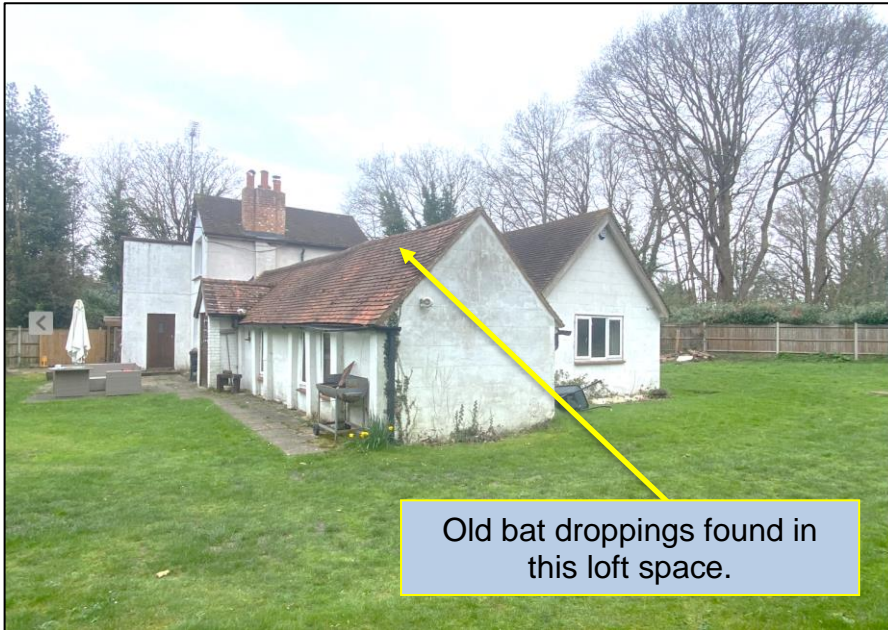


Please contact Tim Humphries ([thumphries@firstplan.co.uk](mailto:thumphries@firstplan.co.uk)) for a copy of the proposed site plans for the redevelopment of the site.

Bat and Bird Presence/Absence Survey

**Appendix B: Additional Photographic Records**

**Plate 1: A photograph of the south and east elevations of Malvern Cottage.**



**Plate 2: A photograph of the north and east elevations of Malvern Cottage.**





Bat and Bird Presence/Absence Survey

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**Plate 3:** A photograph of the south elevations of Malvern Cottage.



**Plate 4:** An internal photograph of the first accessible roof.



Bat and Bird Presence/Absence Survey

**Plates 5 and 6:** Internal photographs of the second accessible roof.





Bat and Bird Presence/Absence Survey

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**Plate 7:** Internal photograph of the third accessible roof



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## Bat and Bird Presence/Absence Survey

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### Appendix C: Bat and Artificial Lights

Artificial lighting is known to affect bat roosting and foraging behaviour, with lighting shown to result in a range of impacts, including roost desertion (BCT, 2009), delayed emergence of roosting bats (Downs et al., 2003), increased activity of some bat species and decreased activity by others (Stone et al., 2012).


An experimental approach using L.E.D. units, demonstrated that relatively fast-flying bat species, including common pipistrelle, showed no significant impacts as a result of new artificial lighting, even when lighting was set at relatively high levels close to 50 lux. In contrast, slow flying bats, including myotis bats (*Myotis* spp.) showed sharp reductions in presence, even at low light levels of 3.6 lux (Stone et al., 2012). Current recommendations for all bat species specifies that no bat roost should be directly illuminated (BCT 2014).

Mitigation and lighting design Bat-friendly lighting plans should first look to avoid lighting where possible and minimise lighting impacts by adopting the following measures:

- Lighting curfews or use of P.I.R. sensors. Lighting curfews can be an effective way of avoiding impacts on bats. These curfews may involve either turning off lighting or dimming light units at specific times of the night, dimming units at key times of the year, providing the luminaire allows for this option via a control unit. Lighting to be triggered by P.I.R. sensors can be expected to be illuminated only when required and for a low proportion of the overall time.
- Consider no lighting solutions where possible. Options such as white lining, good signage, and L.E.D. cats eyes, should be considered as preferable, especially within Zones 1 and 2. Reflective fittings may help make use of headlights to provide any necessary illumination in some areas.
- Use only high-pressure sodium, or warm white L.E.D. lamps where possible. High pressure sodium and warm white L.E.D. lamps emit lower proportions of insect attracting U.V. light than mercury, metal halide lamps, and white L.E.D. lighting. Generally, lamps should have a lower proportion of white or blue wavelengths, with a colour temperature <4200 kelvin recommended (BCT, 2014).
- Minimise the spread of light. The light spread should be kept at or near horizontal to ensure that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Baffles, hoods, louvres, and shields should be used where necessary to reduce light spill.
- Consider the height of lighting column. While downward facing bollard lighting is often preferable, it should be noted that a lower mounting height does not automatically reduce impacts to bats as bollard lighting can often be designed to provide up lighting. Where bollard lighting is considered to be the most appropriate system, bollard spacing or unit density should be kept to a minimum and units should be fitted with the appropriate hoods/deflectors to reduce up lighting Column height should be carefully considered to balance task and mitigation measures.
- Avoid reflective surfaces below lights. The polarisation of light by shiny surfaces attracts insects increasing bat activity (BCT, 2012). Consequently, surface materials around lighting require consideration.

Bat and Bird Presence/Absence Survey

**Appendix D: Bat Droppings DNA Results**



SureScreen Scientifics

Folio No: E17520  
 Report No: 1  
 Purchase Order: Malvern Cottage  
 Client: EVOLUTION ECOLOGY LTD  
 Contact: Paul Keeling

### TECHNICAL REPORT

**ANALYSIS OF BAT DROPPINGS FOR SPECIES OF ORIGIN IDENTIFICATION**

**SUMMARY**

The droppings of bats contain small amounts of DNA belonging to the organism from which they originated. By analysing droppings collected from a bat roost or colony for the presence of DNA, a robust identification of the species present can be made. Recent advancements in molecular methods including PCR (polymerase chain reaction) and DNA sequencing mean that 92% of bat species worldwide can be identified including all 17 UK resident bat species.

**RESULTS**


**Date sample received at Laboratory:** 19/05/2023  
**Date Reported:** 31/05/2023  
**Matters Affecting Results:** None

Lab Sample ID.	Site Name	O/S Reference	Genetic Sequence	Common Name	Result	Sequence Similarity
B1830	Malvern House	SU 97020 263087	TAATCCGAGGCTTCGGGNN FGATGTGGCCACTAATAAT JGGAGCCCTGATATAGCTT TTCCCGAATAAATAACATA AGCTTCTGACTGCTTCCCC ATCTTTCGACTACTTTTACG TTCCCTGCGACTAGAGGCTG GAGCAGGTACCCGTTGAACA GTCTATCTTCTTTCAGCGGG AAACTAGCCACGCCAGGAG A	Brown long-eared bat	<i>Plecotus auritus</i>	98.94%

If you have any questions regarding results, please contact us: [ForensicEcology@surescreen.com](mailto:ForensicEcology@surescreen.com)

**Reported by:** Jennifer Higginbottom

**Approved by:** Gabriela Danickova



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 UK Tel: +44 (0)1332 292003 Email: [scientifics@surescreen.com](mailto:scientifics@surescreen.com)  
 Company Registration No. 08950940

Page 1 of 2

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## Bat and Bird Presence/Absence Survey

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### **METHODOLOGY**

Once samples have arrived in the laboratory, a single bat dropping is selected for its suitability (freshness and size). The DNA is then isolated using a commercial DNA extraction kit. Using PCR, bat DNA (if present within the sample) is amplified using bat DNA-specific molecular markers designed to amplify a short fragment of the mitochondrial gene. If amplification is successful, the resulting DNA sequence is revealed using a process known as Sanger Sequencing in order to obtain the genetic sequence. The sequence results are aligned against a library of known bat reference sequences using bioinformatics software, which enables us to determine which species the extracted DNA matches with, informing the species identity and sequence similarity (%).

If the initial analysis is unsuccessful, the entire process is repeated up to two additional times with fresh reserve droppings. If no DNA is detected after three attempts, we can be confident that any further analysis of the sample will likely also fail to result in species identification.

### **INTERPRETATION**

<b>Genetic Sequence:</b>	The unique DNA sequence obtained from the sample.
<b>Sequence Similarity:</b>	How closely matched the DNA sequence from your sample is to the sequences within our reference database. This can be interpreted as a score of result accuracy, with the maximum score of 100% indicating an exact match of dropping to the indicated species' reference sequence. Lower scores (80-99%) indicate some variation between the sample and reference sequence, likely due to natural variation between individual genetic sequences and/or systematic variations generated through the sequencing process. Scores below 80% similarity should be interpreted with care and can indicate part degraded or part contaminated samples.
<b>Inconclusive Result:</b>	<p><b>Degraded sample:</b> DNA degraded, unable to determine species identification due to degradation of sample DNA. This can happen either before sample collection (old droppings, exposure to UV etc.) or after sample collection if stored for long periods before analysis or not handled correctly.</p> <p><b>Inhibited/contaminated sample:</b> Unable to determine species identity due to contamination or the suspected presence of large quantities of PCR inhibitors. Contamination sources can come from other species which come into contact with droppings, human contamination during sample collection.</p>
<b>Alternative Result:</b>	Sometimes, other mammalian species such as rodents are detected. We find this to be a common occurrence as some bat droppings can be similar in appearance to rodent droppings. Although sometimes unexpected, repeat analyses in these cases would likely return the same results.





Bat and Bird Presence/Absence Survey

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**The Bat-Year**



**January** Hibernating; using up fat reserves.



**February** Still hibernating; few fat reserves left.



**March** Some activity; occasional bat seen feeding.



**April** Awake and feeding at night.



**May** Females looking for nursery sites.



**June** Young born usually only one.

Bat and Bird Presence/Absence Survey

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**July** Young still suckling.



**August** Young start catching insects; females leave the nursery to find males.



**September** Mating season begins; start building fat reserves for hibernation.



**October** Search for suitable hibernation site.



**November** Hibernation begins although still some activity in warm weather.



**December** Hibernating.

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**Bat and Bird Presence/Absence Survey**

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**9 LIMITING CONDITIONS/DISCLAIMERS (Unless stated otherwise)**

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**9.1 The Service**

9.2 Evolution Ecology agrees to supply ecological consulting services of a preliminary nature or a more thorough service as advised or as commissioned.

**10 Fees**

10.1 The client(s) will settle the agreed fee in full, within 30 days of receiving the invoice. Reports will remain the property of Evolution Ecology until full payment has been received. No liability is accepted for the contents of a report that is not paid in full. Any queries should be notified to Evolution Ecology within 7 days of the invoice date.

10.2 If the client(s) fails to pay within the time specified in 2.1 then Evolution Ecology shall charge the client(s) interest on the outstanding fee, both before and after any judgment, at the rate of 4% per annum above the HSBC Bank base rate, until payment is made in full (A part of a month being treated as a full month for the purposes of calculating interest).

10.3 In the event that it is necessary to recover any outstanding fees from the client(s), the client(s) will fully reimburse any costs and expenses incurred during the recovery period, including court costs. Evolution Ecology reserves the right to make a charge for every letter sent and telephone/fax call made, in connection with the recovery.

**11 The Report**

11.1 If any part of the report is lost, or altered without the written consent of Evolution Ecology, then the entire report becomes invalid.

11.2 The general format of reports is a certified product and cannot be shown, copied or distributed to third parties without the permission of Evolution Ecology. No liability is accepted for the contents of the report, other than to that of the client(s).

11.3 The report will purport not to express any opinion or comment as to the condition or structural integrity of any building and no reliance should be made on any such comments.

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Bat and Bird Presence/Absence Survey

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**12.1 Insurance Cover**

12.2 All work carried out by Evolution Ecology is covered by a £1,000,000 professional indemnity insurance.

**13.1 Quality of Craftsmanship**

13.2 When appointing an Ecologist, please use only suitably qualified and experienced companies (The Local Authority and the Institute of Ecology and Environmental Managers may be able to provide a select list of such companies)

13.3 Evolution Ecology will not accept liability for any works undertaken by any other companies, or contractors.