Technical Appendix 1: Results of Bat Surveys

Wooley Colliery, Darton

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1	10 February 2025	Aaron Bailey	Tom Redman	Tom Redman

Basis of Report

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1.0 Introduction

SLR Consulting Limited (SLR) was instructed by Gleeson Developments Limited to undertake bat surveys for land at Woolley Colliery, Darton, Barnsley, S75 5RR (central ordnance survey grid reference (OSGR): SE 31039 10756).

This report presents the findings of the bat surveys undertaken in 2024 within the redline boundary of the development (split into 'Northern Site' and 'Southern Site') and the surrounding habitats within the land parcel, which form the proposed 'Biodiversity Offsetting Area'. These areas combined are hereafter referred to as the 'Survey Area'. Maps illustrating the Survey Area boundary, survey locations, and survey results are provided in Figures 1 to 3.

The aim of the surveys was to identify the assemblage of bats using the Site and any important ecological features (IEF) for bats on Site.

The assessment of impacts resulting from the proposed development and the development of mitigation measures, if required, would be covered separately within an Ecological Impact Assessment (EcIA).

1.1 Relevant Legislation and Planning Policy

All species of native bat are listed on Annex IV (with several species also on Annex II) of the EU Habitats Directive[1]. This Directive is transposed into UK law through The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations) (as amended)[2].

All species of native bat are listed on Schedule 5 of the Wildlife & Countryside Act 1981 (as amended)[3].

These pieces of legislation combine to give substantial protection to bats and their resting places. In summary, it is an offence to:

- Deliberately kill, injure or take a bat;
- Deliberately disturb a bat or bats in such a way as to be likely to impair their ability to survive, breed, or rear or nurture their young; to hibernate or migrate; or to affect significantly the local distribution or abundance of that species;
- Damage or destroy the breeding or resting place of a bat;
- Intentionally or recklessly obstruct access to a place that bats use for shelter or protection; and
- Intentionally or recklessly disturb a bat occupying a place which it uses for shelter or protection.

Additionally, several native bat species are listed a Species of Principal Importance (SPI) under Section 41 of the Natural Environment & Rural Communities Act (NERC) 2006[4]. These species are barbastelle (*Barbastella barbastella*), Bechstein's bat (*Myotis bechsteinii*), noctule (*Nyctalus noctula*), soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared bat (*Plecotus auritus*), greater horseshoe (*Rhinolophus ferrumequinum*), and lesser horseshoe *(Rhinolophus hipposideros*).

[1] https://environment.ec.europa.eu/topics/nature-and-biodiversity/habitats-directive_en

[2] https://www.legislation.gov.uk/uksi/2017/1012/contents

[3] https://www.legislation.gov.uk/ukpga/1981/69/contents

[4] https://www.legislation.gov.uk/ukpga/2006/16/contents

Under Section 41 of the NERC Act, there is a requirement that adverse effects of development on a SPI should be avoided through planning conditions or obligations, and that planning permission should be refused where harm to these species, or their habitats occur, unless the benefits of the development clearly outweigh the harm to the SPI.

2.0 Methodology

2.1 Desk Study

A desk study was undertaken in July 2024. The methodology is provided within the Ecological Baseline Report[5]. A summary of the bat records returned within 2 km of the Survey Area central OSGR is provided within this report.

2.2 Daytime Bat Walkover (DBW)

A DBW was undertaken as part of an extended UKHab habitat survey undertaken 24 – 26 July 2024, included as part of the Ecological Baseline Report[5]. The DBW involved noting suitable habitats for foraging, commuting and roosting bats on site and in the surrounding area. Consideration was given to the connectivity of the Site and contained habitats to the wider landscape. Features such as species-rich grasslands, woodlands, waterbodies, watercourses and linear features such as hedgerows and tree-lines are all known to be important for foraging and commuting purposes. The habitats within the Survey Area were then graded as to their suitability based on the criteria in Table 2-1. However, the area is not considered of exceptional value for the region, and other suitable habitat is available within the wider landscape.

Table 2-1: Guidelines for assessing habitats on Site for suitability for bats based on habitat features within the landscape (Collins, 2023[6])

Potential Suitability	Potential flight paths and foraging habitat
None	No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitats that provide continuous lines of shade / protection for flight-lines or generate / shelter insect populations available to foraging bats).
Negligible	No obvious habitat features on site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. 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.

[5] SLR (2025). Woolley Colliery, Darton: Ecological Baseline Report. SLR Project No.: 424.065302.00001.

[6] Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust, London.

Potential Suitability	Potential flight paths and foraging habitat
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for flight-paths such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths such as river valleys, streams, hedgerows, lines of trees and woodland edge. 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. Site is close to and connected to known roosts.

2.3 Ground Level Tree Assessment (GLTA)

Trees within the Survey Area were subject to a Ground Level Tree Assessment (GLTA) survey on 30th July 2024, in line with the Bat Conservation Trust (BCT) Bat Survey Guidelines 2023[6] (hereafter referred to as 'BCT Guidelines'). This was to assess their suitability for roosting bats by looking for potential roosting features (PRFs) (such as hollows, cracks, woodpecker holes, and partially detached bark) and evidence of bats such as bat droppings, staining, sounds etc. A systematic inspection was conducted from all angles around the trees. The surveyor was equipped with binoculars and a high-powered torch.

The assessed trees were then given a grading which is based on criteria set within the BCT Guidelines (Table 2-2).

Table 2-2: Guidelines for assessing the bat roosting suitability of trees

Suitability	Description
None	Either no PRFs in the tree or highly unlikely to be any.
FAR	Further assessment required to establish if PRFs are present in the tree.
PRF-I	A tree with at least one PRF present. Only suitable for individual bats of very small numbers of bats, either due to size or lack of suitable surrounding habitats.
PRF-M	A tree with at least one PRF present. Suitable for multiple bats and may therefore be used by a maternity colony.

The survey results, and locations of trees assessed as having potential bat roosting suitability, are illustrated in Figure 1.

2.4 Bat Activity Surveys

2.4.1 Night-time Bat Walkover (NBW) Surveys

The Survey Area was assessed as having moderate suitability for foraging and commuting bats. In line with BCT Guidelines[6] one NBW was required per season (Spring, Summer and Autumn). However, due to the timing of commission it was only possible to capture Summer and August dates in 2024 (see section 2.8). The dates these surveys were undertaken are:

- Summer – July 29th; and
- Autumn – September 11th.

The survey results, route, and stationary start points are illustrated in Figure 2.

Following the DBW to scope the Survey Area and adjacent areas for habitats and specific landscape features which could be of importance to bats, NBW routes were devised, passing through the full range of broad habitats present within the Survey Area.

Surveys commenced at sunset and lasted for approximately two hours. At the start of the survey, each surveyor stood for 30 minutes at a single position within the Survey Area. The starting points were chosen based on likely bat commuting routes across the Survey Area. The starting point was altered so that each survey commenced at a different location; to remove or reduce temporal bias as much as possible. For the remaining time, surveyors walked along the defined NBW route but paused and deviated where observed bat activity warranted this.

Temperature, wind speed, wind direction, and cloud cover were recorded at the beginning and end of each survey, along with any significant weather changes during the survey (e.g. heavy showers) if experienced. The surveyors were equipped with a Batlogger M (Elekon), or an Anabat Scout (Titley Scientific), full spectrum and GPS enabled bat detector and recording device. The surveyors recorded all observed bat passes on a detailed plan of the Survey Area; noting the time, location and, where possible, the direction of flight, bat species and behaviour (i.e., commuting, foraging, or social calling, where this was evident).

A summary of the survey times, weather conditions and the start and end points, are provided in Table 2-3 below.

Table 2-3: Summary of timings and weather conditions during NBW surveys[7]

Date	Start location	Surveyor initials*	Sunset time	Time start - end	Temp (°C) Start, end	Cloud cover Start, end	Rainfall	Average wind speed and direction
July 29/07/2024	A	AB, EA	21:10	21:10 - 23:10	22, 16	2, 2	None	2, WNW
September 11/09/2024	B	AB, HM	19:30	19:30 - 21:10	10, 8	4, 1	None	3 - 4, W

*Surveyors: AB = Aaron Bailey, HM = Hannah Mercer, EA = Ed Austin.

2.4.2 Static Bat Detector Surveys

The NBW surveys were supplemented by static bat detector surveys. Song Meter SM4 (Wildlife Acoustics) full spectrum bat detectors were deployed at five locations, over the course of five consecutive nights per month of the bat active season where possible. As was the case for the NBW surveys, due to the timing of commission it was only possible to capture Summer and August dates in 2024 (see Section 2.7). Data was collected during the following periods:

- 24th – 29th July;
- 13th – 18th August;
- 11th – 16th September; and
- 11th – 16th October.

[7] *Wind speed* presented as Beaufort Scale; *wind (from) direction* presented as compass point; *rainfall* presented using qualitative precipitation intensity scale; *cloud cover* presented in oktas.

The static detector sample locations, Location A-E, were located as illustrated in Figure 3 and described in Table 2-4. A judgemental selection approach was used to determine locations of static bat detectors. This was done to ensure coverage of the different habitat types present within the Survey Area, as well as to compare predicted areas of high and low activity.

Static bat detector surveys broadly followed the methodologies contained within BCT Guidelines[6]. For each sampling period, a summary of the survey times, weather conditions, and sunset and sunrise range are provided in Table 2-5.

Table 2-4: Static bat detector locations and associated location features

Location and grid reference (OSGR)	Description
A SE 31236 10729	Within strip of scattered scrub over grassland, between open areas of hard standing. Located within the Northern Site on the east boundary of the Survey Area, adjacent to Woolley Colliery Road.
B SE 31124 10809	Woodland edge, within tall grassland with scattered scrub. Located on west side of the Northern Site.
C SE 31133 10440	Corridor between areas of dense birch (*Betula* sp.) scrub. Located within the Southern Site.
D SE 30916 10868	Open area of tall species-rich grassland with scattered scrub, with woodland edge and railway line proximate to the west. Located in the northwest of the Survey Area.
E SE 30987 10661	Within woodland. Railway line proximate to the west. Located in the west of the Survey Area.

Table 2-5: Summary of timings and weather conditions during static detector deployment[7]

Average temp. at sunset (°C)	Average min. temp (°C)	Average max. temp (°C)	Average wind speed (mph)	Average precipitation at night	Sunset time (range)	Sunrise time (range)
July 24th – 29th						
16.6	12.4	16.6	8.2	0	21:02 - 20:56	05:13 - 05:19
August 13th – 18th						
17.2	11.4	17.2	6.8	0	20:38 - 20:29	05:43 - 05:49
September 11th – 16th						
12.8	6.6	13.4	9.2	0	19:30 - 19:20	06:33 - 06:40
October 11th – 16th						
8.0	5.8	9.0	8.2	0	18:17 - 18:08	07:26 - 07:34

2.5 Bat Call Analysis

Bat recordings from NBW and static bat detector surveys were analysed using Kaleidoscope Pro software[8] (version 5.1.5) (Wildlife Acoustics) using the auto identification capability (Bats of Europe 5.1.0 filter). Sound files were then manually checked by an ecologist experienced in bat analysis to confirm identification. This involved checking all non-common pipistrelle sound files, all noise files, and a sample 10% of common pipistrelle (*Pipistrellus pipistrellus*) sound files. This was undertaken to ensure that bat calls were not missed, and to ensure a high level of accuracy with respect to species or genus identification.

During manual checking of bat calls various characteristics of the calls were used to ascertain the species, including call shape, peak frequency (i.e. frequency of maximum energy), start and end frequency, call duration and time between calls. The call parameters contained within Russ (2012)[9] were used for species identification. The following key parameters / assumptions were used to differentiate the following species:

- ***Pipistrellus* species**: quasi-constant frequency (qCF) calls with a peak frequency of more than 35 kHz but less than 40 kHz were assigned to Nathusius' pipistrelle (*Pipistrellus nathusii*); qCF calls with a peak frequency between 40 and 50 kHz were assigned to common pipistrelle; and qCF calls with a peak frequency of more than 50 kHz were assigned to soprano pipistrelle. Where it was not possible to assign to common, soprano or Nathusius' pipistrelle, the call was assigned to *Pipistrellus* species (spp.);
- ***Nyctalus* species:** calls were identified as noctule if there were two types of call of alternating frequency and the peak frequency was 21 kHz or lower; calls were identified as Leisler's bat (*Nyctalus leisleri*) if there were calls of alternating frequency, but the peak frequency was above 24 kHz and below 35 kHz. Where calls of alternating frequency had a peak frequency of between 21 and 24 kHz, the call duration and regularity of the alternating call types was used to differentiate between noctule and Leisler's, i.e. a call duration of less than 10 milliseconds with an irregular pattern of alternating call types was assigned to Leisler's, and a call duration of more than 10 milliseconds with a regular pattern of alternating call types was assigned to noctule. Where it was not possible to assign to noctule or Leisler's bat, the call was assigned as *Nyctalus* spp.;
- ***Plecotus* species**: Any calls from the *Plecotus* genus were assumed to be brown long-eared bat, as this is the only *Plecotus* species known to occur within the County[10]; and
- ***Myotis* species**: Due to the similarity in call characteristics between species within this genus, bat calls from this genus were grouped together as *Myotis* spp. Bechstein's bat (Annex II) are not present within the Site (based on geographical range) and therefore the identification to species level for this genus is not critical for the purposes of the study.

A single bat pass was defined as the presence of a bat call within a 15-second time-period, to allow for direct comparison of results. Repeat calls of the same species within this 15-second period were not counted. If two different species were present within a single 15-second time-period, this was counted as two bat passes.

[8] https://www.wildlifeacoustics.com/products/kaleidoscope-pro

[9] Russ (2012) *British Bat Calls: A Guide to Species Identification*. Pelagic Publishing, Exeter.

[10] https://www.bats.org.uk/about-bats/what-are-bats/uk-bats/grey-long-eared-bat

The number of bat passes does not relate to the number of bats present in one location but rather gives an indication of the relative level of bat activity in that location over each recording period.

The bat calls were then analysed to calculate the average number of bat passes per hour, i.e. the Bat Activity Index (BAI) value, by dividing the total number of bat passes recorded at each sample location by the number of recording nights at that location.

2.6 Ecological Impact Assessment – Valuation

Valuation as to the importance of roost sites, commuting and foraging routes and the assemblage of bats on Site was made in accordance with EcIA guidance included within the Bat Mitigation Guidelines (BMG)[11] and is outlined below.

2.6.1 Regional Species Assemblage

British bat species have been assigned into different groups based on rarity, per region within the BMG and are classified as either widespread; widespread in many geographies, but not as abundant in all; rarer or restricted distribution; and rarest Annex II species. The species found within Northern England are shown in Table 2-6 below.

Table 2-6: Categorising bats in Northern England by distribution and rarity[11]

Country & Region: England, North			
[Score 4] Rarest Annex II species and very rare	**[Score 3] Rarer or restricted distribution**	**[Score 2] widespread in many geographies, but not as abundant in all**	**[Score 1] widespread in (almost) all geographies**
N/A	Alcathoe's bat *Myotis alcathoe* Leisler's bat Nathusius' bat	Whiskered bat *Myotis mystacinus* Brandt's bat *Myotis brandtii* Daubenton's bat *Myotis daubentonii* Natterer's bat *Myotis nattereri* Noctule	Common pipistrelle Soprano pipistrelle Brown long-eared bat

2.6.2 Importance of Roosts

The EcIA guidance included within the BMG[11] includes guidance regarding the importance of bat roosts, which is based on the geographic location of species (Table 2-5) and type of roost identified.

No roosts were identified incidentally as part of the bat activity surveys undertaken within the Survey Area.

With regards to roost assessment, this was restricted to GLTA of all trees within the Survey Area, and directly adjacent. A group of trees, directly adjacent to the Northern Site, contained PRFs, however, no further roost surveys were completed in 2024 and no assessment of the importance of roosts was undertaken

[11] Reason, P.F. and Wray, S. (2023). UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.1. Chartered Institute of Ecology and Environmental Management, Ampfield.

Therefore (and under the assumption that trees with suitability for roosting bats will be retained and remain well connected to the wider landscape) no further survey or assessment of the importance of roosts was undertaken, as nugatory impacts are anticipated on potential roosting sites based on.

2.6.3 Importance of Commuting and Foraging Habitat

There is no matrix approach for assessing the importance of commuting and foraging bats due to the complexity of bat behaviour in a landscape and therefore a high degree of professional judgement must be applied. Broadly, the following factors should be considered:

- Relative level of bat activity indicating reliance on specific habitats on site and identification of IEFs;
- Landscape context: i.e. distribution of suitable foraging, commuting habitat and connectivity to wider landscape;
- Species assemblage and conservation status using a feature on site;
- Presence of species on the edge of their range;
- Proximity / connectivity to roost sites;
- Species habitat preferences and landscape context.
- Application of a precautionary approach where data is inadequate or where invasive methods have been avoided or not justified based on scale of development (e.g. identification of *Myotis* bats to species level).

As per the BMG[11], the scale of changes will determine the likely significance on commuting and foraging bat populations, however this cannot be greater than the original value assigned. For example, if a habitat is of 'district value' then the impact of significance would be of maximum 'district value' if the habitat no longer supports foraging and commuting bats post-development (i.e. functionally lost). Conversely, minimal predicted impact on functionality of this habitat may result in a lesser impact (e.g. negligible or limited to site).

The original value assigned to this site, for foraging and commuting features for bats, was moderate suitability as defined by BCT Guidelines[8].

2.6.4 Importance of Bat Assemblage

The importance of a bat assemblage provides contextual information for the site overall and is assessed when considering the three factors below:

- Species present on site (project data);
- Local species distributions;
- Regional species distributions.

To determine the maximum possible score a site can achieve a score is assigned to each species could be present and totalled (see Table 2-5), where:

- Widespread in (almost) all geographies [score 1];
- Widespread in many geographies, but not as abundant in all [score 2];
- Rarer or restricted distribution [score 3]; and
- Rarest Annex II species and very rare [score 4].

Once the maximum score is calculated, analysis of the data highlighted above will allow identification of the 'actual' bat species present and allow calculation of the site score for the

bat species present. This is then considered as an assemblage percentage score relative to the maximum score available:

- Assemblage score is less than 45% of the maximum score: Not reaching County importance (Site / Local level only);
- Assemblage score meets or exceeds 45% of the maximum score: County importance;
- Assemblage score meets or exceeds 55% of the maximum score: Regional importance; and
- Assemblage score meets or exceeds 70% of the maximum score: National importance.

For Northern England scoring thresholds are detailed in Table 2-7 below.

Table 2-7: Scoring thresholds, for importance of bat assemblages in Northern England.

Importance Level	Percentage of maximal Score	Score
County Importance	≥45%	≥10
Regional Importance	≥55%	≥12
National Importance	≥70%	≥15
Maximum Score	**100%**	**22**

2.7 Evidence of Technical Competence and Experience

All surveyors have experience in bat survey and follow the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct when undertaking ecological work. All fieldwork was carried out in accordance with best practice guidelines present at the time of survey, under the supervision of senior staff and a licensed bat ecologist where needed.

Field Surveys and Bioacoustics Analysis

The DBW was undertaken by Aaron Bailey BSc (Hons) MSc. Aaron is a Project Ecologist with SLR and a qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM). He has over three years of experience in ecological consultancy, as well as bat surveys and assessments. He is also experienced in the preparation of technical reports and ecological assessments, and a variety of other protected species surveys.

The GLTA was undertaken by Aaron Bailey, as detailed above. Aaron conducted these surveys as an accredited agent, under the licence of Gary Oliver; who is an experienced bat surveyor and holds a Class 2 Natural England survey licence for bats (2015-16056-CLS-CLS) and was formerly a Natural England trainer for the Yorkshire region.

Night-time Bat Walkover (NBW) surveys were conducted by a team of SLR ecologists, led by Aaron Bailey who was assisted by Hannah Mercer and Ed Austin.

Bioacoustics data analysis was conducted by Hannah Mercer BSc (Hons). Hannah is a Project Ecologist with SLR and a qualifying member of CIEEM. She has five years of experience carrying out bat surveys, including emergence / re-entry, night-time bat walkovers, building inspections (internal and external), endoscope inspections, hibernation surveys, bat box checks, and trapping; and is also experienced in bat call analysis.

Report and Review

This Technical Appendix was prepared by Aaron Bailey, as detailed above.

All work is subject to internal review as part of SLR's Quality Assurance procedure. This report was reviewed and approved by Associate Ecologist Mr Tom Redman. Tom has over seven years' experience in ecological consultancy and is a full member of CIEEM (MCIEEM). He holds a Class 4 Natural England bat survey licence (licence number: 2022-10876-CL20-BAT) and is a Bat Earned Recognition (BER) Consultant.

2.8 Limitations

Overall, no significant survey limitations apply, however considerations are given below.

Due to the timing of commission, a spring NBW and associated static monitoring period was not possible. It is acknowledged that earlier portions of the season are therefore not accounted for (e.g. start of active season and formation of maternity colonies etc.). However, the effects of missing data have been minimised, firstly by reporting on the average bat passes per hour (the BAI) over the two seasons and associated recording period rather than comparing absolute numbers of records. In addition, the key period of the active season (i.e. maternity season) has been recorded, with anecdotal evidence of pups being born from mid–late June 2024. Overall, the recording effort is likely to have recorded the majority of bat species likely to utilise the site and allows for identification of IEFs on site. Therefore, the conclusions of this report are unlikely to be materially different than if spring data was collected.

For the NBW surveys, the Survey Area was fully accessible, and the surveys were undertaken at the appropriate times and in broadly suitable weather conditions. The NBW surveys were undertaken by qualified surveyors'; however, the visibility of individual bats inherently decreases as light levels decrease.

Temperatures in September (Autumn) were generally low, and the NBW survey had sub-optimal ambient temperatures, being 10ºC at sunset and the survey start, and dropping to 8ºC by the end. However, this was still within the range of the BCT guidelines, which notes a minimum sunset temperature of 10ºC. Overall, comparatively low numbers of bats were recorded in September compared to July; however, the September data is still relevant as a representation of that time of year. Additionally, static bat detector surveys were conducted in September and October, with temperatures generally fluctuating between suitable temperatures and dipping below at times. Again, this data is still relevant as a representation of the area at that time of year.

This report is valid for 12 months from the date of the last survey (until 24th October 2025), in line with best practice guidance[12], and should be reviewed after this date.

[12] Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust, London. ISBN-978-1-7395126-0-6

3.0 Results

3.1 Desk Study

The desk study returned 46 records of bats within 2 km of the Survey Area centroid[1]. In order of most to least abundant, these were: common pipistrelle (*Pipistrellus pipistrellus*) (29 records), unidentified bat (7), noctule (*Nyctalus noctula*) (5), soprano pipistrelle (*Pipistrellus pygmaeus*) (3), *Myotis* sp. (1), and Leisler's bat (1). The only roost records within 2 km belong to common pipistrelle, with the closest of these being 1.85 km northwest of the Survey Area, most recently in 1992, without any immediate connection to the Survey Area and with an abundance of suitable foraging habitat in the immediate surroundings of the roost.

The Barnsley Biodiversity Trust (2023)[13] listed that there are ten bat species known to be present within Barnsley, these are: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Daubenton's, brown long eared, natterer's, noctule, whiskered, Leisler's bat, and Brandt's bat.

The Multi-agency Geographic Information System for the Countryside (MAGIC) returned no records of granted European Protected Species Mitigation (EPSML) for bats within 2 km of the Survey Area.

3.2 Daytime Bat Walkover (DBW)

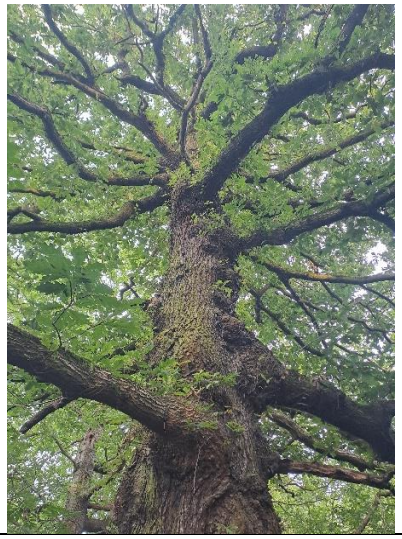
The Survey Area was assessed as having moderate suitability for foraging and commuting bats overall, due to the presence of a mosaic of suitable and well-connected habitats including areas of scrub and woodland edge, with associated woodland rides which provide sheltered foraging and commuting; tall species-rich grasslands; scattered scrub; and habitat mosaics which provide good foraging habitat through invertebrate food biomass availability. Additionally, to the west of the Survey Area is a railway line and valley bottom with a watercourse, which provide off-site connectivity and commuting corridors for bats.

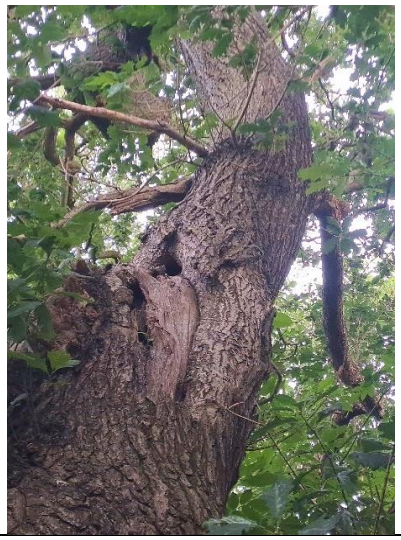
3.3 Ground Level Tree Assessment (GLTA) Survey

Trees identified as having PRFs (potential roosting features) for bats are described in Table 3-1 below and illustrated in Figure 1. These comprised three mature trees which partially overhang the northeast redline boundary of the Northern Site, located in in mature woodland. Trees have been given provisional ratings and noted as further assessment required (FAR) to further investigate and establish the presence of suitable PRFs should these trees be directly or indirectly impacted by proposals.

[13] Barnsley Biodiversity Trust (2023) *Bats.* Available at: http://barnsleybiodiversity.org.uk/bats.html

Table 3-1: Trees identified as having PRFs; table includes photographs, descriptions, and GLTA assessment results

Tree	Description and photographs
T1	 
	Mature oak (*Quercus* sp.). Several small knot holes at various heights running up the trunk on the northeast aspect; most appeared not to have a cavity from ground level using binoculars and light, but obscured cavities are possible. **Provisionally assigned roosting suitability:** PRF-I (FAR)
T2	 
	Mature oak. Several knot holes at various heights and aspects; most appeared not to have a cavity most appeared not to have a cavity from ground level using binoculars and light, but obscured cavities are possible. **Provisionally assigned roosting suitability:** PRF-I (FAR)

Tree	Description and photographs
T3	 
	Mature oak with two trunks. Small amount of butt rot within one of the trunks, large open knot hole in the other trunk; both are likely to provide access to protected cavities. Other PRFs are likely within the tree. **Provisionally assigned roosting suitability:** PRF-M (FAR)

3.4 Bat Activity Surveys

3.4.1 Night-time Bat Walkover (NBW) Surveys

The results of the NBW surveys are summarised in Table 3-2 below and illustrated in Figure 2. For each survey, the table below includes species observed, when each species was first recorded in relation to sunset time, it's general location, and associated habitat.

Table 3-2: NBW survey results, timings and dates

Date	Sunset, start and end times	Results

July
29/07/2024
	Sunset: 21:10
	Start: 21:10
	End: 23:10
		Start Location: Southern Site
		Overall, four species recorded
		
		Stationary 30-minutes section records:
		• Southern start point:
		  ○ Two records of common pipistrelle (21:37 and 21:40), coming from area of trees to the south and southwest, spending a short time looping and foraging in open area;
		• Northern start point:
		  ○ Two Leisler's bat records, both HNS, based on acoustic characteristics one was likely commuting and one was foraging;
		  ○ One common pipistrelle, likely commuting based on acoustic characteristics (HNS).

Date	Sunset, start and end times	Results

		Walked section records:
		Total of 12 records
		• Nine common pipistrelle;
		  ○ Records predominantly of foraging next to woodland edge, scrub and small areas of open ground;
		• Two Noctule;
		  ○ 22:14. HNS, likely commuting (based on acoustic characteristics) high over tall grassland area in north of Survey Area.
		  ○ 22:35, HNS, likely commuting (based on acoustic characteristics) over area comprising tall scrub edge, grassland with scattered scrub, open urban land, and nearby woodland edge.
		• One *Myotis* sp.;
		  ○ 22:08. Commuting from tall grassland area in north of Survey Area, travelling westwards between areas of tall birch scrub.

September
11/09/2024
	Sunset: 19:30
	Start: 19:30
	End: 21:10
		Start Location: Northern Site
		Overall, one species recorded
		
		Stationary 30-minutes section records:
		• Western start point:
		  ○ None
		• Eastern start point:
		  ○ 20:07 Common pipistrelle. HNS, likely commuting (based on acoustic characteristics) in area comprising a mosaic of habitats including scrub edge, grassland with scattered scrub, open land, and nearby woodland edge.
		
		Walked section records:
		Total of one record:
		• One common pipistrelle;
		  ○ 20:19. HNS, likely commuting (based on acoustic characteristics) along woodland / scrub edge within a woodland ride between mature woodland and tall birch.

In summary, the NBW surveys recorded four different bat species / species groups: common pipistrelle, Leisler's bat, Noctule, and *Myotis* spp.

Higher levels of bat activity were recorded during the July summer survey, with 17 records distributed relatively evenly across the Survey Area. The September survey only had two bat activity records. Both records were common pipistrelle, with the low levels of bat activity attributed to the sub-optimal cold temperatures (for limitations, see section 2.8).

Although there were only two bat records in the September survey, the locations of these two records matched with records from the July survey. One of the two matched locations was within the Northern Site, with a noctule record in July and a common pipistrelle record in September, located in an area comprising a mosaic of habitats including tall scrub edge, grassland with scattered scrub, open urban land, and nearby woodland edge. The other

matched location was near the centre of the Survey Area, both common pipistrelle records, within a set of woodland rides between mature woodland and tall birch scrub.

3.4.1.1 Common pipistrelle

Common pipistrelle was the most frequently recorded species during each NBW, and the only species recorded in the September survey.

Common pipistrelle records were spread across much of the Survey Area, with locations favouring the edges of woodland and scrub, combined with open spaces and rides that provide flight paths and enclosed areas that protected against the wind. There was also a correlation with the presence grasslands but to a lesser extent.

Overall, the results indicate that woodland and scrub edge habitats are of low importance for foraging / commuting for common pipistrelle bats.

3.4.1.2 Noctule

Noctule bats were only recorded in the September NBW, totalling two records in the northern half of the Survey Area, at 1 hour 4 minutes and 1 hour 25 minutes after sunset.

No foraging activity was identified although potentially suitable habitat is present (such as a mixture of broadleaved trees and woodland, open ground, and grassland).

Overall, the low number of results indicate that habitats within the Survey Area provide low importance for commuting and foraging noctule bats.

3.4.1.3 Leisler's bat

Leiser's bats were only recorded in the September NBW, totalling two records in one location in the Southern Site, during the stationary 30-minutes. Two records were heard but not seen, 24 and 29 minutes after sunset, with calls attributed to commuting behaviour. No foraging activity was identified. Records were detected from a woodland ride, bordered by broadleaved woodland and tall scrub. Woodland and woodland edge are preferred habitats for this species to commute and forage, and these habitats are common and well connected across the Survey Area, as well as the wider landscape.

Overall, these results suggest that habitats within the Survey Area provide low importance for commuting and foraging Leisler's bats.

3.4.1.4 Myotis sp.

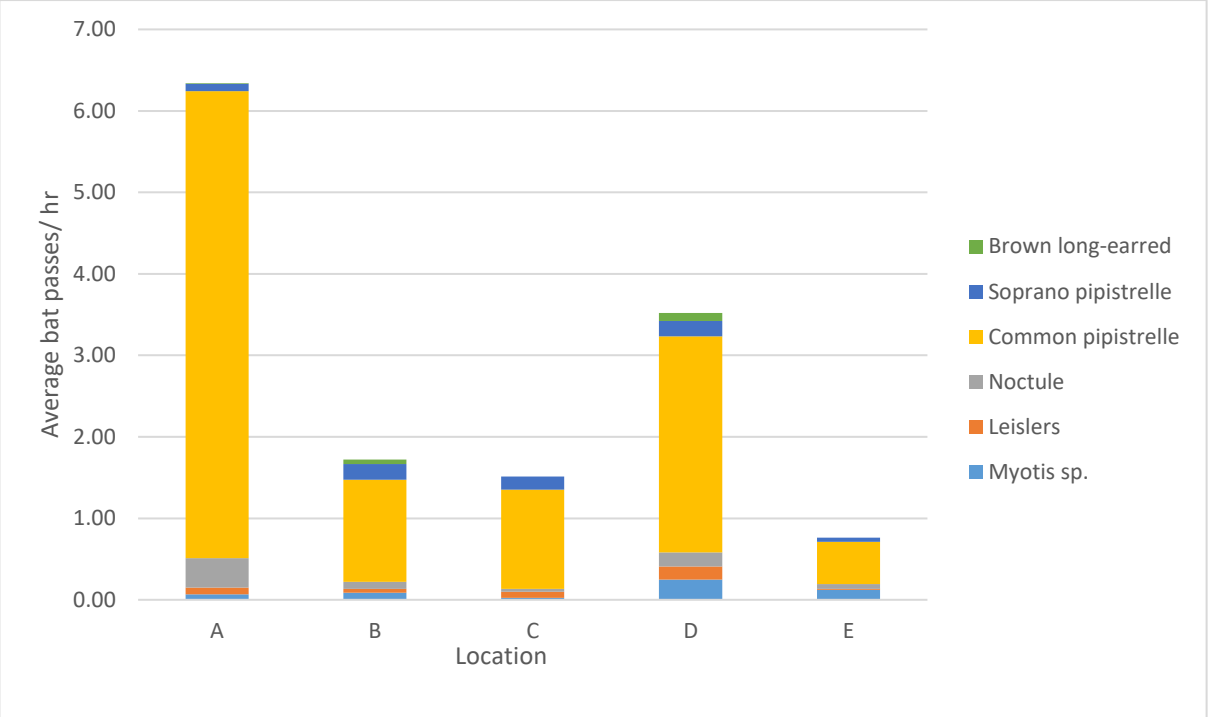
Only one *Myotis* species bat was recorded, this was during the September NBW located in the north of the Survey Area. The record was 58 minutes after sunset; seen commuting from above a tall grassland area, travelling westwards between areas of dense birch scrub.

Overall, these results suggest that habitats within the Survey Area provide low importance for commuting *Myotis* bats.

3.4.2 Static Bat Detector Surveys

The results of the static detector surveys are illustrated in Graph 3-1 below and in Figure 3. Full results are provided in Appendix A.

The associated habitats and locations of the five static bat detector locations are described in Table 2-4 (section 2.4.2 above).



Graph 3-1: Overall average bat passes per hour at each location (averaged from all surveys)

3.4.2.1 Activity averages by month

The numbers of average bat passes per hour (passes/ hr) across the four survey periods were calculated.

Bat activity levels were greatest during the survey periods of August (23.85 passes/ hr) and July (23.23 passes/ hr), with similar numbers. Activity levels were significantly lower during the survey periods of September (6.30 passes/ hr) and October (2.05 passes/ hr).

3.4.2.2 Activity averages by location

The number of average bat passes per hour (passes/ hr) across the four static locations was calculated.

Bat activity levels were greatest at Location A (6.34 passes/ hr); followed by D (3.52 passes/ hr).

Static A was positioned amongst a mosaic of habitats including scrub edge, grassland with scattered scrub, open hard standing land, and nearby woodland edge. Static D was positioned within an open area of tall species-rich grassland with scattered scrub, with nearby woodland edge and railway line.

Lower activity levels were recorded at locations: B (1.72 passes/ hr) within a reasonably dense area of woodland edge, tall grassland and with scattered scrub; C (1.51 passes/ hr) corridor between areas of dense birch scrub; and, with notably lower levels than all other locations, E (0.76 passes/ hr) located within woodland.

3.4.2.3 Species detected

The static detectors recorded six different bat species / species groups. In order of the most common to least common, across all surveys, these were: common pipistrelle (accounting for 82% of bat calls recorded); noctule (5%); soprano pipistrelle (5%); *Myotis* spp. (4%); Leisler's (3%); and brown long-eared bat (1%).

All species were detected at all static detector locations to varying amounts, with the exception of brown long-eared bat which was absent from two locations. Results for each species are summarised below.

Overall, the levels of bat activity, considered both collectively and for individual species, were identified across the Survey Area.

Common pipistrelle (82%)

Common pipistrelle was the most frequently recorded species across all locations. The highest levels of activity were recorded at Location A with an average of 5.73 bat passes per hour, followed by Location D with 2.65 bat passes per hour. Locations B and C showed lower activity levels, with 1.25 and 1.22 bat passes per hour, respectively.

Overall, common pipistrelle activity was not notably high. The results indicate that Location A and D may be of higher importance for foraging or commuting common pipistrelle bats, with both locations comprising relatively open areas with grassland and scattered scrub, and proximate to linear features such as woodland edge and linear scrub features.

Noctule (5%)

Noctule bats were recorded at low levels across all locations, with activity highest at Location A (0.36 passes per hour), which is significantly higher than the next highest levels at Location D (0.17). The lowest activity levels were recorded at Location C (0.04).

Overall, noctule activity was low. The results indicate that Location A may be of higher importance for foraging or commuting noctule bats, comprising relatively open area with grassland and scattered scrub, and proximate to linear features such as woodland edge and linear scrub features.

Soprano pipistrelle (5%)

Soprano pipistrelle bats were recorded at very low levels across all locations, with the highest activity recorded at Locations B and D (both with 0.19 passes per hour), slightly lower at Location C (0.16), and the lowest at Locations A and E (0.09 and 0.05 respectively).

Overall, soprano pipistrelle activity was low. The results indicate that Locations B and D may be of higher importance for foraging or commuting soprano pipistrelle bats, comprising grassland with scattered scrub, and proximate to linear features such as woodland edge.

***Myotis* spp. (4%)**

Myotis species were recorded at low levels across all locations. Location D had the highest activity level with 0.25 bat passes per hour, which is significantly higher than all other locations which had minimal activity (ranging from 0.12 at Location E to 0.02 at Location C).

Overall, *Myotis* spp. activity was low. The results indicate that Location D may be of higher importance for foraging or commuting *Myotis* bats, comprising grassland with scattered scrub, and proximate to linear features such as woodland edge.

Leisler's (3%)

Leisler's bats were recorded at low levels across the Site. The highest activity level was recorded at Location D (0.16 bat passes per hour), significantly higher than other locations. With lowest activity recorded at Location E (0.01) comprising dense young woodland.

Overall, Leisler's bat activity was low. The results indicate that Location D may be of higher importance for foraging or commuting Leisler's bat, comprising grassland with scattered scrub, and proximate to linear features such as woodland edge.

Brown long-eared bat (1%)

Brown long-eared bats were recorded at very low levels across the Site, with the highest activity recorded at Location A (0.09 bat passes per hour). No significant activity was observed at other locations, with Locations C and E showing no recorded activity.

Overall, brown long-eared bat activity was low. The results indicate that Location A may be of higher importance for foraging or commuting brown long-eared bat, comprising grassland with scattered scrub, and proximate to linear features such as woodland edge.

3.4.3 Importance of Bat Assemblage

A summary of the importance of the assemblage of bats present within the Survey Area is outlined in Table 3-3.

Table 3-3: Importance valuation of foraging and commuting habitat, and bat assemblage

Species in Northern England	Importance of roosts (summary justification only)	Summary of commuting and foraging habitat	Summary of importance of assemblage
Widespread in (almost) all geographies Common pipistrelle Soprano pipistrelle Brown long-eared bat	No confirmed roosts identified within the Survey Area that will be impacted directly or indirectly. However, three trees with PRFs are present. No records of roosts within 500 m of Survey Area.	The habitats in and around the Survey Area meet the definition of Moderate suitability as defined in the BCT guidelines[8]. The area is not of exceptional value for the region, and other suitable habitat is available within the wider landscape. • Common pipistrelle was the most commonly recorded species during surveys (82% of calls on static detectors) • Very low levels of activity were recorded for brown long-eared (<1.5% of calls on static bat detectors), only recorded in the north of the Survey Area, at static locations A, B and D. • Overall, greater activity levels were recorded within relatively open areas of land which comprised scattered scrub and grassland, and that were relatively close to woodland. These likely provide suitable areas for both foraging and commuting. Additionally, woodland rides had greater levels of commuting, where rides were characterised by relatively broad and open space, providing clear flight lines. • Lower activity levels were associated with dense habitat, particularly those with no clear flight path, such as the corner of scrubby woodland edge (static Location B), narrow	*1 point per species* Score = 3 for this part of the assemblage (of a maximum of 3)
Widespread, but not as abundant in all geographies Whiskered bat Brandt's bat Daubenton's bat Natterer's bat Noctule			*2 points per species* Score = at least 4 for this part of the assemblage, and up to 10 (of a maximum of 10)
Rarer or restricted distribution Alcathoe's bat Leisler's bat Nathusius' pipistrelle			*3 points per species* Score = 3 for this part of the assemblage (of a maximum of 9)
Rarest Annex 2 species and very rare N/A			*4 points per species* Score = 0 for this part of the assemblage (of a maximum of 0)

Species in Northern England	Importance of roosts (summary justification only)	Summary of commuting and foraging habitat	Summary of importance of assemblage
		woodland rides, and within woodland. • IEFs identified were the areas comprising static detector Locations A and D; with both locations comprising partially enclosed, relatively open areas, with grassland and scattered scrub, and are proximate to linear features such as woodland edge and linear scrub features.	
Based on species indicated to be present in Northern England[11], the assemblage score of the Survey Area is at least 10 (45.5%; County importance) and up to 19 (86.3%; National importance) because the *Myotis* species were not identified to species level during the survey. In relation to the *Myotis* bats, it is considered highly unlikely that Alcathoe's bat is present within the Survey Area as it is a highly geographically constrained species and is not one of the ten bat species, which are known to be present within Barnsley[13]. Therefore, a revised range of 10 (45.5%; County importance) is considered appropriate; with a theoretical maximum of up to 16 (73% - National importance). The majority of recorded activity was attributed to a single species of bat, common pipistrelle (82% of calls on static detectors). Given the low levels of *Myotis* activity (4% of calls recorded during static bat detector monitoring), and using the application of professional judgement, it is likely that the Survey Area is used by at most one or two *Myotis* species (although it is acknowledged that this genus has not been identified to species level). This therefore results in a finalised precautionary score of 10-12 (45.5-55%) meaning the assemblage falls within the threshold of County importance, in line with the BMG.			

Figure 1 Trees with Suitability for Roosting Bats

Technical Appendix 1: Results of Bat Surveys

Wooley Colliery, Darton

Gleeson Developments Limited

SLR Project No.: 424.065302.00001

10 February 2025

LEGEND

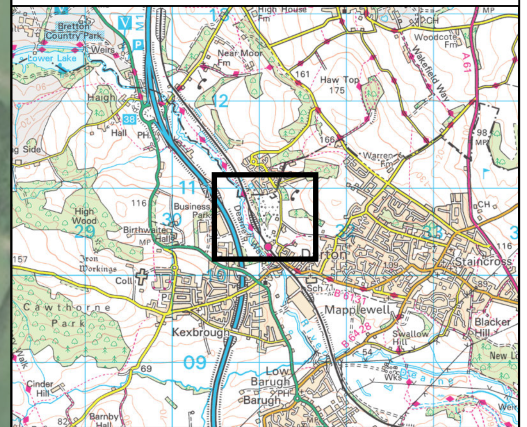
Site Boundary

Survey Boundary

Tree Suitability for Bat Roosting

PRF-I (Individual Bats) Further Assessment Required

PRF-M (Multiple Bats/Maternity) Further Assessment Required



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WOOLLEY COLLIERY, DARTON

BAT TECHNICAL APPENDIX

TREES WITH SUITABILITY FOR ROOSTING BATS

FIGURE 1

Scale	Date
1:3,500 @ A3	JANUARY 2025

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Figure 2 Night-time Bat Walkover Survey Results

Technical Appendix 1: Results of Bat Surveys

Wooley Colliery, Darton

Gleeson Developments Limited

SLR Project No.: 424.065302.00001

10 February 2025

LEGEND

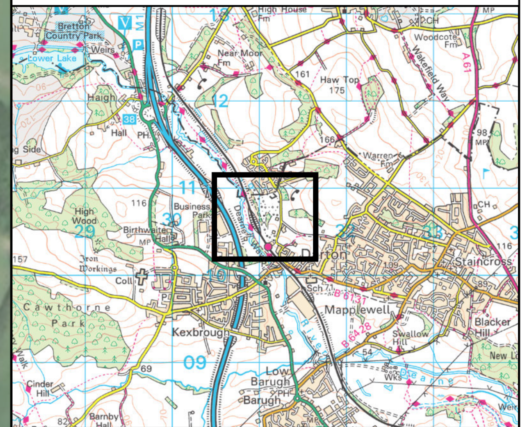
- Site Boundary
- Survey Boundary
- Survey Start Position
- Bat Activity Night Walkover Survey Route

Species Record (Labelled with Time Sighted)

- Common Pipistrelle
- Leisler's Bat
- Myotis Sp.
- Noctule Bat

Species Flight Line (Labelled with Time Sighted)

- Common Pipistrelle
- Myotis Sp.



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WOOLLEY COLLIERY, DARTON

BAT TECHNICAL APPENDIX

NIGHT-TIME BAT WALKOVER SURVEY RESULTS SUMMER 2024

FIGURE 2.1

Scale	Date
1:3,500 @ A3	JANUARY 2025

424.065302.00001.0006.0 Summer NBW Survey

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430500 430750 431000 431250 431500

411000 410750 410500

Bluebell Road

Bloomhouse Lane

M1

20:07

20:19

0 125 250

Metres

N

LEGEND

Site Boundary

Survey Boundary

Survey Start Position

Bat Activity Night Walkover Survey Route

Species Record (Labelled with Time Sighted)

Common Pipistrelle

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BAT TECHNICAL APPENDIX

NIGHT-TIME BAT WALKOVER SURVEY RESULTS AUTUMN 2024

FIGURE 2.2

Scale 1:3,500 @ A3

Date JANUARY 2025

424.065302.00001.0005.0 Autumn NBW Survey

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Figure 3 Average Activity at Bat Static Detector Locations

Technical Appendix 1: Results of Bat Surveys

Wooley Colliery, Darton

Gleeson Developments Limited

SLR Project No.: 424.065302.00001

10 February 2025

Location	Myotis Sp.	Leislers	Noctule	Common Pipistrelle	Soprano Pipistrelle	Brown Long Earred	Average Activity Total
A	0.07	0.08	0.36	5.73	0.09	0.01	6.34
B	0.09	0.05	0.09	1.25	0.19	0.05	1.72
C	0.02	0.07	0.04	1.22	0.16	0	1.51
D	0.25	0.16	0.17	2.65	0.19	0.1	3.52
E	0.12	0.01	0.06	0.52	0.05	0	0.76

LEGEND

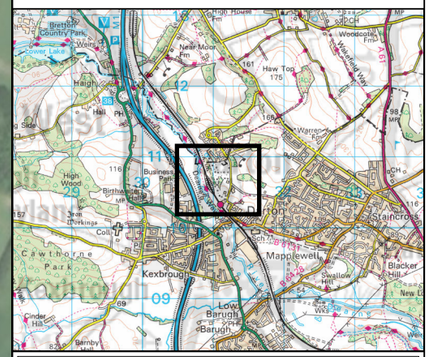
- Site Boundary
- Survey Boundary
- Bat Static Detector Location

Results of Bat Static Survey

- Brown Long Earred
- Common Pipistrelle
- Leisler's Bat
- Myotis Sp.
- Noctule Bat
- Soprano Pipistrelle

Average Activity Total

6.3
3.6
0.76



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WOOLLEY COLLIERY, DARTON

BAT TECHNICAL APPENDIX

AVERAGE ACTIVITY AT BAT STATIC DETECTOR LOCATIONS

FIGURE 3

Scale 1:3,500 @ A3

Date JANUARY 2025

424.065302.00001.0007.0 Static Detector Activity

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Appendix A Static Bat Detector Results

Technical Appendix 1: Results of Bat Surveys

Wooley Colliery, Darton

Gleeson Developments Limited

SLR Project No.: 424.065302.00001

10 February 2025

A.1 Static Bat Detector Survey Results

Data for average activity over all static bat detector surveys are presented in Table A-1. Monthly averages are presented in Tables A-2 to A-5.

Species codes used are: MYO SP. (*Myotis* spp.); NYC.LEI (Leisler's); NYC.NOC (Noctule); PIP.PIP (Common pipistrelle); PIP.PYG (Soprano pipistrelle); and PLE.AUR (Brown long-eared).

Table 4-1: Overall activity: Average bat passes per hour across all seasons

Static	MYO SP.	NYC. LEI	NYC. NOC	PIP. PIP	PIP. PYG	PLE. AUR	Total
A	0.07	0.08	0.36	5.73	0.09	0.01	**6.34**
B	0.09	0.05	0.09	1.25	0.19	0.05	**1.72**
C	0.02	0.07	0.04	1.22	0.16	0.00	**1.51**
D	0.25	0.16	0.17	2.65	0.19	0.10	**3.52**
E	0.12	0.01	0.06	0.52	0.05	0.00	**0.76**
Total	**0.55**	**0.38**	**0.72**	**11.37**	**0.68**	**0.16**	**13.86**

Table 4-2: July bat detector surveys: Average bat passes per hour

Static	MYO SP.	NYC. LEI	NYC. NOC	PIP. PIP	PIP. PYG	PLE. AUR	Total
A	0.07	0.32	0.37	6.82	0.00	0.02	**7.60**
B	0.20	0.20	0.20	2.52	0.51	0.07	**3.69**
C	0.07	0.29	0.15	3.20	0.39	0.00	**4.11**
D	0.22	0.64	0.29	4.99	0.27	0.10	**6.50**
E	0.29	0.05	0.00	0.90	0.07	0.00	**1.32**
Total	**0.86**	**1.49**	**1.00**	**18.44**	**1.25**	**0.20**	**23.23**

Table 4-3: August bat detector surveys: Average bat passes per hour

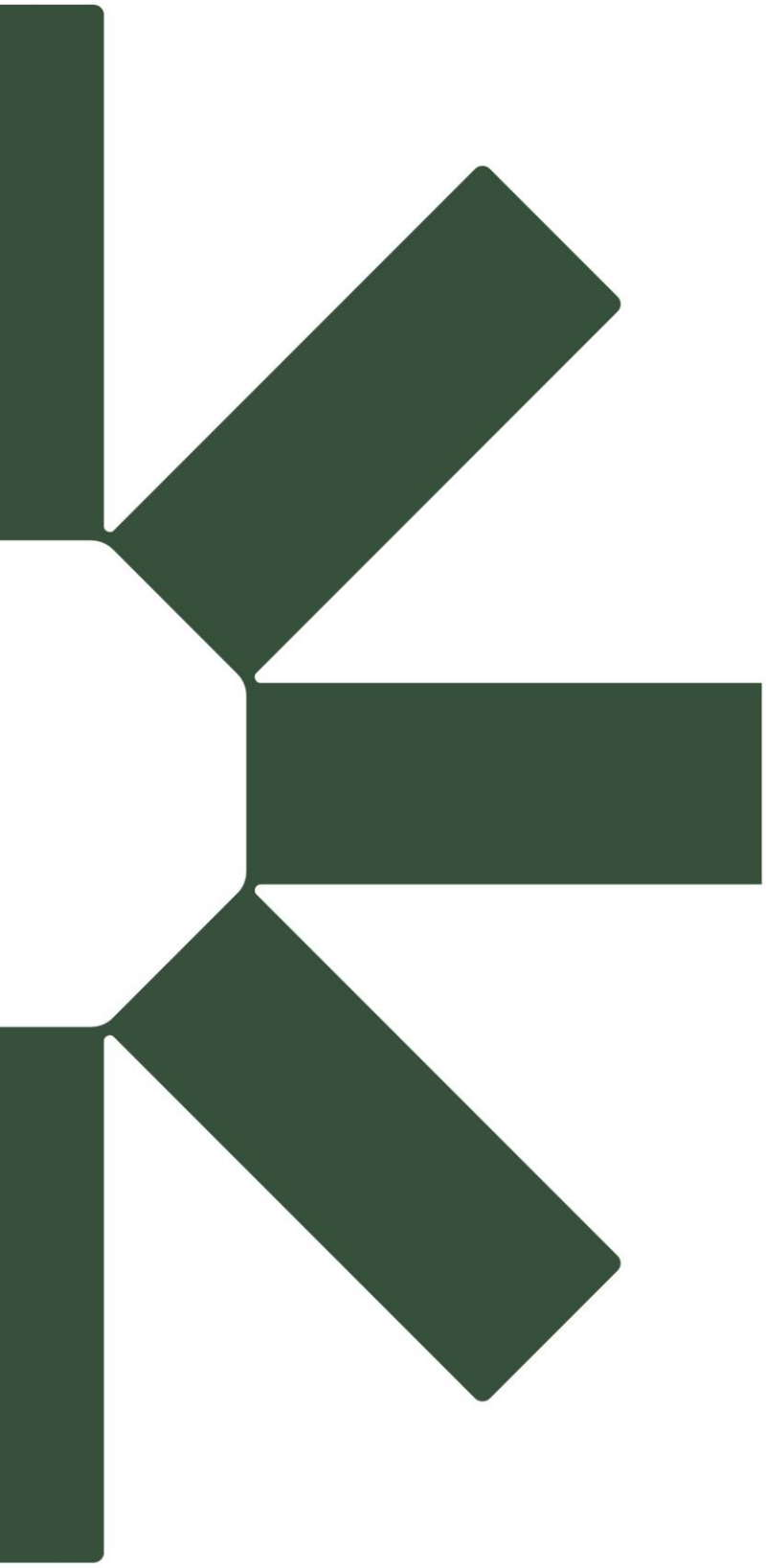
Static	MYO SP.	NYC. LEI	NYC. NOC	PIP. PIP	PIP. PYG	PLE. AUR	Total
A	0.11	0.00	0.82	13.97	0.24	0.00	**15.14**
B	0.06	0.00	0.11	1.73	0.24	0.09	**2.23**
C	0.00	0.00	0.00	0.56	0.00	0.00	**0.56**
D	0.48	0.00	0.30	3.63	0.28	0.22	**4.91**
E	0.02	0.00	0.22	0.67	0.11	0.00	**1.02**
Total	**0.67**	**0.00**	**1.45**	**20.56**	**0.86**	**0.30**	**23.85**

Table 4-4: September bat detector surveys: Average bat passes per hour

Static	MYO SP.	NYC. LEI	NYC. NOC	PIP. PIP	PIP. PYG	PLE. AUR	Total
A	0.07	0.00	0.26	1.79	0.11	0.00	**2.22**
B	0.07	0.00	0.04	0.50	0.00	0.00	**0.61**
C	0.02	0.00	0.00	0.76	0.22	0.00	**1.00**
D	0.22	0.00	0.09	1.35	0.20	0.09	**1.94**
E	0.17	0.00	0.02	0.31	0.02	0.00	**0.52**
Total	**0.54**	**0.00**	**0.41**	**4.71**	**0.54**	**0.09**	**6.30**

Table 4-5: October bat detector surveys: Average bat passes per hour

Static	MYO SP.	NYC. LEI	NYC. NOC	PIP. PIP	PIP. PYG	PLE. AUR	Total
A	0.02	0.02	0.00	0.35	0.02	0.00	**0.40**
B	0.02	0.00	0.00	0.27	0.02	0.05	**0.35**
C	0.00	0.00	0.00	0.35	0.03	0.00	**0.38**
D	0.08	0.00	0.02	0.63	0.00	0.00	**0.73**
E	0.00	0.00	0.00	0.18	0.00	0.00	**0.18**
Total	**0.12**	**0.02**	**0.02**	**1.78**	**0.07**	**0.05**	**2.05**



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