



# Quaker's Yard, Treharris Bat Roost Survey Report

August 2023

Englobe





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August 2023

## Englobe

Version	Date	Author	Checked	Approved
Final	24/10/2023	T Adcock	C Cartwright	J Wilson

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# 1.0 Introduction

## Background

- 1.1 Keystone Ecology was instructed by Englobe to undertake an update Bat Roost Inspection Survey (BRIS) and Bat Roost Presence/Absence survey of trees on and within 20 metres from a former gas works site at Quaker's Yard in Treharris, South Wales (central grid reference ST09820 96670).
- 1.2 The surveys were required to update the findings of an initial BRIS carried out in 2022 (Keystone Ecology, 2022a), which was completed prior to ash dieback clearance undertaken by the Local Authority. The survey was requested by the Local Planning Authority ecologist who had since observed potential bat features on trees that had been either subject to arboricultural works or had been recently exposed following clearance of a previously dense understory.
- 1.3 The survey is required to ensure legal compliance during site investigations and to inform a planning application for remediation works, which will require full site clearance as well as works to the adjacent riverbanks.

## Aims and Objectives

- 1.4 The aim of the survey was to ascertain the following:
  - Presence/absence of bat roosts;
  - Status of roosts, if present;
  - Whether additional surveys are required;
  - Whether a European Protected Species (EPS) licence is required to ensure legal compliance; and
  - Which type of mitigation measures would need to be employed (if any).

## Site Characteristics

- 1.5 The 0.57 hectare site comprises deciduous woodland. The River Taff Bargoed delineates the southern boundary of the site whilst the northern, eastern and western boundaries are contiguous with adjacent areas of broad-leaved woodland. A public footpath bisects the site and connects the small residential town of Treharris in the north with Mill Street in the south. This hardstanding footpath will also form the site access route. Stone walls, overgrown with vegetation and small structural remains of the former gas works are scattered throughout the site. All other features of the gas works have been demolished and foundations are obscured by ground flora.
- 1.6 The site is located on the southern outskirts of Treharris, in South Wales. The wider landscape is characterised by small residential villages and communities including Nelson, Abercynon and Trelewis, surrounded by areas of pasture and woodland. The River Taff

Bargoed flows north-east to south-west and converges with the River Taff approximately 300 metres to the south of the site.

## Legislation, Planning Context and Status<sup>1</sup>

### *Protection Legislation*

- 1.7 All UK bat species are protected under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (the Habitats Regulations), and as such receive protection under Regulation 42. All UK bat species are also listed in Schedule 5 of The Wildlife and Countryside Act 1981 and, therefore, receive protection under Section 9 of this Act (as amended by the Countryside and Rights of Way Act 2000).
- 1.8 This legislation makes it an offence to:
- Deliberately capture or kill a bat;
  - Deliberately disturb<sup>2</sup> a bat;
  - Intentionally or recklessly disturb<sup>3</sup> a bat;
  - Intentionally or recklessly obstruct access to any structure or place a bat uses for shelter or protection; and
  - Damage or destroy a breeding site or resting place of a bat.
- 1.9 In the case of *Vivienne Morge vs. Hampshire County Council* (2010), the Supreme Court has defined deliberate disturbance as ‘an intentional act knowing that it will or may have a particular consequence, namely disturbance of the relevant protected species.’
- 1.10 Since 2007 it is no longer a valid defence to show that the killing, capture or disturbance of a species covered by the Habitats Regulations or the destruction or damage of their breeding sites or resting places was the incidental and unavoidable result of an otherwise lawful activity.
- 1.11 EPS licences can be granted by Natural England in respect of development to permit activities that would otherwise be unlawful under the Habitats Regulations, providing that the following 3 tests (set out in the EC Habitats Directive) are passed:
- The development is for reasons of overriding public interest;
  - There is no satisfactory alternative; and
  - The favourable conservation status of the species concerned will be maintained and/or enhanced.

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<sup>1</sup>Please note that this legal information is a summary and intended for general guidance only. The original legal documents should be consulted for definitive information. Web addresses providing access to the full text of these documents are given in the References Section.

### *Protection Afforded by the Planning System*

1.12 The National Planning Policy Framework (NPPF) sets out government policy regarding consideration of biodiversity in planning decisions. Under the NPPF the presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat.

1.13 The NPPF states that:

*'When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:*

- *if significant harm 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;*
- *proposed development on land within or outside a Site of Special Scientific Interest (SSSI) likely to have an adverse effect on a SSSI (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of SSSIs;*
- *development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;*
- *opportunities to incorporate biodiversity in and around developments should be encouraged;*
- *the following wildlife sites should be given the same protection as European sites: potential Special Protection Areas (SPA) and possible Special Areas of Conservation (SAC); listed or proposed Ramsar sites; and sites identified, or required, as compensatory measures for adverse effects on European sites, potential SPAs, possible SACs, and listed or proposed Ramsar sites.'*

1.14 Section 40 of the Natural Environment and Rural Communities Act 2006 (the NERC Act) places a legal duty on public bodies, including planning authorities, to *'from time to time consider what action the authority can properly take, consistently with the proper exercise of its functions, to further the general biodiversity objective'* (section 40(1)). The 'general biodiversity objective' is defined as *'the conservation and enhancement of biodiversity in England through the exercise of functions in relation to England'*. Section 40(2A) also requires that public bodies *'have regard to – (a) any relevant local nature recovery strategy, and (b) any relevant species conservation strategy or protected site strategy prepared by Natural England'*.

1.15 In compliance with Section 41 of the NERC Act, the Secretary of State has published a list of species and habitats considered to be of principal importance for conserving biodiversity in England under the UK Post-2010 Biodiversity Framework. This is referred to as the list of Species/Habitats of Principal Importance in England, of which there are 56 habitats (HPI) and

943 species (SPI). The list is used to guide planning authorities in implementing their duty under the NERC Act.

1.16 Seven bat species are SPI. These are:

- Barbastelle Bat;
- Bechstein's Bat;
- Noctule Bat;
- Soprano Pipistrelle Bat;
- Brown Long-eared Bat;
- Greater Horseshoe Bat; and
- Lesser Horseshoe Bat.

1.17 The following bats species are also identified in the Merthyr Tydfil Biodiversity Action Plan (Merthyr Tydfil Biodiversity Partnership, 2014):

- Bechstein's Bat;
- Noctule Bat;
- Soprano Pipistrelle Bat;
- Brown Long-eared Bat;
- Greater Horseshoe Bat; and
- Lesser Horseshoe Bat.

1.18 Under Regulation 9(3) of the Habitats Regulations, Planning Authorities also have a legal duty to 'have regard to the requirements of the Habitats Directive in the exercise of their functions.' As demonstrated by the case of Woolley vs. Cheshire East Borough Council and Millennium Estates Ltd (2009), this means that they must consider the three Habitats Directive tests (see above) when determining whether Planning Permission should be granted for developments likely to cause an offence under the Habitats Regulations. As a consequence, Planning Applications for such developments must demonstrate that the three tests will be passed.

## 2.0 Methodology

### Desk Study

- 2.1 As part of a Preliminary Ecological Appraisal carried out by Keystone Ecology (Keystone Ecology, 2022b), the South-east Wales Biodiversity Records Centre (SEWBRc) was contacted for records of bats, bat roosts and non-statutory sites designated for bats within 2 kilometres from the site.
- 2.2 Web-resources (Natural England, 2016; Gov.uk 2016) were also searched for any European statutory sites designated for bats on site and within a 15 kilometres radius from the site boundary and any national statutory sites designated for bats on site and within a 10 kilometres radius of the site.

### Updated BRIS

- 2.3 All trees on site were surveyed on 5<sup>th</sup> July 2023 by Jack Howell (BSc (Hons)) ACIEEM who satisfies all necessary field survey competencies as set out by the CIEEM. Tree locations are shown on Figure 1.
- 2.4 With reference to current survey guidelines (Chapter 6 of Collins, 2016), trees were visually inspected from the ground (with the aid of binoculars) to search for potential roost features (PRFs) and signs of use by bats, such as:
  - Natural holes, woodpecker holes, cracks/splits in major limbs, loose bark, hollows/cavities, dense epicormic growth, Ivy clad limbs/trunk, bird and bat boxes;
  - Tiny scratches, presence of flies and/or staining around entry point;
  - Bat droppings in, around or below entrance;
  - Audible squeaking at dusk or in warm weather;
  - Distinctive smell of bats; and
  - Smoothing of surfaces around the cavity.
- 2.5 In the absence of any evidence, trees have been assigned a rating of suitability from negligible to high potential for supporting bats (as set out in Table 4.1 of Collins (2016)). The rating is based primarily on the location of the tree in the wider landscape (proximity to suitable foraging habitats and/or commuting routes) and the number and type of PRFs suitable for use by bats.

### Presence Absence Survey

- 2.6 With reference to best practice guidelines, up-to-date at the time of the survey (i.e., Collins 2016), the survey season for bats is between May and September inclusive, and for trees with moderate or high roost potential, at least one to two survey visits respectively should be completed between May and August inclusive (Collins 2016).

- 2.7 Collins 2016 advises that up to three survey visits are required to confirm the presence/absence of a bat roost, and for trees of moderate to high potential value, at least one survey visit should be a dawn re-entry survey. However, an interim guidance note produced by The Bat Conservation Trust (BCT, 2022) in advance of the publication of the 4th edition of the bat survey guidelines, clarifies that the 4th edition of the guidelines will transition away from the standard use of dawn surveys in favour of dusk surveys supported by thermal imaging cameras.
- 2.8 In addition, dusk survey visits can be replaced by endoscope inspections, as described below, if potential roost features can be fully inspected to confirm the presence/absence of a bat roost with confidence.
- 2.9 Therefore, dusk and endoscope surveys of moderate and high value trees were carried out on the 17<sup>th</sup> July and 8<sup>th</sup> August. Dusk surveys were undertaken for all trees or features that could not be fully inspected using an endoscope. Survey dates and times are provided in Table 1 below. Weather conditions recorded during the survey visits are provided at Appendix 1.

**Table 1: Survey Timing**

Survey Type	Date	Sunset/Sunrise	Start Time	End Time
Dusk	17/07/2023	21:25	20:55	22:55
Dusk	08/08/2023	20:52	20:22	22:22

- 2.10 The dusk survey visits were led by a suitably experienced ecologist (Jack Howell (BSc (Hons)) ACIEEM) who satisfies all necessary field survey competencies as set out by the Chartered Institute for Ecology and Environmental Management (CIEEM). The endoscope inspections were also carried out by Jack Howell (BSc (Hons)) ACIEEM, who is accredited under Natural Resources Wales bat licence S092169/1.
- 2.11 During each dusk survey visit, two surveyors were strategically positioned around each tree so as to be able to monitor all potential roost egress points identified during the update BRIS. The camera locations are shown on Figure 2, and screenshots of the camera view can be seen at Appendix 4.
- 2.12 The surveyors were equipped with infra-red cameras paired with a Song Meter SM4BAT-ZC automated bat detector recording unit (Wildlife Acoustics Inc., Concord, MA).
- 2.13 Bat echolocation calls were saved onto digital audio recorders. Where it was not possible to identify a bat to species level on site, the audio recordings were later analysed using Waversurfer sound analysis software (Version: 1.8.8p4, 2011, Jonas Beskow and Kare Sjolander)/Kaleidoscope Pro software version 5.5.0 (Wildlife Acoustics), to identify the bat species, as far as possible.
- 2.14 Any footage recorded by the infra-red cameras was later analysed using Windows Media Player (version 3.0.18, VideoLAN), to confirm if a bat had emerged or re-entered the tree and identify any roosting bats that surveyors may not have seen during the survey.

- 2.15 During the endoscope survey, each potential roost feature was inspected either from the ground or from a ladder where possible. In the event bats or evidence of bats was identified, photo or video evidence was gathered using the endoscope. ...

### **Nomenclature**

- 2.16 Common names for species are provided in this report. Names of vascular plants and Charophytes follow the nomenclature of The Botanical Society for the British Isles database (2007), all other flora and fauna follow the UK Species Inventory (Natural History Museum, 2016).

### **Limitations of Survey Methodology**

- 2.17 A summary of the limitations of the survey methods, and implications of these with regard to survey effectiveness are provided below. Where the implications have been assessed elsewhere in this report, reference to the relevant section of the report is provided.

#### *Desk Study*

- 2.18 The accuracy of data held by consultees varies due to the quality and scale that they were digitised to, the supporting information used to define locations/boundaries, and the sensitivity of the data itself. Keystone Ecology cannot take responsibility for the accuracy of external data sources and as such, discrepancies and inaccuracies may occur. In addition, the data held by consultees may not be exhaustive. The absence of records does not necessarily indicate the absence of a species/habitat, from but rather that these have not been recorded or are perhaps under-recorded in the area. Therefore, when assessing the potential value of the area for bat species, the desk study data has been considered as evidence of potential presence only.

#### *Field Survey*

- 2.19 The results of the field survey and assessment work undertaken by Keystone Ecology are representative at the time of surveying.
- 2.20 Keystone Ecology staff and their sub-consultants endeavour to identify the presence of protected species wherever possible on site, where this falls within the agreed scope of works.
- 2.21 Up to date standard methodologies have been used, which are accepted by Natural Resources Wales and other statutory conservation bodies. No responsibility will be accepted where these methodologies fail to identify all species on site. Keystone Ecology cannot take responsibility where Government, national bodies or industry subsequently modify standards.
- 2.22 Once light levels drop below a given point, it is possible to miss bats emerging from egress points. While every effort is made to detect emerging bats, it cannot be guaranteed that all emerging bats will be detected. Therefore, infra-red cameras were used to ensure that roosting bats are not missed, thereby preventing this limitation from impacting the survey effectiveness.

- 2.23 It should be noted that brown long-eared bats in particular echolocate more quietly, and horseshoe bat species in particular echolocate more directionally, compared to other bat species and so can sometimes be more difficult to detect and often go unrecorded. Species from the *Myotis* and *Nyctalus* genera are notoriously difficult to distinguish in the field and from recorded sonograms, as there is considerable overlap in their range of echolocation frequencies. Where the species cannot be determined only the genus is stated.

## 3.0 Results and Assessment

### Desk Study

- 3.1 There are no European statutory sites designated for bats within 15 kilometres, no national statutory sites designated for bats within 10 kilometres, and no non-statutory sites designated for bats within 2 kilometres from the site.
- 3.2 There are records of at least three bat species roosting within 2 kilometres from the site and records of five bat species otherwise occurring within 2 kilometres from the site. Details are provided below in Table 2.

**Table 2: Bat Records within 2 Kilometres from the Site**

Species	Roost records (No. of Records / Closest Minimum Distance from Proposed Development Site (m))	Other records (No. of Records / Closest Minimum Distance from Proposed Development Site (m))
Brown Long-eared Bat	(7/511)	-
Common Pipistrelle Bat	(2/250)	-
Soprano Pipistrelle Bat	(2/940)	-
Brandt's Bat	-	(1/1,914)
Daubenton's Bat	-	(4/862)
Nathusius's Pipistrelle Bat	-	(1/1,712)
Noctule Bat	-	(8/115)
Serotine Bat	-	(1,719)

### Updated BRIS

- 3.3 During the course of the survey, eight trees and one tree group (Group 1) were surveyed on and within 20 metres from the site boundary (inclusive of the site access route). Species were ash, willow, hazel, sycamore and pedunculate oak. The results of the tree survey are summarised in Table 3. Tree locations are shown on Figure 1. Refer to Appendix 3 for detailed descriptions of each tree/tree group and their PRFs.

**Table 3: Summary of Tree Survey Results**

<b>Roost Potential</b>	<b>Total Number of Trees/Tree Groups in Category</b>	<b>Tree/Group Number (Figure 1)</b>
High/Confirmed	-	-
Moderate	4 trees	A, C, E, H
Low	2 trees	B, F
Negligible	2 trees, 1 group	D, G and Group 1

### **Field Survey**

- 3.4 It was possible to fully inspect PRFs in trees A, C and F by endoscope; however, it was not possible to fully inspect trees E and H (Figure 1). Therefore, the survey comprised two dusk emergence visits to moderate value trees E and H, two endoscope inspections of moderate trees A and C, and one endoscope inspection of low value trees B and F, during the main bat activity season (see Table 1), with reference to good practice guidelines (Collins, 2016).
- 3.5 No bats or signs of bats were recorded either during the endoscope inspections, or the dusk emergence survey visits.
- 3.6 Occasional common pipistrelle bats were observed commuting and foraging along the River Bargoed Taff corridor.

## 4.0 Impacts

- 4.1 The site will be cleared of vegetation and remaining hard-standing or remains of built structures, resulting in the loss of four trees (A, C, E and H, Figure 1) with moderate potential to support roosting bats, and two trees with low potential to support roosting bats (B and F, Figure 1). Bats roosts have been shown to be likely absent; therefore, no impacts to roosting bats are predicted.
- 4.2 However, considering the potential value to roosting bats of the trees to be felled, there is a minor risk of disturbing, killing or injuring any bats that might be present at the time of the works.
- 4.3 No impacts to roosting bats are predicted as a result of the loss of trees D, G or Group 1, given their negligible potential for roosting bats.

## 5.0 Recommendations and Requirements

### Further Survey

- 5.1 Further surveys would only be required if the works were delayed for a year or more. If this were to be the case, a repeat Bat Roost Inspection Survey and potentially repeat Presence/Absence and/or Roost Characterisation Surveys would be required before works commence, to confirm that the status of the site remains as that described in this report, or the implications of any potential change in value to roosting bats.

### Legal Compliance

- 5.2 Based on the results of these surveys, an EPS licence will not be required in order to proceed with the proposed works (within the time-scale referred to above).

### Mitigation

#### *Provision for Bats*

- 5.3 In order to compensate for the loss of potential roost features in four moderate potential and two low potential trees, 6 x Schwegler 2F bat boxes should be installed on retained mature trees along the site perimeter following the completion of works on site. Boxes should be installed in groups of three to help improve the probability of use.

#### *Care and Vigilance during Works*

- 5.4 In respect of those trees where surveys have demonstrated a likely absence of bats, it should be noted that due to the transient nature of bat roosts it is possible that crevice-dwelling bats (e.g., pipistrelle bat spp.), could utilise unidentified roosts beyond the date of the surveys. The contractor(s) should therefore be advised to carry out all work with care and vigilance for bats.
- 5.5 It is recommended that trees with potential to support roosting bats be 'soft felled'. This is a generic term used to describe more cautious felling approaches, using lowering and cushioning techniques to reduce the impact of felling limbs, which may still have bats within the cavities. Limbs with cavities should be left at the base of the tree, free from potential obstructions to the exit route, for at least 24 hours before removal from the site.
- 5.6 When removing trees or undertaking tree surgery works, the following procedures should be employed in the event that any bats are discovered:
- If the roost is still on the tree and bats are not injured, seek advice from Natural England or a suitably experienced ecologist. If help is not available, allow bats to fly out of harm's way;
  - If the timber is felled, the roost is not exposed and the bats are not injured, seek advice from Natural Resources Wales or a suitably experienced ecologist. If advice is not readily available, position the roost off the ground, and allow bats to relocate of their own accord;

- If the roost has been exposed, contact Natural Resources Wales or a suitably experienced ecologist; and
- Note the date, locality, type of tree, situation in tree and bat species if known.

## 6.0 References

Bat Conservation Trust (2022). *Interim Guidance Note: Use of night vision aids for bat emergence surveys and further comment on dawn surveys*. Available at: <https://cdn.bats.org.uk/uploads/pdf/Interim-guidance-note-on-NVAs-May-2022-FINAL.pdf?v=1653399882> [Accessed 17<sup>th</sup> October 2023]

Botanical Society for the British Isles (2007). *BSBI 2007 List*. Available at: <http://www.bsbi.org.uk/taxonomy.html> [Accessed on 17th October 2023].

Collins, J. (Ed.) (2016). *Bat Surveys for Professional Ecologists - Good Practice Guidelines (3<sup>rd</sup> Edition)*. Bat Conservation Trust: London.

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Keystone Ecology (2022a). *Bat Roost Inspection Survey – Quakers Yard, Treharris*. Keystone Ecology: Tetbury.

Keystone Ecology (2022b). *Preliminary Ecological Appraisal – Quakers Yard, Treharris*. Keystone Ecology: Tetbury.

Merthyr Tydfil Biodiversity Partnership (2014) *Action for Wildlife in Merthyr Tydfil - The Merthyr Tydfil Biodiversity Action Plan*. Available at: <https://www.merthyr.gov.uk/resident/planning-and-building-control/countryside-and-natural-environment/countryside-management-projects/> [Accessed on 17<sup>th</sup> October 2023]

Natural England (2016). *Natural England GIS Digital Boundary Database*. Available at: <https://naturalengland-defra.opendata.arcgis.com/> [Accessed on 17<sup>th</sup> October 2023].

Natural History Museum (2016). *UK Species Inventory*. Available at: <http://www.nhm.ac.uk/research-curation/scientific-resources/biodiversity/uk-biodiversity/uk-species/index.html> [Accessed on 17th October 2023].

Welsh Government (2023). *DataMapWales – Data and maps from the Welsh public sector*. Available at: [Home | DataMapWales \(gov.wales\)](https://gov.wales) [Accessed on 17th October 2023].

Wray, S., Wells, D., Long, E. and Mitchell-Jones, T. (2010). *EclA: Specific Issues Associated with Bats*. Presentation at the Mammal Society/Zoological Society of London/IEEM Symposium on Advances in EclA for Mammals.

### Web Addresses for Access to Full Legislation and Policy Text:

Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019  
<https://www.legislation.gov.uk/ukdsi/2019/9780111176573>

Countryside and Rights of Way Act 2000:  
<http://www.legislation.gov.uk/ukpga/2000/37/contents>

Habitats Directive:

[http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index\\_en.htm](http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm)

National Planning Policy Framework:

<http://www.communities.gov.uk/documents/planningandbuilding/pdf/2116950.pdf>

Natural Environment and Rural Communities Act 2006:

<http://www.legislation.gov.uk/ukpga/2006/16/contents>

UK Post-2010 Biodiversity Framework:

<http://jncc.defra.gov.uk/page-6189>

Wildlife and Countryside Act 1981:

<http://www.legislation.gov.uk/ukpga/1981/69>

# Plans



- Key**
- Site boundary
  - Footpath
  - Area surveyed for bat roost potential - 20m from the path
- Individual tree bat roost potential (Collins, 2016)
- Moderate
  - Low
  - Negligible
- Grouped tree bat roost potential (Collins, 2016)
- Negligible



Englobe  
 Quakers Yard, Treharris  
 Drawing Number: 223340/17/dwg1  
 Figure 1: Updated Bat Roost Inspection Survey Results

Revision	Date	Drawn	Approved
rev0	25/10/2023	MM	TA



No dimensions to be scaled from this drawing  
 All dimensions are to be checked on site  
 Measurements displayed are for indicative purposes only



Key

- Site boundary
- Trees subject to further survey
- Fully endoscoped
- Moderate trees subject to 2 evening emergence surveys
- ⊗ Night vision aid position (viewshed indicated)

No bats or evidence of bat roosts was found during the endoscoping or presence/absence surveys.



Englobe

Quakers Yard, Treharris

Drawing Number: 223340/17/dwg2

Figure 2: Bat Roost Presence/Absence Survey Results

Revision	Date	Drawn	Approved
rev0	25/10/2023	MM	TA



No dimensions to be scaled from this drawing.  
All dimensions are to be checked on site.  
Measurements displayed are for indicative purposes only.

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# Appendices

# Appendix 1

## Survey Weather Conditions

Keystone Ecology

Quakers Yard, Treharris

Bat Roost Characterisation Survey 2023

Weather Conditions at Start of Survey

Date	Temp (°C)	Wind Speed	Wind Direction	Cloud Cover (%)	Precipitation
19/07/23	19	None	-	30	Dry
08/08/23	17	None	-	50	Dry

Weather Conditions at End of Survey

Date	Temp (°C)	Wind Speed	Wind Direction	Cloud Cover (%)	Precipitation
19/07/23	19	None	-	30	Dry
08/08/23	17	None	-	50	Dry

Time of Sunset/Sunrise

Date	Sunset/Sunrise
19/07/23	21:25
08/08/23	20:52

## Appendix 2

(From Wray *et al.*, 2010)

Rarity within Range	England	Wales	Scotland	Northern Ireland
Common (population over 100,000)	Common Pipistrelle Bat Soprano Pipistrelle Bat Brown Long-eared Bat	Common Pipistrelle Bat Soprano Pipistrelle Bat	Common Pipistrelle Bat Soprano Pipistrelle Bat	Common Pipistrelle Bat Soprano Pipistrelle Bat
Rarer (population 10,000 - 100,000)	Lesser Horseshoe Bat Whiskered Bat Brandt's Bat Daubenton's Bat Natterer's Bat Leisler's Bat Noctule Bat Nathusius' Pipistrelle Bat Serotine Bat	Lesser Horseshoe Bat Daubenton's Bat Natterer's Bat Brown Long-eared Bat	Daubenton's Bat Natterer's Bat Brown Long-eared Bat	Daubenton's Bat Natterer's Bat Leisler's Bat Nathusius' Pipistrelle Bat Brown Long-eared Bat
Rarest (population under 10,000)	Greater Horseshoe Bat Bechstein's Bat Mouse-eared Bat Greater Mouse-eared Bat Barbastelle Bat Grey Long-eared Bat	Greater Horse-shoe Bat Whiskered Bat Brandt's Bat Bechstein's Bat Mouse-eared Bat Noctule Bat Nathusius' Pipistrelle Bat Serotine Bat Barbastelle Bat	Whiskered Bat Brandt's Bat Mouse-eared Bat Noctule Bat Nathusius' Pipistrelle Bat Leisler's Bat	Whiskered Bat

## Appendix 3

### Updated BRIS

Tree reference. (Figure 1)	Tree species	Description	Potential Value (Collins, 2016)
A	Hazel	Damage on front limb largely open to the light and elements, apart from at the top where a small hole extends 8 cm into the tree, which could be used by an individual bat.  Feature on back stem extends back slightly further and wider. Ivy and fallen twigs cluttered/obscured flight entry.	Moderate
B	Goat Willow	Ivy covering, no features visible on tree. Ivy not dense enough or plate like to form a suitably sheltered feature in itself.	Low
C	Goat Willow	Rot hole at base does not extend back more than 1.5 cm. Other rot holes are superficial scars approximately 1 cm deep at most.  However, rot hole at split extends back 20 cm, fairly narrow and likely water would drain into it.	Moderate
D	Goat Willow	Small shallow split in tree. Does not extend into tree. No crevices or folds in the split. From ground level, the shadow makes it look deeper than it is	Negligible
E	Goat Willow	Rot hole at 2 m does not extend back into tree. Lowest hole does not extend back. Hole at waist height (approx. 80 cm above ground level) extends back approximately 2 inches and can be fully inspected. Features at 7m+ could provide potential for a small number of separately roosting individual bats.	Moderate
F	Alder	Ivy is lifted from bark with features open to light. Potential to use opportunistically.	Low
G	Alder	Feature does not extend back. Surface scar only.	Negligible
H	Ash	Ivy plates form crevices and small voids; however, majority are open to light and weather. Potential for a small number of separately roosting individual bats.	Moderate

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<b>Tree reference.</b> (Figure 1)	<b>Tree species</b>	<b>Description</b>	<b>Potential Value</b> (Collins, 2016)
G1	Ash, Alder, Sycamore, Goat Willow, Hazel	All other trees and understory on site.	Negligible

## Appendix 4

### Camera Screenshots

Tree H daytime:



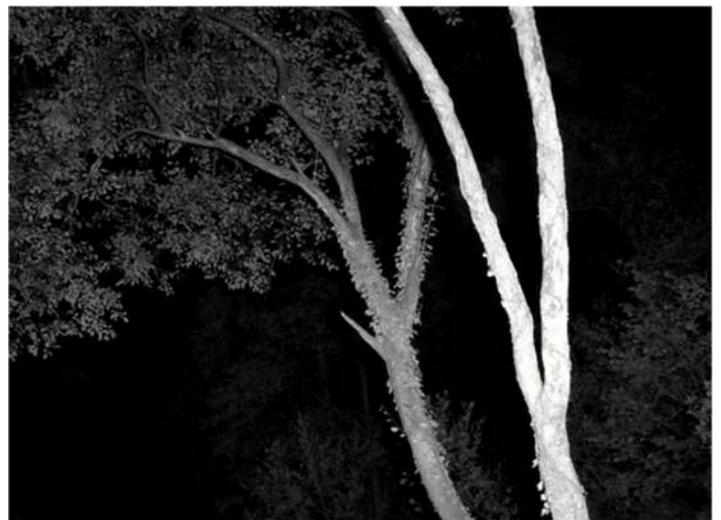
Tree E daytime:



Tree H infrared:



Tree E infrared:



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