Cambois Connection – Onshore Scheme

Environmental Statement Volume 3

Technical Appendix 9.5: Bat Survey Report

sse Renewables

Cambois Connection Onshore Scheme

Technical Appendix 9.5: Bat Survey Report

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Basis of Report

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1.0 Introduction

1.1 Overview

Berwick Bank Wind Farm Limited (BBWFL) is a wholly owned subsidiary of SSE Renewables (SSER) (hereafter referred to as 'the Applicant'). The Applicant is proposing the development of Offshore Export Cables, Onshore Export Cables, an Onshore Converter Station and associated grid connection at Blyth substation in Northumberland, known as the 'Cambois Connection' ('the 'Project'). The onshore components of the Project, landward of Mean Low Water Springs (MLWS) comprise the Onshore Scheme ('the Site').

The purpose of this infrastructure is to facilitate the export of green energy from the generation assets associated with the Berwick Bank Wind Farm (BBWF), located in the outer Firth of Forth. A separate application for developing a grid connection to Branxton, East Lothian, has been included as part of the Applicant's application for consent for BBWF, currently being determined separately. The Project will enable the BBWF to reach full generating capacity (4.1 gigawatts (GW)) by the early 2030's.

The Project comprises two distinct proposals, or 'Schemes', which will require three separate consents. For the Onshore Scheme (all activities and infrastructure landward of MLWS) consent will be sought via a planning application to Northumberland County Council (NCC) as the local planning authority (LPA) under Section 57 of the Town and Country Planning Act 1990.

The offshore components of the Project seaward of Mean High Water Springs (MHWS) ('the Marine Scheme') are located within both Scottish and English waters. In Scotland, the Marine Scheme is entirely within offshore waters (i.e., between the 12 nautical miles (nm) limit and the Scottish Exclusive Economic Zone). In England, the Marine Scheme is within offshore waters and inshore waters.

A Preliminary Ecological Appraisal (PEA) for the Onshore Scheme was carried out by SLR Consulting in July and August 2022 (Technical Appendix 9.8, Volume 3). The field-based aspect of the PEA incorporated a site survey to identify broad habitat types present in accordance with UK Habitat Classification (UKHab) methodology (Butcher *et al*., 2020). The survey was also extended to include a high-level assessment of broad habitat types for their suitability to support protected and / or notable species. A further site walkover was then completed in April 2023 and recommendations of survey areas were made to the client.

SLR Consulting Ltd was commissioned by SSE Renewables ('the Client') in May 2023 to conduct detailed protected and notable species surveys within the Site. This baseline report provides the results of a suite of bat surveys carried out within the Site during the 2023 active bat season (between May and September). The information contained herein will be appended to the Environmental Statement (ES) which will contain the relevant impact assessment and mitigation proposals.

1.2 Purpose of this Report

The overarching aim of this study was to obtain baseline information relating to use of the site by bats and associated levels of activity.

Specific survey objectives were to:

- Assess the suitability of habitats within the site for supporting commuting, foraging and roosting bats;
- Identify the bat species assemblage using the site; and

- Assess the level of activity of all bat species recorded at the site, both spatially and temporally.

The assessment of ecological effects as a result of the onshore components of the Project and any recommended mitigation, compensation and enhancement measures is beyond the scope of this study. This information is instead presented separately within Chapter 9 of the Environmental Impact Assessment Report (EIAR).

1.3 Relevant Legislation

All bats in the United Kingdom are classed as European protected species and receive full protection under both national and international legislation (Appendix A). The overarching aim of this legislation is to protect, restore and maintain populations of protected bat species at favourable conservation status[1], thereby making it an offence to kill, injure or disturb any bat, or damage or destroy a bat roost. It is therefore important to understand what species of bat utilise the site, and how they use it, so that any potential impacts on populations can be adequately assessed, avoided, and/or mitigated for, and maintain compliance with relevant legislation.

1.4 Evidence of Technical Competence and Experience

Table 1-1 provides details of the SLR staff who carried out bat survey work and assessment as part of this study.

Table 1-1 SLR staff involved in bat survey and assessment

Name and Position	Professional Membership and License Details	Years of Experience	Tasks conducted
Callum Taylor	Qualifying member of CIEEM	5 years	Survey design; bat habitat suitability assessment; PRA of trees; transect survey.
Niamh Ni Nagy	Qualifying member of CIEEM	1 year	Transect survey; static detector deployment and collection.
Rachel McLeod	Qualifying member of CIEEM	3 years	Transect survey; static detector deployment and collection; sound analysis.
Hannah Rowding	Associate member of CIEEM (ACIEEM) NatureScot bat licence - 224935	7 years	Transect survey; sound analysis Quality Assurance review; Technical Reporting.
Sara Toule	ACIEEM	10 years	Quality Assurance review.

1 'Favourable conservation status' describes as situation in which a species is thriving throughout its natural range and is expected to continue to thrive in the future.

2.0 Methodology

2.1 Desk Study

A desk-based study was carried out in October 2022 to gather information relating to existing records of bat species within the site and surrounding area. This included:

- A search for statutory designated sites (for which bats are a qualifying feature) within 10 km of the site boundary, conducted through the Multi Agency Geographic Information for the Countryside (MAGIC) website[2];
- A data request for records of protected and otherwise notable species (including bat flight and roosting records) within 2 km of the site boundary, submitted to Environmental Records Information Centre (ERIC) North East;
- A review of aerial imagery (Google Earth[3]) to identify habitats within the site and surrounding area that bats may utilise for commuting, foraging or roosting purposes.

To provide further background information for the bat survey and assessment, a review of existing ecological data within the following documentation was also carried out:

- BritishVolt Project Phoenix Environmental Statement (ES) (Ridge, 2021); and
- A bat survey report produced to inform a planning application for a battery storage site at West Sleekburn, approximately 1 km north of the site (Quants Environmental, 2022).

2.2 Field Survey

The field survey methodology was designed in accordance with Bat Conservation Trust guidelines of relevance to the study period (Collins, 2016). Full details of each survey type are provided below; in instances where the methodology deviates from current guidelines, a rationale has been provided.

2.2.1 Survey Area

The bat 'survey area' incorporated all land within the boundary of the Site, as illustrated in Figure 9.5.1. As such the survey area has been referred to as 'the Site' throughout the remainder of this document.

2.2.2 Habitat Suitability Appraisal

A walkover of the Site to assess the suitability of habitats to support commuting, foraging, and roosting bats was carried out during daylight hours in April 2023During the appraisal, habitats within the Site were assessed against specific criteria detailed within Collins (2016) in order to assign a 'level' of commuting and foraging suitability (i.e., High, Moderate, or Low). Stands of trees and were also evaluated using the same criteria to ascertain high-level assessment results relating to the potential suitability of woodland for supporting roosting bats.

2 https://sitelink.nature.scot.home [Accessed October 2023].

3 https://earth.google.co.uk/ [Accessed October 2023].

2.2.3 Preliminary Roost Assessment

A ground based Preliminary Roost Assessment (PRA) was carried out in July 2023. The assessment focused on trees within the Site that were identified during the habitat suitability appraisal as having features or qualities that may be suitable for roosting bats.

During the assessment, a detailed inspection of trees to identify features that may be used as entry and exit points for roosting bats, and a search for any evidence of bats, was carried out. Where suitable roost features were identified, they were categorised as low, moderate, or high suitability, to indicate the likelihood of bats being present and to inform the requirement for further survey work.

Trees identified as having bat roost potential were not required for additional presence or likely absence surveys for this stage of application but would be considered at the detailed planning stage. Northumberland County Council (NCC) has agreed that this approach is acceptable as detailed in NCC response 9th June.

2.2.4 Bat Activity Survey

In order to obtain information relating to bat species that utilise the Site and levels of associated activity, a programme of bat activity surveys were carried out during the 2023 active bat season (of which extends from April to October 2023 inclusive). Details relating to each survey type are described below.

2.2.4.1 Walked Transect Survey

Based on the results of the habitat suitability appraisal (Section 3.2.1), a programme of walked transect surveys were developed, incorporating one survey visit per month during suitable weather conditions[4]. In addition, one dusk and pre-dawn survey was also conducted within a single 24-hour period to accord with guidance outlined in Collins (2016).

Prior to surveys commencing, two transect routes, measuring 4.5 km and 1.6 km in length, were designed to incorporate the range of habitats present within the Site, whilst also encompassing those considered suitable for commuting, foraging or roosting bats (e.g., waterbodies, woodland edge, and linear features such as hedgerows) (Figure 9.5.1). The transect routes were then walked during daylight hours to allow surveyors to familiarise themselves with the terrain prior to walking in darkness.

While two transect routes were designed at the outset, these were combined during each survey visit to form one larger survey route. This combined transect survey commenced at sunset and continued until 2-3 hours after sunset. Bat passes[5] were recorded using Batlogger M2 full spectrum bat detectors, with the time and type of activity (e.g., commuting or foraging) also recorded on transect survey forms. On each survey visit, transects were walked in different directions (either clockwise or anticlockwise) in order to capture bat activity during the night at different locations more effectively. Listening Points (LPs) were also applied to the transect route (Figure 9.5.1), with three minutes of stationary recording carried out at each LP.

[4] In accordance with Collins (2016) and NatureScot *et al* (2021), suitable weather conditions relate to sunset temperatures of 10ºC or above, no strong winds (i.e. ground level wind speed of 5 m/s or lower), and no rain/very light rainfall.

[5] The term 'bat pass' refers to individual files recorded on a bat detector that contains echolocation call sequences likely to have been made by a single bat. In cases where two or more bats are present within an individual file (characterised by differences in peak frequency, call structure, call length and inter-pulse interval), these have been recorded as two or more passes. It is important to note that number of bat passes does not necessarily relate to the number of bats present in one location, as one bat may make several passes per night; yet rather, gives an indication of the level of bat activity occuring in that location during each survey period.

Details summarising timing of each of the 2023 transect surveys are provided in Table 2-1.

Table 2-1 Transect survey timings

Month	Date	Dusk/Dawn Transect	Sunset/Sunrise	Survey Start	Survey End
May	24.05.23	Dusk	21:22	21:22	00:04
June	19.06.23	Dusk	21:49	21:47	01:05
July	19.07.23	Dusk	21:31	21:34	00:10
August	17.08.23	Dusk	20:35	20:40	23:19
	18.08.23	Dawn	05:45	03:24	05:42
September	05.09.23	Dusk	19.49	19.50	22.34

2.2.4.2 Static Detector Survey

A programme of bat activity surveys using four full spectrum static bat detector units (Wildlife Acoustics SM4BATFS) was carried out at four locations during the 2023 active bat season. The positioning of the static detectors was designed to correspond with the bat activity transect route. Details relating to the location and positioning of each static detector are displayed in Appendix B and illustrated in Figure 9.5.1.

Where possible, deployment of detectors was targeted for periods where the weather forecast indicated the best possible chance for suitable weather conditions (i.e. dusk temperature of 10ºC or above, ground level wind speed of 5 m/s or lower, and no rain/very light rainfall). To accommodate for variable weather conditions, static detectors were deployed for a period of 10 nights during each month to maximise the chances of obtaining a minimum of five nights of data during optimal weather conditions.

Each static detector unit was set to record bat activity for a minimum period 10 days and a period of five consecutive nights has been selected for analysis per month, with each night of monitoring commencing approximately 30 minutes before sunset and ending 30 minutes after sunrise. The dates and timings of each static detector survey period are provided in Table 2-2.

Table 2-2 Summary of static detector survey dates

Month	Survey Dates	Number of Survey Nights Per Static Detector
May*	26.05.23 – 31.05.23	5
June	21.06.23 – 25.06.23	5
July	24.07.23 – 29.07.23	5
August**	19.08.23 – 23.08.23	5
September**	31.08.23 – 05.09.23	5

* Due to a technical malfunction, one static detector did not return any data during the month of May.

**Due to a technical malfunction, one static detector recorded data on only three of the five survey nights in August. The same detector also returned no data for the month of September. Further details are provided in Section 2.2.4.5 Limitations.

2.2.4.3 Weather Data

Weather information corresponding to static bat detector deployment dates was obtained primarily through the Met Office Weather Observation Website (WOW) using the ‘Woddys

Home' weather station[6] in Blyth, located approximately 3 km south-east of the Site (Ordnance Survey [OS] grid reference NZ 30845 80859). Due to a lack of available data, the 'World Weather Online' website[7] was used to obtain indicative temperature, windspeed and rainfall information for the month of August.

2.2.4.4 Bat Sonogram Analysis

Bat echolocation calls recorded during activity surveys were analysed in full spectrum format using Kaleidoscope Pro software, in accordance with guidance outlined in Russ (2021). An automatic identification filter within Kaleidoscope Pro was initially applied to assign calls to likely species, using a 'Bats of Europe' filter. This software is designed to automatically assign recorded echolocation calls with bat species that produce the same echolocation call structure. While the software is efficient, it is not totally infallible. Manual classification of echolocation files was therefore carried out by an experienced member of staff for the following:

- Files classified through the automatic identification filter as locally rare bat species, or species considered to be outside of their current range (Mathews *et al*., 2018);
- A minimum of 10% of all common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* echolocation files assigned through the auto identification filter;
- Due to close similarities in the echolocation call structure of certain species, some echolocation files were identified to genus level only. This is of relevance to species of the following genera:
    - *Myotis* species – Daubentons *Myotis daubentonii*, Natterers *Myotis nattereri*, or whiskered bat *Myotis mystacinus*;
    - *Nyctalus* species – Noctule *Nyctalus noctula* or Leislers bat *Nyctalus leisleri*; and
    - *Pipistrellus* species – common, soprano, or Nathusius' pipistrelle *Pipistrellus nathusii*.

2.2.4.5 Limitations

Preliminary Roost Assessment

It is understood that the current design avoids impacts to existing buildings within the Site. Should further project design iterations mean that buildings within the Site may be affected, additional detailed surveys of such buildings would be required.

The 2023 PRA therefore focussed attention on trees and woodland within the Site that may be suitable for use by roosting bats.

Activity Survey

Transect Survey

Two transect survey routes were initially designed to incorporate the range of habitat types present within the Site. By combining both transect routes into one survey visit, the total length of survey became slightly greater than the recommended distance detailed within Collins (2016) (total length of transect routes combined was 6 km, while the recommended distance is 3-5 km). In turn, the potential for missing periods of peak bat activity at certain

[6] https://wow.metoffice.gov.uk/observations/details/20230531yye9xmeybre67rj4rymrfqirmr [Accessed October 2023].

[7] https://www.worldweatheronline.com/blyth-weather-history/northumberland/gb.aspx [Accessed October 2023].

locations within the Site increased. This issue was however rectified as far as possible by ensuring the transect was walked in different directions, and starting locations varied, during each survey visit. Therefore, this limitation is not considered to have caused a significant impact to survey findings.

Static Detector Survey

Each static detector was deployed for a period of five nights per month between May and September 2023 (totalling 20 nights of deployment per survey period). The total number of nights for which static detectors were deployed over the entire survey period was therefore 100. However, due to a technical malfunction with Static Detector C, no data was returned for the following nights:

- 26th - 31st May 2023 (five nights);
- 21st - 23rd August 2023 (three nights); and
- 31st August - 5th September 2023 (five nights).

Due to this limitation, the total number of survey nights with data returned was 87, as shown in Table 2-3. Despite this issue, data collected from surrounding monitoring locations is considered adequate in demonstrating bat species assemblage and associated levels of activity across the Site.

Table 2-3 Total number of static detector survey nights versus total number of survey nights with data returned

Month	Survey Dates	Total Number of Survey Nights (all Static Detectors)	Total Number of Survey Nights with Data Returned
May	26.05.23 – 31.05.23	20	15
June	21.06.23 – 25.06.23	20	20
July	24.07.23 – 29.07.23	20	20
August	19.08.23 – 23.08.23	20	17
September	31.08.23 – 05.09.23	20	15
Total		**100**	**87**

Weather Data

Weather data was collected from a Met Office accredited weather station in Blyth. However, no data was available for the month of August at this location. In addition, no data relating to windspeed was available for the September survey period at this location.

In order to provide indicative information relating to temperature, windspeed and rainfall during the August survey period, and windspeed for September survey period, data was instead obtained through the 'World Weather Online' website[7].

2.2.4.6 Chance

This study provides a 'snapshot' of the conditions prevailing at the time of the activity survey. Lack of evidence of any one protected bat species does not necessarily preclude them from being present on site at a later date. Whilst it is considered unlikely that evidence of additional bat species has been overlooked, due to the nature of the survey, it is feasible that some species may not have been recorded by virtue of habit or random chance.

2.2.4.7 Assessment of relative bat activity levels

Following analysis of echolocation recordings, data can be processed using the Ecobat online tool[8]. This tool compares activity data recorded on site with bat data collected within a defined search area at the same time of year and, where possible, in comparable weather conditions (Linnott *et al*., 2018). From data added, the tool generates a percentile rank for each night of activity, which are then categorised into activity 'levels' ranging from low to high. However, as the Ecobat online tool has been shut down for essential maintenance for a number of months, it was not possible to generate results for bat activity levels within the site relative to those in the surrounding area. Instead, the data gathered has been analysed and processed to show overall bat activity levels across the Site, as well as spatial and temporal variations recorded within the Site during the 2023 survey period. This data is considered to provide an accurate representation of bat activity within the Site at the time of the surveys and will serve to effectively to inform the EIAR for the Project.

[8] Details relating to the Ecobat online tool are available at https://www.mammal.org.uk/science-research/ecostat/ecobat/ [Accessed October 2023].

3.0 Results

3.1 Desk Study

3.1.1 Statutory Designated Sites

The online data search returned no records of statutory sites designated for the purpose of bat conservation within 10 km of the site.

3.1.2 Data Search

Please note the Onshore scoping boundary was much larger than the current Site boundary therefore some records reported may be found in excess of 2 km.

The data search carried out by ERIC North East returned records of the following bat species within 2 km of the site:

- Common pipistrelle;
- Soprano pipistrelle;
- Nathusius pipistrelle;
- *Pipistrellus* species;
- Daubentons bat;
- Natterer's bat;
- Whiskered bat;
- Whiskered/Brants bat;
- Noctule; and
- *Nyctalus* species.

In addition, a review of information on the MAGIC website identified six European protected species licences (EPSL) for common pipistrelle within 2 km of the site, all of which were located outside the site itself.

3.1.3 Existing Ecological Records

Bat activity surveys carried out during 2020 to inform the BritishVolt Project Pheonix ES (Ridge, 2021), relating to a proposed battery manufacturing plant located within the Site boundary recorded the presence of the following species in flight:

- Transect surveys - common pipistrelle and soprano pipistrelle; and
- Static detector surveys - common pipistrelle, soprano pipistrelle, *Pipistrellus* species and *Myotis* species.

In addition, a single dusk emergence bat survey carried out on a building at West Sleekburn, approximately 1 km north of the site, recorded common pipistrelle and noctule in flight. It was concluded that roosting bats were however likely absent from the site (Quants Environmental, 2022).

3.2 Field Surveys

3.2.1 Habitat Suitability Appraisal

During the PEA survey, the Site was found to support serval habitat types that would be suitable for use by commuting and foraging bats, including hedgerows, woodland edge, watercourses, and wetlands, of which maintain connectivity with the wider landscape. While the large fields within the west of the Site provide limited foraging potential, they may however serve as open commuting pathways between areas of more suitable bat habitat.

Stands of mature trees, hedgerows, and buildings, were also identified as areas of potential roosting resource within the Site.

Through considering the habitat features present within the Site and wider landscape, the Site was classified as having overall ‘moderate’ suitability to support bats.

3.2.2 Preliminary Roost Assessment

The ground-based PRA identified 17 trees within the Site with features that may support roosting bats. The results are summarised below, and illustrated in Figure 9.5.2, with full details provided in Appendix C.

- Three trees were classified as ‘high’ suitability for supporting roosting bats. It should be noted that one of the trees (TN 1) was classified as high suitability due to the presence of a bat box as opposed to specific features of the tree itself; and
- 14 trees classified as ‘moderate’ suitability for roosting bats;

3.2.3 Bat Activity Survey

3.2.3.1 Transect Survey

The results of the activity transect surveys carried out between May and September 2023 are displayed in Table 3-1 and Chart 3-1.

In summary, a total of 276 bat passes were recorded over six survey visits, with at least five bat species recorded in flight (including passes assigned to genus level):

- Common pipistrelle;
- Soprano pipistrelle;
- Species of the genus *Pipistrellus* (echolocation pulses with call frequency parameters that overlapped with more than one *Pipistrellus* species);
- Species of the genus *Myotis*;
- Noctule;
- Leislers; and
- Species of the genus *Nyctalus* (echolocation pulses with call frequency patterns that overlapped with both noctule and Leislers bats).

Table 3-1 Activity transect survey results

Month (Date)	Dusk/Dawn	Common pipistrelle	Soprano pipistrelle	*Pipistrellus* species	*Myotis* species	Noctule	Leislers	*Nyctalus* species	Total
May (24.05.23)	Dusk	9	4	0	0	0	0	0	13
June (19.06.23)	Dusk	11	3	2	0	106	1	48	171
July (19.07.23)	Dusk	21	11	2	11	1		0	46
August (17.08.23)	Dusk	10	4	0	0	0	0	0	14
August (18.08.23)	Dawn	6	0	0	0	0	0	0	6
September (05.09.23)	Dusk	23	2	0	0	0	0	1	26
Total		**80**	**24**	**4**	**11**	**107**	**1**	**49**	**276**

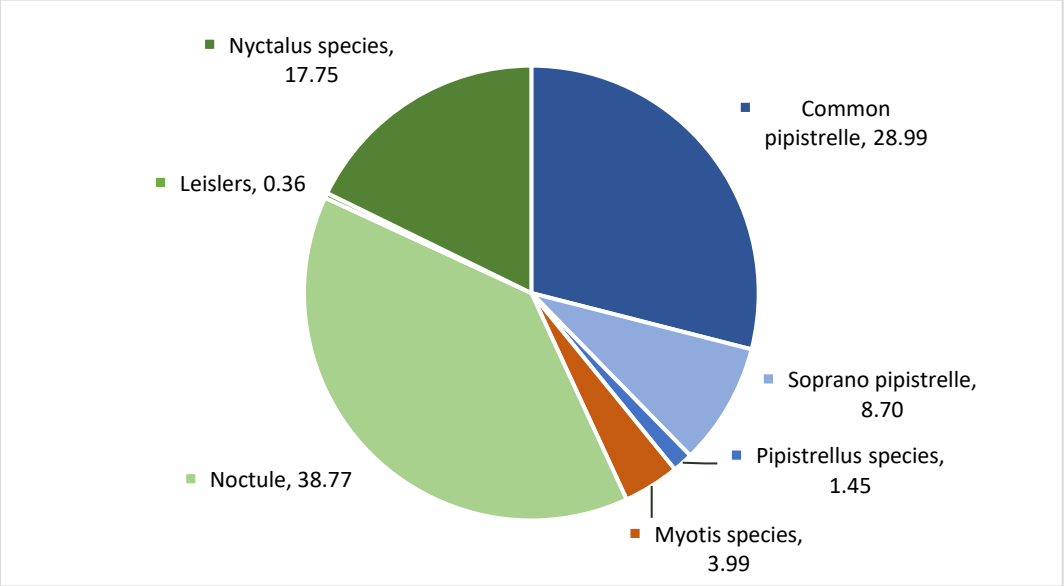
The data presented in Table 3-1 indicates that the species with the greatest overall number of passes recorded was noctule, with a total of 107 passes. This equates to 38.77% of total passes recorded from all survey nights combined, as illustrated in Chart 3-1. However, almost all noctule passes registered were recorded on the night of 19th June 2023, indicating a distinct peak in species activity during the month of June.

Bat passes attributed to the genus Nyctalus (either noctule or Leislers bat) followed on this, with a total of 49 passes (equating to 17.75% of total passes recorded). Once again, almost all passes were recorded on 19th June 2023.

Activity associated with common and soprano pipistrelle totalled 80 and 24 passes respectively (equating to 28.99% and of 8.70% of total bat passes recorded). The temporal distribution of activity across each month also appears to be more consistent in comparison to noctule and Nyctalus species, with no distinct peaks in activity noted in Table 3-1.

The remaining passes recorded during the transect surveys relate to species of the genus *Myotis* (11 passes – 3.99% of total), *Pipistrellus* species (4 passes – 1.45% of total) and Leislers bat (1 pass – 0.36% of total).

Chart 3-1 Proportion (%) of total species passes recorded within the site during activity transect surveys



3.2.3.2 Static Detector Monitoring

Bat Activity – Whole Site Overview

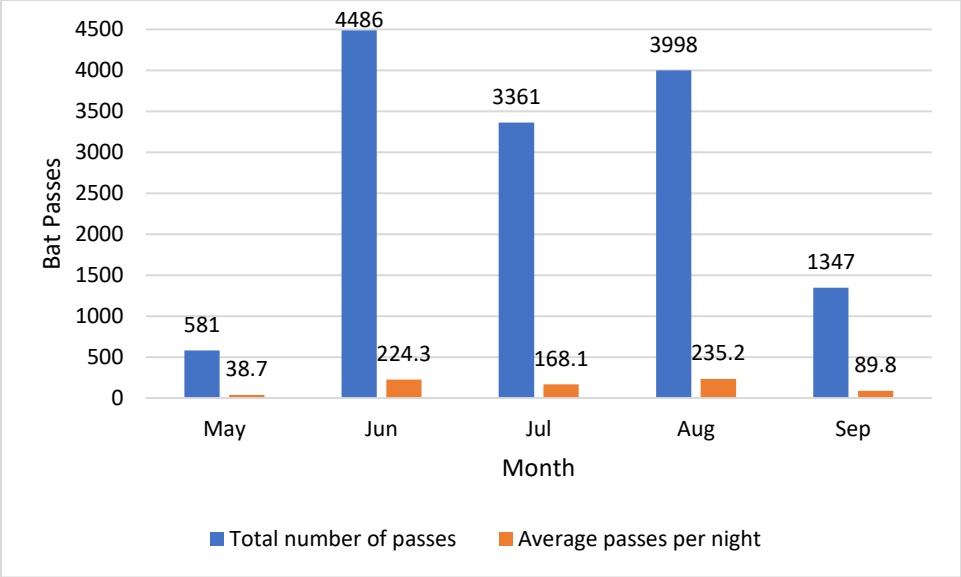
Four static detectors were deployed within the Site for a total of 87 nights during the 2023 active bat season. During this time, a total of 13,773 bat passes were recorded (see Appendix D for full details). A summary relating to spatial and temporal patterns of bat activity for the Site as a whole, and general activity levels demonstrated by each species, is described below.

Temporal and Spatial Activity

The total number of bat passes recorded across the site during each month of survey is shown in Chart 3-2, with full results presented in Table D-3 of Appendix D. The information presented indicates that:

- The greatest number of bat passes overall was recorded during the month of June, with a total of 4486 passes (averaging 244 passes per night). The number of bat passes recorded during the July and August survey period was also relatively high in comparison to other months, with a total of 3361 and 3998 passes respectively (averaging 168 and 235 passes per night for each respective survey period).
- Lowest overall bat activity was recorded during the month of May, with a total of 581 passes (averaging 38.7 passes per night over a total of 15 nights). It should however be noted that true overall levels of bat activity in May and September are likely to be higher than reported due to the lack of data returned from Static Detector C as a result of a technical malfunction during these time periods.

Chart 3-2 Total and average bat passes per night, per month, for the whole Site

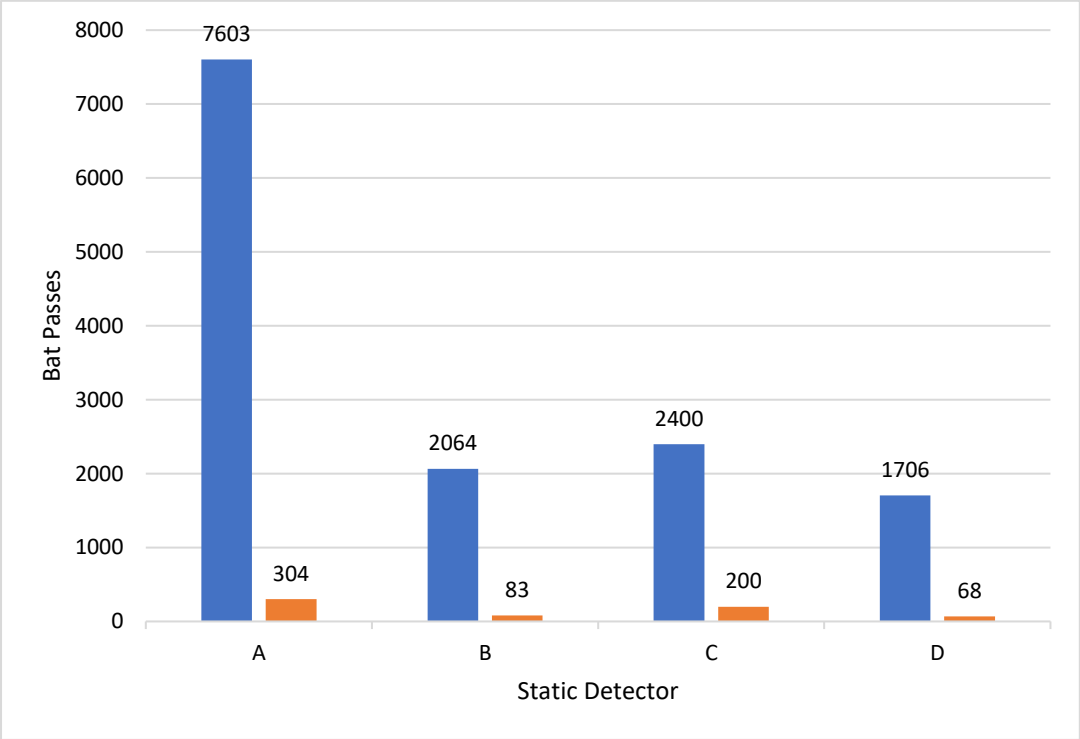


Spatial overview

The total number of bat passes recorded at each static detector location is shown in Chart 3-3, with full results presented in Table D-1 of Appendix D. The information presented indicates that:

- The highest overall level of bat activity was recorded at Static Detector A, with a total of 7603 passes (averaging 304 passes per night).
- Overall levels of bat activity at Static Detectors B and C were relatively similar, with a total of 2064 and 2400 passes respectively. Average passes per night show a greater difference however, measuring 83 passes per night at Detector B and 200 passes per night at Detector C. This relates to the total number of nights surveyed, whereby data for the full 25 night survey period was returned for Static Detector B, while data for only 17 nights was returned for Static Detector C due to a technical malfunction. Therefore, despite the fewer nights of data obtained, activity levels at Static Detector C remain high.
- The lowest overall level of bat activity was recorded at Static Detector D, with a total of 1706 passes recorded (averaging 68 passes per night).

Chart 3-3 Total and average bat passes, per detector, recorded over the entire survey period



Activity by Species – Whole Site Overview

Data analysis identified at least six bat species utilising the Site during the survey period:

- Common pipistrelle;
- Soprano pipistrelle;
- Nathusius pipistrelle;
- *Pipistrellus* species;
- Noctule;
- Leislers;
- *Nyctalus* species; and
- *Myotis* species.

Chart 3-4 summarises the total number of passes per species recorded at each static detector within the Site between May and September 2023. The proportion of total passes per species relative to the total number of passes recorded overall is illustrated in Chart 3-5. Average and median passes per night per species are displayed in Chart 3-6. For a full breakdown of results, please refer to Appendix D.

Chart 3-4 Total number of species passes recorded across the whole site during the 2023 activity survey period

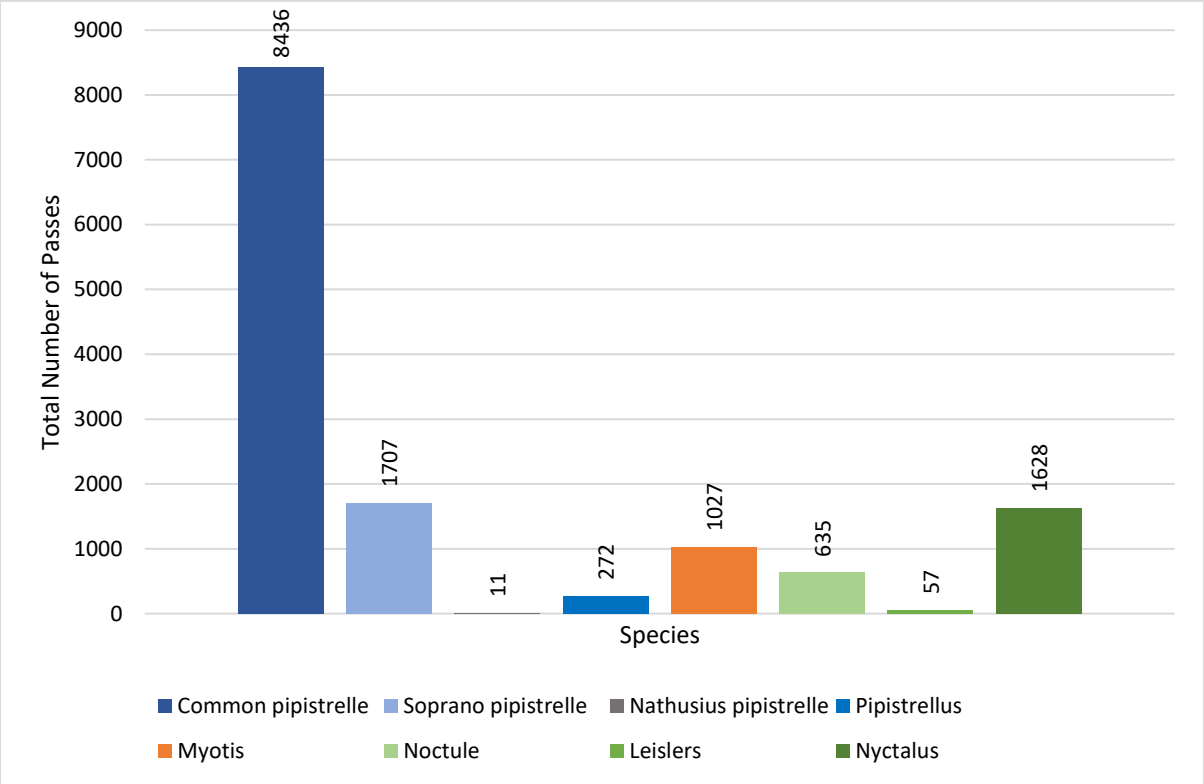


Chart 3-4 indicates that the most frequently recorded species within the Site was common pipistrelle, with a total of 8436 passes recorded. This equates to 61.25% of total bat passes recorded within the Site during the survey period (see Chart 3-5 below). From this total, average passes per night were 389, while median passes per night were 245 (Chart 3-6), indicating a variation in activity levels between survey nights/months. The greatest level of common pipistrelle activity was recorded at Static Detector A, which was positioned in line with woodland edge habitat within the south-east of the Site (Appendix B and Figure 9.5.1).

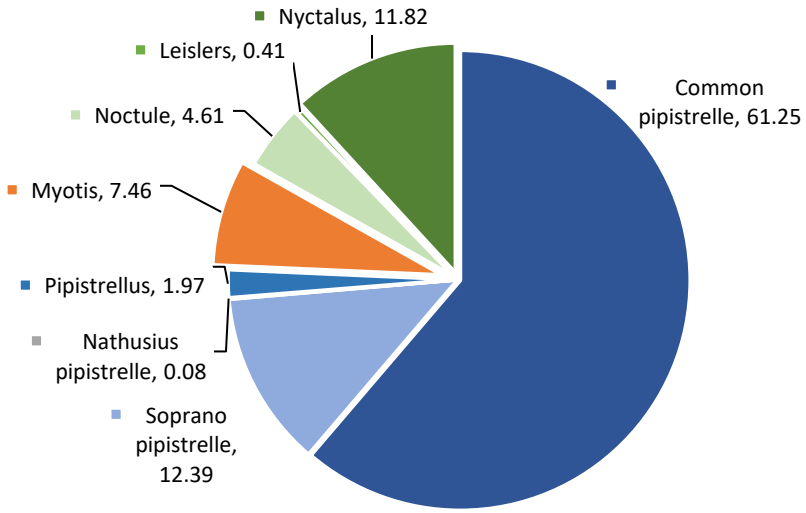
Soprano pipistrelle was the second most encountered species within the Site, with a total of 1707 passes recorded during the survey period (equating to 12.29% of total bat passes recorded). Average passes per night measured 76, with a median value of 41. The greatest level of Soprano pipistrelle activity was recorded at Static Detector A.

Bat passes attributed to species of the genus *Nyctalus* were the third most frequently encountered registrations, with a total of 1628 passes recorded within the Site during the survey period (averaging 99 passes per night and equating to 11.82% of total bat passes recorded). Numerous files were also attributed to individual species, for which there were 635 noctule passes (accounting for an additional 4.61% of total passes) and 57 Leislers passes (0.41% of total passes). The greatest level of *Nyctalus* activity was recorded at Static Detector C, which was located adjacent to woodland edge habitat within the north of the Site (Figure 9.5.1). For passes attributed to individual *Nyctalus* species (i.e., noctule or Leislers), the greatest level of activity was recorded at Static Detector A.

For species of the genus *Myotis*, a total of 1027 passes were recorded during the survey period. This averages 47 passes per night (with a median value of 32) and accounts for 7.26% of total passes recorded within the site. The greatest level of Myotis activity was recorded within the vicinity of Static Detector D, which was located within woodland edge habitat near the centre of the site.

The remaining echolocation files were attributed to *Pipistrellus* species (totalling of 252 passes which equates to 1.97% of total passes recorded) and Nathusius' pipistrelle, (totalling 11 passes, which averaged 0.6 passes per night and equates to 0.08% of total passes recorded during the survey period).

Chart 3-5 Proportion (%) of total species passes recorded within the site as a whole during static activity surveys



A chart displaying average and median bat passes per night recorded across the site during the 2023 survey period is shown below (Chart 3-6). The differences between average and median displayed relate to variations in levels of bat activity during each night of survey (i.e. the greater the difference between average and median values shown for each species, the greater the difference in activity levels between survey nights).

Chart 3-6 Average and median bat passes per night for the site as a whole

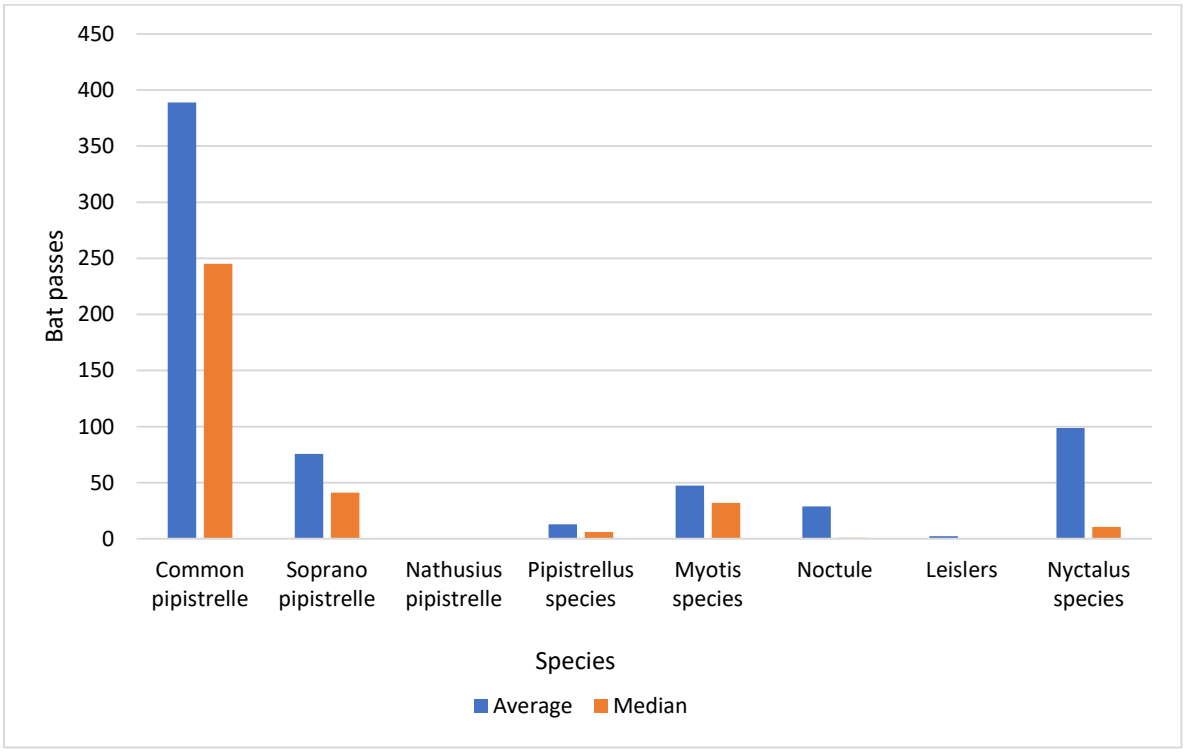
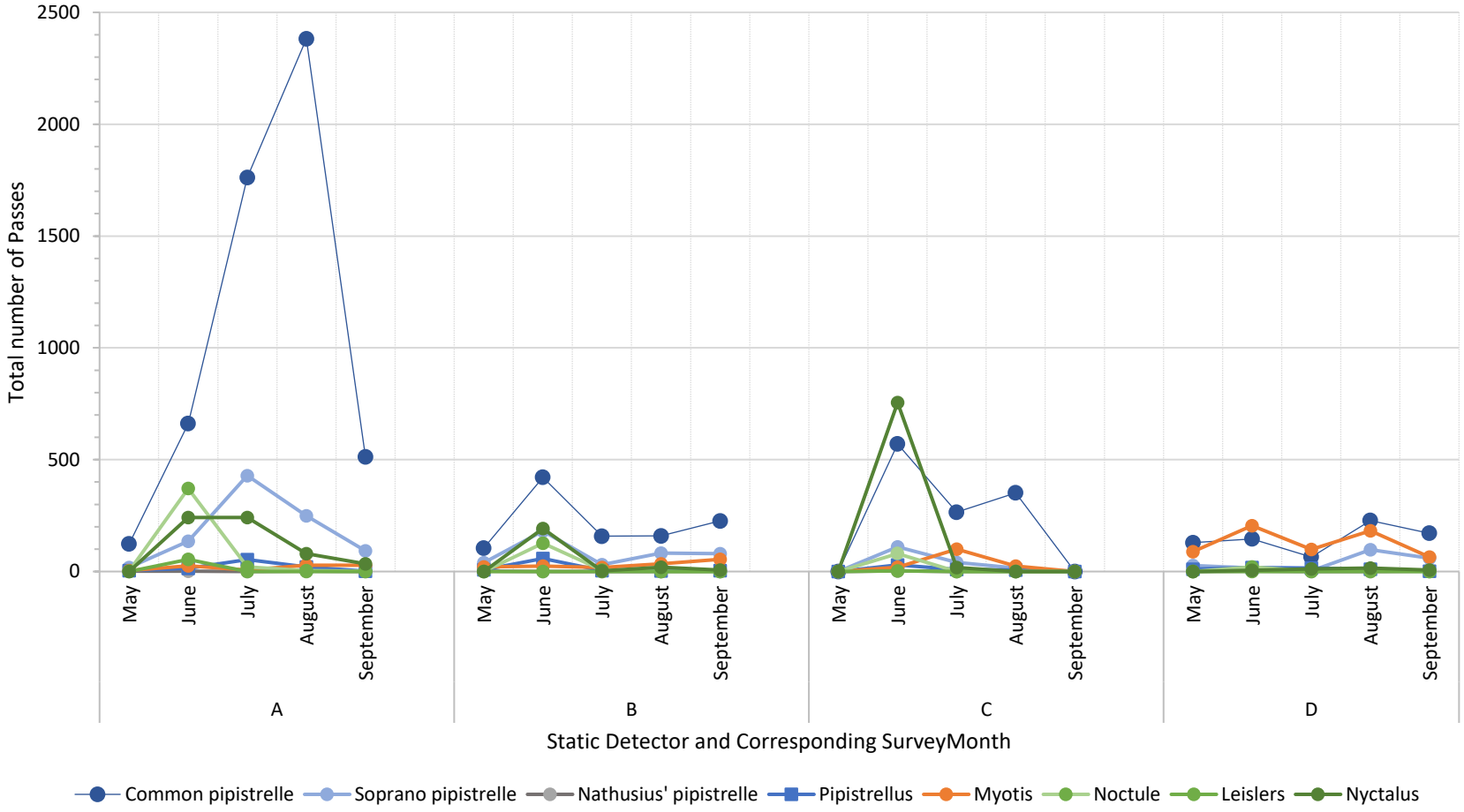


Chart 3-7 Total number of passes per detector, per month



Species-specific Results

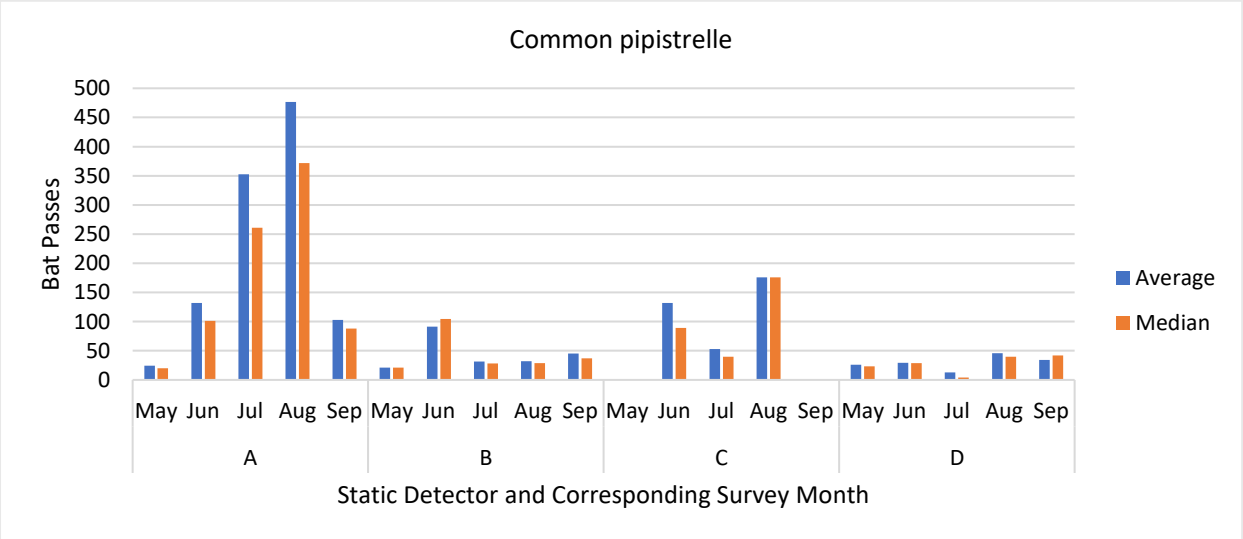
The total number of bat passes recorded at each static detector, per survey month, is illustrated in Chart 3-7. Species-specific average and median bat passes per night, recorded at each static detector, per survey month, are provided in Chart 3-8 to Chart 3-13. A summary account of the spatial and temporal occurrence of each species is described below.

Common Pipistrelle

The total number of common pipistrelle passes recorded at each static detector, per survey month, is illustrated in Chart 3-7. A summary of average and median passes per night, recorded at each static detector, per survey month, is provided in Chart 3-8. The data presented illustrates that:

- Common pipistrelle was recorded at all static detector locations during each month of survey.
- The greatest levels of common pipistrelle activity were recorded in July and August at Static Detector A, with a total of 1762 and 2382 passes recorded respectively (averaging 352.4 and 476.4 passes per night).
- The lowest levels of common pipistrelle activity were recorded in May across almost all static detector locations, averaging between 21 and 25.8 passes per night. Note that this excludes zero values obtained for Static Detector C, for which no data was obtained for the month of May or September.
- The greatest variation in common pipistrelle activity, as shown through differences in average and median passes per night, was recorded during the months of July and August at Static Detector A.

Chart 3-8 Average and median common pipistrelle passes per night, per detector, during each survey month



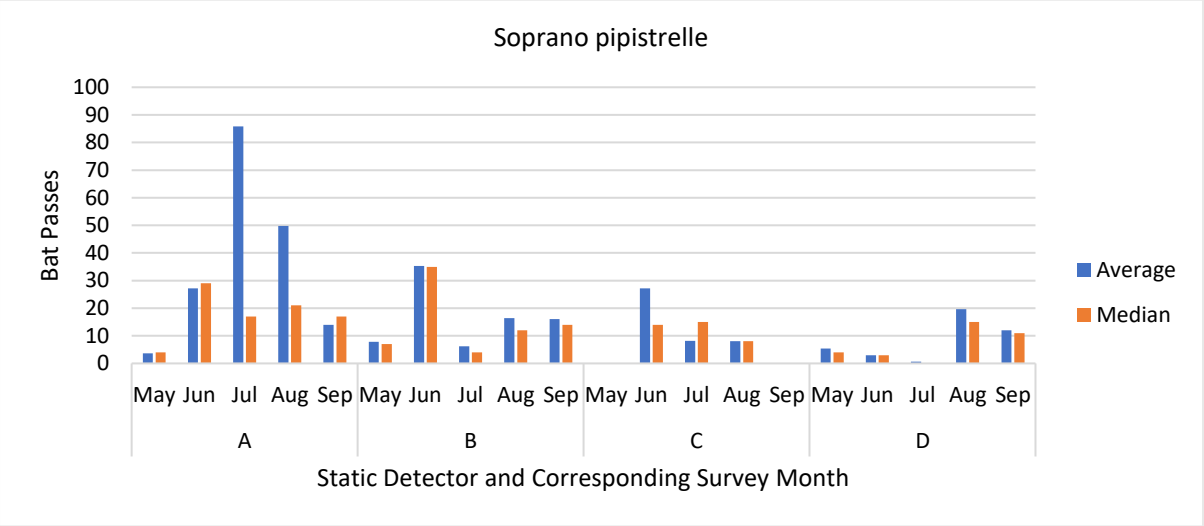
Soprano Pipistrelle

In terms of soprano pipistrelle activity, the data presented in Chart 3-7 and Chart 3-9 illustrates that:

- Soprano pipistrelle was recorded at all static detector locations during each month of survey.

- The greatest levels of soprano pipistrelle activity were recorded in July and August at Static Detector A, with a total of 429 and 249 passes recorded respectively (averaging 85.8 and 49.8 passes per night).
- The lowest levels of soprano pipistrelle activity were recorded in July at Static Detector D (with a total of 3 passes, averaging 0.6 passes per night) and in May at Static Detector location A (with a total of 18 passes, equating to an average of 3.6 passes per night). Note that this excludes zero values obtained for Static Detector C, for which no data was obtained for the month of May and September.
- The greatest variation in soprano pipistrelle activity was recorded in July and August at Static Detector A, as shown through the large difference in median and average passes per night.

Chart 3-9 Average and median soprano pipistrelle passes per night, per detector, during each survey month

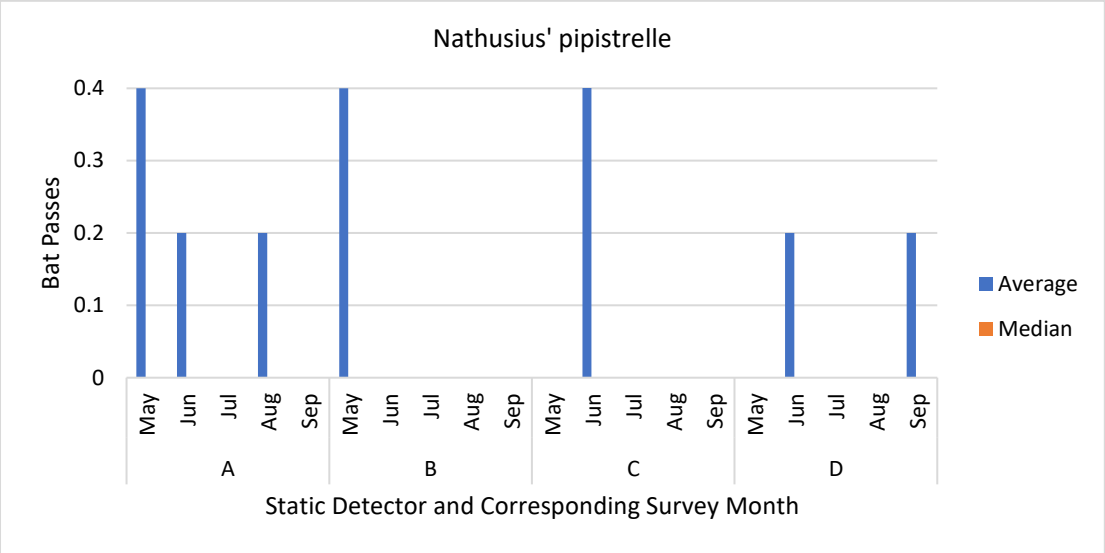


Nathusius' pipistrelle

The data presented in Chart 3-7 and Chart 3-9 illustrates that:

- Bat activity attributed to Nathusius' pipistrelle was identified at all static detector locations, however passes were not recorded during all survey months.
- Levels of Nathusius' pipistrelle activity were generally low, with a maximum of four and five passes recorded during the month of May and June (averaging less than one pass per night).
- Median passes per night, for all nights of survey, were zero. This demonstrates the low level of confirmed Nathusius' pipistrelle passes recorded during the survey season.

Chart 3-10 Average and median Nathusius' pipistrelle passes per night, per detector, during each survey month

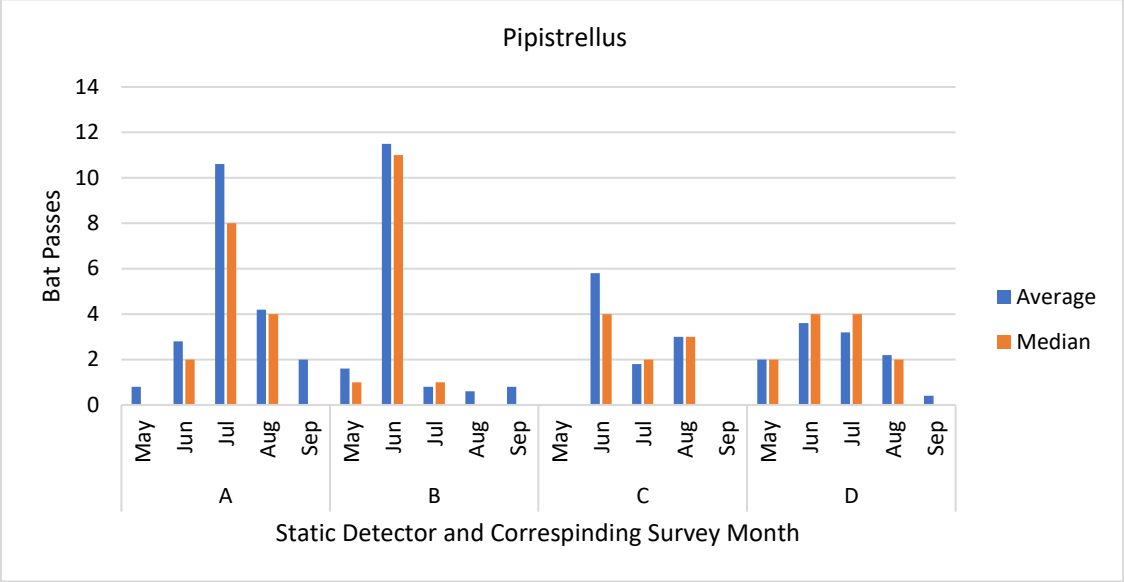


Pipistrellus species

Echolocation files containing bat passes that were not easily identifiable as either common, soprano, or Nathusius' pipistrelle species, due to overlapping echolocation call parameters, have been classified to genus level only. This data is presented in Chart 3-7 and Chart 3-11 and indicates:

- Bat activity attributed to species of the genus *Pipistrellus* was identified at all static detector locations, during each survey month (with the exception of the month of May and September at Static Detector C, for which no data was obtained).
- The greatest levels of *Pipistrellus* activity were recorded in Static Detector A in July (totalling 53 passes with an average of 10.6 passes per night) and Static Detector B in June (totalling 58 passes with an average of 11.5 passes per night).
- The lowest levels of Pipistrellus activity were recorded at Static Detector A in May, Static Detector B in August and September, and Static Detector D in September. At these locations and survey periods, total passes recorded ranged between two and four and average passes per night was less than one.
- The level of *Pipistrellus* activity during each night of survey was relatively consistent throughout the survey period, as indicated in the limited difference between values for average and median passes per night.

Chart 3-11 Average and median *Pipistrellus* passes per night, per detector, during each survey month

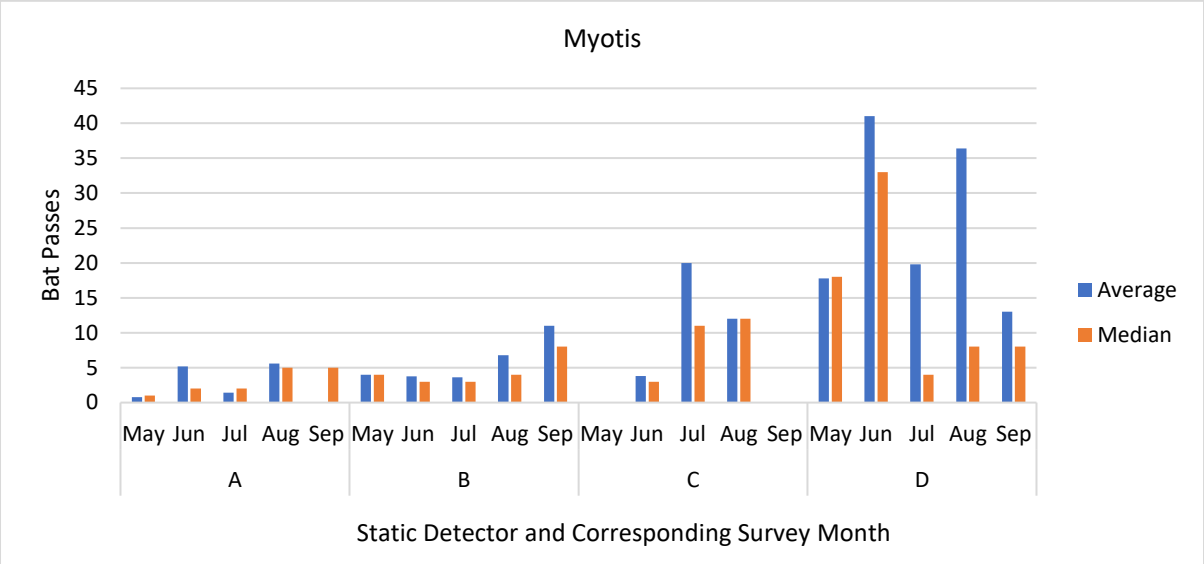


Myotis species

The data presented in Chart 3-7 and Chart 3-12 illustrates that:

- *Myotis* species were recorded at all static detector locations during each month of survey.
- The greatest level of *Myotis* activity overall was recorded at Static Detector D during the months of June and August, with a total of 205 and 182 passes respectively (averaging 41 and 36.4 passes per night).
- The lowest levels of Myotis activity were recorded during the month of May (with a total of 113 passes, averaging 7.5 passes per night), with Static Detector A having recorded the least number of passes during this survey period.
- By far the greatest variation in *Myotis* species activity was recorded in July and August at Static Detector D, as shown through the large difference in median and average passes per night.

Chart 3-12 Average and median *Myotis* passes per night, per detector, during each survey month



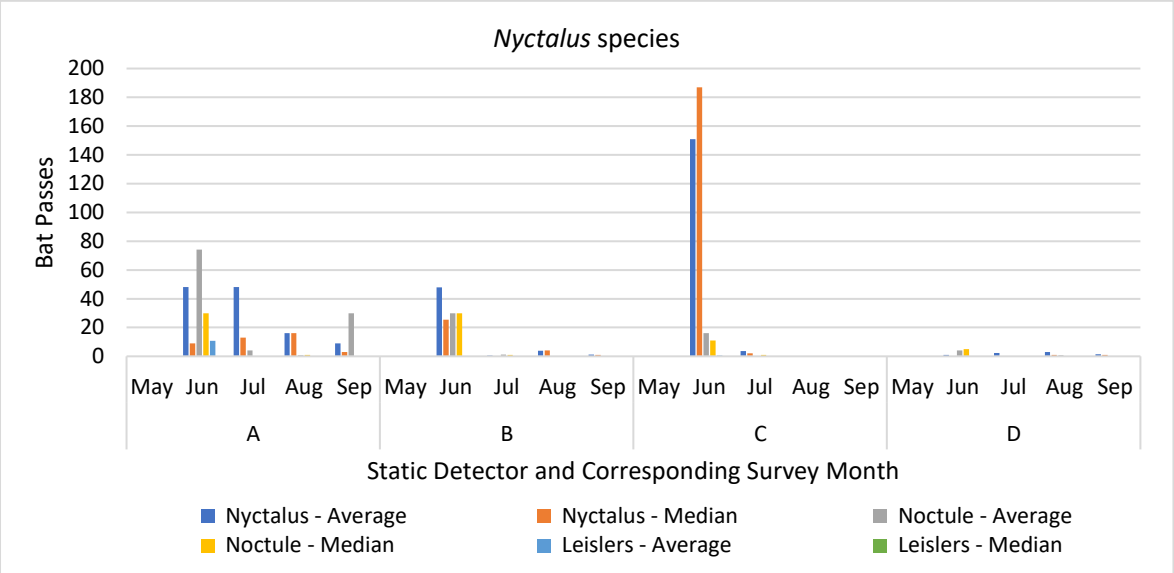
Nyctalus species

For the purposes of presenting and evaluating results of data obtained, echolocation calls attributed to individual bat species of the genus *Nyctalus* (i.e., noctule of Leislers bat), have been grouped with calls attributed to genus level only.

The data presented in Chart 3-7 and Chart 3-13 illustrates that:

- Species of the genus *Nyctalus* were recorded at all static detector locations during almost all survey months (with the exception of Static Detectors B and D in May, and Static Detector C during the month of August).
- The greatest level of *Nyctalus* activity was recorded in June across all Static Detector locations. The individual monitoring location with by far the highest level of activity in June was Static Detector C, with a total of 755 passes recorded (averaging 151 passes per night). In this instance, the median number of passes per night (187) is higher than the average (151) due to much higher numbers of *Nyctalus* species recorded on the first three survey nights (21st to 23rd June) compared to the last two survey nights (24th and 25th June).
- Bat activity attributed to species of the genus *Nyctalus* was lowest during the month of May, with only one pass (relating to a noctule bat) recorded at Static Detector A (averaging less than one pass per night).

Chart 3-13 Average and median *Nyctalus* passes per night, per detector, during each survey month



3.2.3.3 Weather Data

Data relating to climatic conditions recorded during the bat activity surveys is presented in Appendix E. Survey dates selected for analysis indicate optimal weather conditions (sunset temperature at least 10°C, with no/very little rain or strong wind) during all survey nights.

4.0 Summary and Conclusion

4.1 Bat Habitat Suitability

Commuting and foraging

Habitats within the Site are formed of a mixture of open grassland, mixed woodland, hedgerows, open mosaic habitats, and wetlands, for which connectivity is maintained with the wider landscape. Bat activity was recorded within a range of habitat types during transect surveys and at all four static detector locations during each month, thereby indicating that habitats within the Site (particularly hedgerows and woodland edge) serve as an important commuting and foraging resource for a range of bat species.

Roosting

During the PEA, stands of mature woodland, hedgerows, and buildings, were identified as areas of potential roosting resource within the Site.

The follow up ground-based PRA identified several individual trees (situated within stands of mature woodland that were highlighted during the PEA) with features of moderate and high suitability to support roosting bats. A bat box was also identified on a tree within the south of the Site, and as such, has been classified as a confirmed roost until further detailed inspection of the feature is conducted. Further detailed surveys of all suitable roost features is likely required at detailed planning stage in order to determine the roosting status of bats that have been recorded to utilise the site, see section 2.2.3.

The potential roost suitability of buildings were not assessed during the follow up ground-based PRA due to a lack of available access and that no buildings will be lost as a result of the project.

4.2 Bat Activity Summary

Data recorded during bat activity surveys has confirmed that at least six bat species utilise the Site for commuting, foraging, and potentially roosting purposes. A summary relating to each bat species recorded during the 2023 survey period is provided below.

Common pipistrelle

The desk study data search returned historic records of common pipistrelle (both in flight and roosting) within 2 km of the Site. Common pipistrelle was present during activity transect surveys and was the most frequently encountered species during the static activity survey, accounting for 61.25% of total bat passes within the Site. Activity levels were highest during June, July and August, with the greatest overall level of activity recorded during these months at Static Detector A (located adjacent to woodland edge habitat within the south of the Site).

Soprano pipistrelle

The desk study returned historic records of soprano pipistrelle within 2 km of the Site. Soprano pipistrelle was present during activity transect surveys and was the second most frequently encountered species during static activity surveys, accounting for 12.39% of total passes. The greatest levels of activity were recorded during the months of July and August at Static Detector A.

Nathusius' pipistrelle

The desk study returned historic records of Nathusius' within 2 km of the Site. While this species was not recorded during activity transect surveys, it was recorded during the 2023

static activity surveys, accounting for 0.08% of total bat passes. Based on information provided in Mathews *et al*., (2018), in north-east England the range of Nathusius' pipistrelle extends only to small pockets land near the coast, for which the Site is positioned relatively nearby. The occurrence of such species within the Site is therefore plausible. While overall number of confirmed species passes was low (total of 11), several bat passes relating to either common or Nathuisus' pipistrelle were also attributed to the genus *Pipistrellus* (as opposed to assigning an individual due to overlapping call frequency parameters).

Pipistrellus species

Data relating to species of the genus *Pipistrellu*s were returned through both the desk study and field-based survey. *Pipistrellus* species were recorded during activity transect surveys and were also recorded at all static detector monitoring locations during each survey month (accounting for 1.75% of total bat passes). The greatest levels of *Pipistrellus* activity were recorded at Static Detector B in June and Static Detector A in July.

Myotis species

The desk study returned historic records of *Myotis* species (Daubentons, Natterers and whiskered/ Brandt's bat) within 2 km of the Site. *Myotis* species were also recorded during activity transect surveys and at all static detector monitoring locations during each survey month, with data accounting for 7.26% of total bat passes. The highest levels of *Myotis* activity were recorded within the vicinity of Static Detector D, of which was located within woodland edge habitat near the centre of the Site.

Nyctalus species

The desk study returned records of both noctule and *Nyctalus* species within 2 km of the Site. Results from the activity survey indicate that noctule and *Nyctalus* demonstrated the greatest proportion of bat passes, however these were almost all recorded on the night of 19th June 2023.

Passes attributed to species of the genus *Nyctalus* were also recorded at all static detector locations, during almost all survey months, accounting for 16.84% of total bat passes within the Site (the sum of *Nyctalus*, noctule and Leislers proportions combined). As per results of the activity transect surveys, the greatest level of *Nyctalus* activity was recorded in June across all static detector locations. The individual monitoring location with the highest level of activity was Static Detector C, of which was located adjacent to woodland edge habitat within the north of the Site.

References

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Mathews, F., Kubasiewicz, L.M., Gurnell, J, Harrower, C.A, McDonald, R.A, Shore, R.F. (2018) *A Review of the Population and Conservation Status of British Mammals.* A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough. ISBN 978-1-78354-494-3. Avlaible online at https://www.mammal.org.uk/wp-content/uploads/2021/06/MAMMALS-Technical-Summary-FINALNE-Verision-FM3290621.pdf

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Russ, J. (ed) (2021) *Bat Calls of Britian and Europe. A Guide to Species Identification*. Pelagic Publishing, Exeter.

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Ridge (2021) BritishVolt Project Pheonix Environmental Statement. Volume 3: Appendices, Technical Appendix 7.1. Ecological Appraisal.

Appendix A Relevant Legislation

Legislation

All bat species found in England and Wales are classed as European protected species. They receive full protection under the Conservation of Habitats and Species Regulations 2017 (as amended)[9] and the Wildlife and Countryside Act 1981 (as amended)[10]. Under this legislation, it is an offence to deliberately:

- Capture, injure or kill a wild bat;
- Damage or destroy a breeding or resting place;
- Intentionally or recklessly disturb a bat while it's in a structure or place of shelter or protection;
- Intentionally or recklessly obstruct access to their resting or sheltering places; and
- Possess, sell, control or transport live or dead bats, or parts of them.

Planning Policy

Planning policy of relevance to this study includes:

- National Planning Policy Framework (NPPF)[11] – Chapter 15 Conserving and enhancing the natural environment;
- Circular 06/05 Biodiversity and Geological Conservation – Statutory Obligations and Their Impact Within the Planning System[12];

National Planning Practice Guidance Natural Environment – paragraphs 10 – 35[13]

9 The Conservation of Habitats and Species Regulations 2017 (legislation.gov.uk)

10 https://www.legislation.gov.uk/ukpga/1981/69 [Accessed October 2023].

11 GOV.UK Department for Levelling Up, Housing and Communities (2021a). Available online at https://www.gov.uk/guidance/national-planning-policy-framework [Accessed October 2023].

12 GOV.UK Ministry of Housing, Communities and Local Government (2005) Government Circular: Biodiversity and geological conservation – Statutory obligations and their impact within the planning system. GOV.UK, London. Available from https://www.gov.uk/government/publications/biodiversity-and-geological-conservation-circular-06-2005 [Accessed October 2023].

13 GOV.UK Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government (2019) National Planning Practice Guidance Natural Environment. GOV.UK, London. Available from https://www.gov.uk/guidance/natural environment [Accessed October 2023].

Appendix B Static Detector Locations

TableB-1: Static Detector Locations

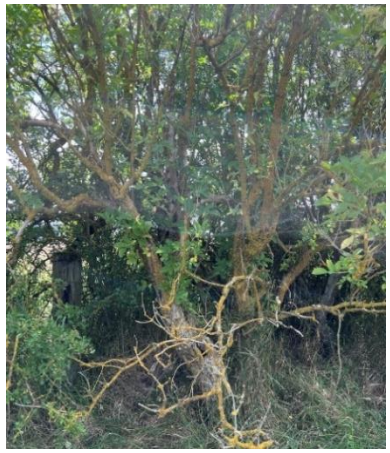
Static Detector	Grid Reference	Location Description	Photograph
A	NZ 29232 83372	Detector placed approximately 1 m above ground level within a semi-mature oak tree at edge of broadleaved woodland habitat.	
B	NZ 28971 83858	Detector positioned on fencepost at edge of woodland and adjacent to open field.	N/A
C	NZ 29359 83922	Detector positioned on fencepost at edge of woodland and adjacent to open field.	N/A
D	NZ 29688 83651	Detector fixed to a concrete fencepost, positioned at edge of woodland and adjacent to open field. Microphone positioned approximately 1 m above ground level.	

Appendix C Preliminary Roost Assessment Results

Table C-1: Preliminary Roost Assessment Results

Tree ID	Grid Reference	Description	Active Season Roost Suitability	Photograph
1	NZ 29177 83397	Mature sycamore, standing approximately 14m tall, with a bat box fixed to tree. No potential roost features identified on the tree itself.	High	

Tree ID	Grid Reference	Description	Active Season Roost Suitability	Photograph
2	NZ 29193 83410	Mature ash, standing approximately 14 m high, with cracked limbs and trunk on northern aspect of tree. Features could be inspected via aerial access (climbing).	High	
3	NZ 29199 83424	Standing deadwood, standing approximately 3 m high, with numerous cavities and cracks in the trunk and branches.	High	

Tree ID	Grid Reference	Description	Active Season Roost Suitability	Photograph
4	NZ 29058 83739	Elder approximately 4.5m high with cracked limbs and trunk and numerous cavities on east facing aspect. Tree would need to be surveyed from east side only as access to western aspect not possible. Feature could be inspected from ground level, or ladder with endoscope.	Moderate	
5	NZ 29242 83823	Elder with cracked limbs and trunk and numerous cavities on north facing aspect. Tree would need to be surveyed from east side only as access to western aspect not possible. Feature could be inspected from ground level (or using ladder) with endoscope.	Moderate	

Tree ID	Grid Reference	Description	Active Season Roost Suitability	Photograph
6	NZ 29279 83823	Elder with cracked limbs and trunk and numerous cavities on north facing aspect. Tree would need to be surveyed from east side only as access to western aspect not possible. Feature could be inspected from ground level (or with ladder) using endoscope.	Moderate	
7	NZ 29480 83781	Poplar with cracks in trunk, and cracks and cavities in limbs on eastern aspect of tree. Tree may be unsafe to climb due to angle – emergence/ re-entry survey likely required.	Moderate	

Tree ID	Grid Reference	Description	Active Season Roost Suitability	Photograph
8	NZ 29509 83751	Poplar with cracks in trunk, and cracks and cavities in limbs on eastern aspect of tree. Tree considered unsafe to climb – emergence/re-entry survey likely required.	Moderate	
9	NZ 29241 83424	Ash tree with cracked trunk and limbs, and cavities in limbs. Features on northern aspect of tree.	Moderate	

Tree ID	Grid Reference	Description	Active Season Roost Suitability	Photograph
10	NZ 29602 83799	Ash tree with cavity near base of trunk, approximately 1 m in length. Feature could be inspected from ground level with endoscope.	Moderate	
11	NZ 29811 83707	Poplar with vertical split from base of tree to approximately 5 m above ground level, on west facing aspect. May be possible to assess features via aerial inspection.	Moderate	

Tree ID	Grid Reference	Description	Active Season Roost Suitability	Photograph
12	NZ 29854 83687	Fallen dead tree with flaking bark and under branches and some small crevices towards base, on western aspect of tree.	Moderate	
13	NZ 29867 83673	Fallen poplar with split in trunk and cavities on south-east facing aspect.	Moderate	

Tree ID	Grid Reference	Description	Active Season Roost Suitability	Photograph
14	NZ 29954 83544	Standing dead birch tree with broken crown. Woodpecker holes present on south facing aspect. Unsafe to climb - tree would require emergence/ re-entry survey.	Moderate	
15	NZ 29972 83510	Poplar with woodpecker holes at height on west facing aspect. Cavity and flaking bark also present at height on southern aspect. Unsafe to climb - tree would likely require emergence/ re-entry survey.	Moderate	

Tree ID	Grid Reference	Description	Active Season Roost Suitability	Photograph
16	NZ 29975 83500	Popular within cavities approximately 2 m and 5 m above ground level on southern aspect.	Moderate	
17	NZ 29974 83502	Poplar with broken crown and exposed cavity approximately 2 m above ground level.	Moderate	

Appendix D Static Detector Results

Static Detector Results

Table D-1 Total number of bat passes, per species, recorded within the Site

Static ID	No. of Survey Nights	Common pipistrelle	Soprano pipistrelle	Nathusius pipistrelle	*Pipistrellus*	*Myotis*	Noctule	Leislers	*Nyctalus*	Total
A	25	5441	924	4	94	93	397	54	596	7603
B	25	1069	413	2	77	151	132	0	220	2064
C	12	1187	167	3	44	143	80	3	773	2400
D	25	739	203	2	57	640	26	0	39	1706
Total	**87**	**8436**	**1707**	**11**	**272**	**1027**	**635**	**57**	**1628**	**13773**

Table D-2 Average number of bat passes, per species, recorded within the Site

Static ID	No. Survey Nights	Common pipistrelle	Soprano pipistrelle	Nathusius pipistrelle	*Pipistrellus*	*Myotis*	Noctule	Leislers	*Nyctalus*
A	25	217.64	36.96	0.16	3.76	3.72	15.88	2.16	23.84
B	25	42.76	16.52	0.08	3.08	6.04	5.28	0.00	8.80
C	12	98.92	13.92	0.25	3.67	11.92	6.67	0.25	64.42
D	25	29.56	8.12	0.08	2.28	25.60	1.04	0.00	1.56
Total	**87**	**96.97**	**19.62**	**0.13**	**3.13**	**11.80**	**7.30**	**0.66**	**18.71**

Table D-3 Number of passes, per species, recorded at each static detector, per month

Month	Static ID	Common pipistrelle	Soprano pipistrelle	Nathusius pipistrelle	*Pipistrellus*	*Myotis*	Noctule	Leislers	*Nyctalus*	Total
May	A	123	18	2	4	4	1	0	0	152
	B	105	39	2	8	20	0	0	0	174
	C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D	129	27	0	10	89	0	0	0	255
May Total		**357**	**84**	**4**	**22**	**113**	**1**	**0**	**0**	**581**

Month	Static ID	Common pipistrelle	Soprano pipistrelle	Nathusius pipistrelle	*Pipistrellus*	*Myotis*	Noctule	Leislers	*Nyctalus*	Total
June	A	661	136	1	14	26	371	54	241	1504
	B	421	181	0	58	24	126	0	192	1002
	C	570	110	3	29	19	80	3	755	1569
	D	146	15	1	18	205	21	0	5	411
June Total		**1798**	**442**	**5**	**119**	**274**	**598**	**57**	**1193**	**4486**
July	A	1762	429	0	53	7	20	0	241	2512
	B	158	31	0	4	18	6	0	3	220
	C	265	41	0	9	100	0	0	18	433
	D	65	3	0	16	99	1	0	12	196
July Total		**2250**	**504**	**0**	**82**	**224**	**27**	**0**	**274**	**3361**
August	A	2382	249	1	21	28	4	0	80	2765
	B	159	82	0	3	34	0	0	19	297
	C	352	16	0	6	24	0	0	0	398
	D	228	98	0	11	182	4	0	15	538
August Total		**3121**	**445**	**1**	**41**	**268**	**8**	**0**	**114**	**3998**
September	A	513	92	0	2	28	1	0	34	670
	B	226	80	0	4	55	0	0	6	371
	C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D	171	60	1	2	65	0	0	7	306
September Total		**910**	**232**	**1**	**8**	**148**	**1**	**0**	**47**	**1347**

Table D-4 Average number of passes, per species, recorded at each static detector, per month

Month	Static ID	Common pipistrelle	Soprano pipistrelle	Nathusius pipistrelle	*Pipistrellus*	*Myotis*	Noctule	Leislers	*Nyctalus*
May	A	24.6	3.6	0.4	0.8	0.8	0.2	0	0
	B	21	7.8	0.4	1.6	4	0	0	0
	C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D	25.8	5.4	0	2	17.8	0	0	0
June	A	132.2	27.2	0.2	2.8	5.2	74.2	10.8	48.2
	B	91.5	35.25	0	11.5	3.75	30	0	48
	C	114	22	0.6	5.8	3.8	16	0.6	151
	D	29.2	3	0.2	3.6	41	4.2	0	1
July	A	352.4	85.8	0	10.6	1.4	4	0	48.2
	B	31.6	6.2	0	0.8	3.6	1.2	0	0.6
	C	53	8.2	0	1.8	20	0	0	3.6
	D	13	0.6	0	3.2	19.8	0.2	0	2.4
August	A	476.4	49.8	0.2	4.2	5.6	0.8	0	16
	B	31.8	16.4	0	0.6	6.8	0	0	3.8
	C	176	8	0	3	12	0	0	0
	D	45.6	19.6	0	2.2	36.4	0.8	0	3
September	A	102.6	14	0	2	0	30	0	9
	B	45.2	16	0	0.8	11	0	0	1.2
	C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	D	34.2	12	0.2	0.4	13	0	0	1.4

Table D-5 Median number of passes, per species, recorded at each static detector, per month

Month	Static ID	Common pipistrelle	Soprano pipistrelle	Nathusius pipistrelle	*Pipistrellus*	*Myotis*	Noctule	Leislers	*Nyctalus*
May	A	20	4	0	0	1	0	0	0
	B	21	7	0	1	4	0	0	0
	C	0	0	0	0	0	0	0	0
	D	23	4	0	2	18	0	0	0
June	A	101	29	0	2	2	30	0	9
	B	104.5	35	0	11	3	30	0	25.5
	C	89	14	0	4	3	11	0	187
	D	29	3	0	4	33	5	0	0
July	A	261	17	0	8	2	0	0	13
	B	28	4	0	1	3	1	0	0
	C	35	5	0	0	11	0	0	0
	D	4	0	0	4	4	0	0	0
August	A	372	21	0	4	5	1	0	16
	B	29	12	0	0	4	0	0	4
	C	176	8	0	3	12	0	0	0
	D	40	15	0	2	8	0	0	1
September	A	88	17	0	0	5	0	0	3
	B	37	14	0	0	8	0	0	1
	C	0	0	0	0	0	0	0	0
	D	42	11	0	0	8	0	0	1

Appendix E Weather Data

Table E-1 Weather data for each static detector survey night

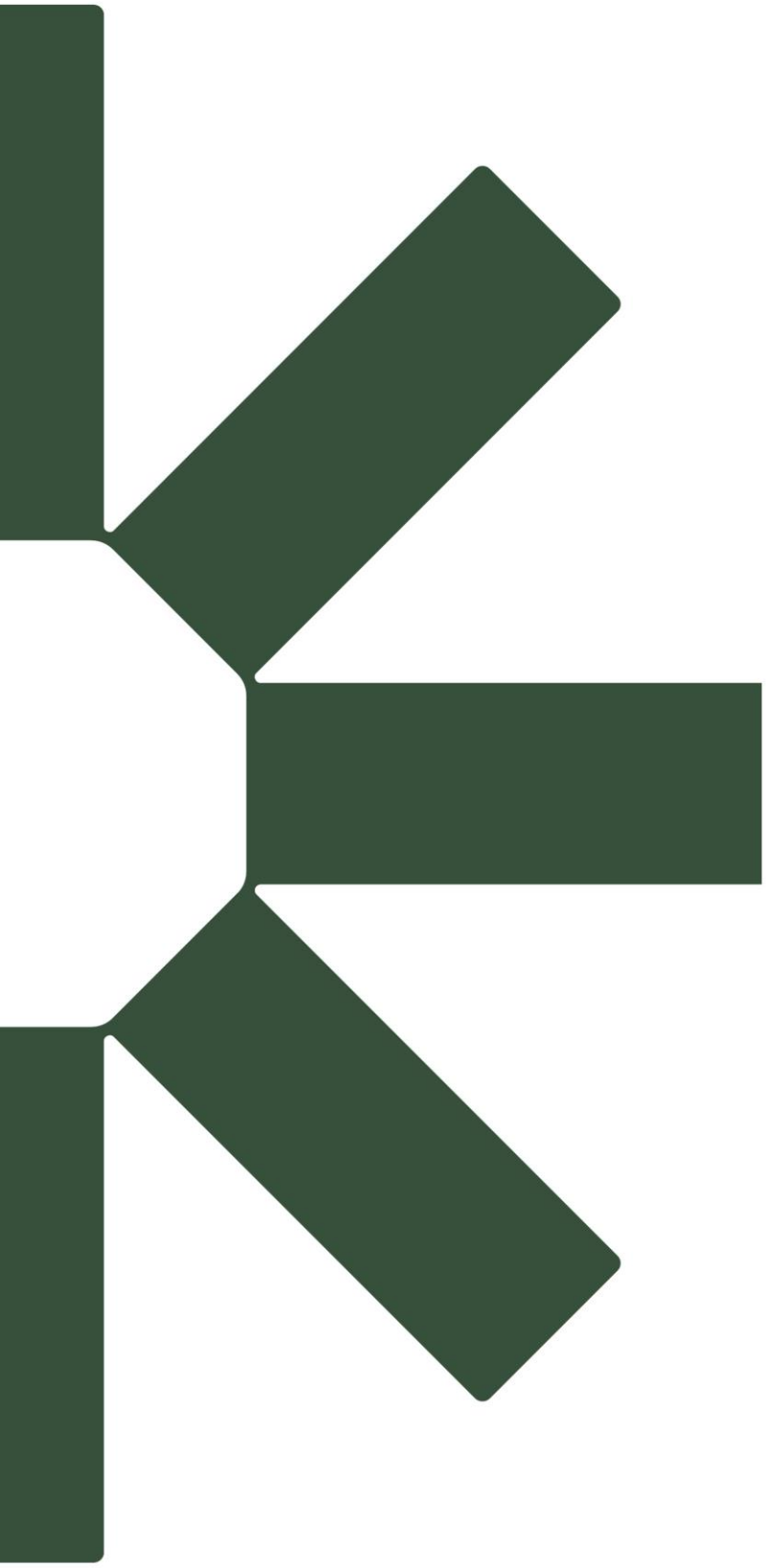
Date	Sunset - Sunrise	Time	Temperature (C)	Windspeed (m/s)	Rainfall rate (mm/hr)
26.05.23 – 27.05.23	21:25 - 04:39	21:11	13.8	2.2	0
		22:12	12.5	2.2	0
		23:12	11.6	2.2	0
		00:03	11.2	2.2	0
		01:04	10.6	2.2	0
		02:04	10.1	2.2	0
		03:04	9.7	3.3	0
		04:06	9.4	3.7	0
		05:06	9.6	5.5	0
27.05.23 – 28.05.23	21:27 - 04:38	21:24	17.7	2.2	0
		22:20	16.4	3.3	0
		23:20	14.6	2.2	0
		00:21	13.3	2.2	0
		01:22	12.5	2.2	0
		02:22	11.5	1.6	0
		03:23	11.4	2.2	0
		04:34	11.3	1.6	0
		05:04	11.2	2.2	0
28.05.23 - 29.05.23	21:28 - 04:37	21:24	11.8	1.6	0
		22:24	10.7	1.6	0
		23:25	10.1	1.6	0
		00:26	9	1.6	0
		01:26	8	1.6	0
		02:27	7.5	1.6	0
		03:38	6.6	1.6	0
		04:28	6.1	1.6	0
		05:09	5.8	1.6	0
29.05.23 - 30.05.23	21:30 - 04:36	21:30	12	1.6	0
		22:30	10.6	1.6	0
		23:32	9.3	1.6	0
		00:32	8.9	1.6	0
		01:33	8.3	1.6	0
		02:34	8.1	1.6	0
		03:34	7.7	1.6	0
		04:25	8.1	2.2	0
		05:05	8.6	2.2	0
30.05.23 - 31.05.23	21.31 - 04:35	21:35	13	2.2	0
		22:36	12.6	2.2	0
		23:27	12.3	1.6	0
		00:31	12.1	1.6	0
		01:31	12.1	1.6	0
		02:37	11.9	1.6	0

Date	Sunset - Sunrise	Time	Temperature (C)	Windspeed (m/s)	Rainfall rate (mm/hr)
		03:38	11.8	1.6	0
		04:38	11.6	2.2	0
21.06.23 - 22.06.23	21:49 - 04:25	21:44	19.9	3.3	0
		22:44	18.7	3.3	0
		23:45	17.2	3.3	0
		00:46	15.9	3.3	0
		01:46	14.9	3.3	0
		02:48	14.1	2.2	0
		03:48	13.6	2.2	0
		04:49	13.3	2.2	0
22.06.23 - 23.06.23	21:49 - 04.26	21:50	16.1	2.2	0
		22:51	15	2.2	0
		23:51	14.7	2.2	0
		00:52	14.5	3.3	0
		01:53	14.6	3.3	0
		02:53	14.6	3.3	0
		03:54	13.8	2.2	0
		04:25	13.5	2.2	0
		04:55	13.3	2.2	0
23.06.23 - 24.06.23	21:50 - 04:26	20:46	18.8	3.7	0
		21:57	18	3.3	0.1
		22:47	17.9	3.3	0
		23:48	17.9	3.3	0
		00:48	17.9	3.3	0
		01:37	18.1	4.9	0
		02:39	18	3.7	0
		03:40	17.8	3.3	0
		04:41	17.8	3.3	0
24.06.23 - 25.06.23	21:50 - 04:26	21:32	21.6	3.3	0
		22:33	19.8	3.3	0
		23:34	18.7	3.3	0
		00:34	17.7	3.3	0
		01:35	17.1	3.3	0
		02:36	16.8	2.2	0
		03:36	16.6	3.3	0
		04:37	16.1	2.2	0
25.06.23 - 26.06.23	21:50 - 04:27	21:34	15.4	2.2	0
		22:34	14.2	2.2	0
		23:35	14.3	3.3	0
		00:36	14.7	3.3	0
		01:33	14.4	3.3	0
		02:34	14.3	3.7	0
		03:34	13.9	3.3	0
		04:35	13.7	3.3	0

Date	Sunset - Sunrise	Time	Temperature (C)	Windspeed (m/s)	Rainfall rate (mm/hr)
23.07.23 - 24.07.23	21:25 - 04:59	21:29	13.2	2.2	0
		22:30	13	2.2	0
		23:23	12.6	2.2	0
		00:23	12.4	2.2	0
		01:24	12.3	2.2	0
		02:25	11.8	1.6	0
		03:25	11.1	1.6	0
		04:26	10.9	1.6	0
		04:56	11.3	2.2	0
24.07.23 - 25.07.23	21:24 - 05:01	21:26	13.3	2.2	0
		22:27	12.3	2.2	0
		23:27	11.7	1.6	0
		00:28	11.7	2.2	0
		01:29	11.3	1.6	0
		02:29	10.9	2.2	0
		03:30	10.6	1.6	0
		04:31	10.5	2.2	0
		05:01	10.4	2.2	0
		05:31	10.6	2.2	0
25.07.23 - 26.07.23	21:22 - 05:03	21:24	12.4	2.2	0.4
		22:24	12.4	2.2	0.1
		23:22	12.2	2.2	0.3
		00:23	11.7	1.6	0
		01:24	11.7	2.2	0
		02:24	12	2.2	0
		03:25	12.1	3.3	0
		04:26	12.3	3.3	0.1
		05:06	12.4	3.3	0
27.07.23 - 28.07.23	21:18 - 05:06	21:23	16.9	2.2	0.2
		22:24	17.1	3.3	0
		23:24	16.9	3.7	0
		00:25	16.8	3.3	0
		01:26	16.6	3.3	0
		02:26	16.4	3.3	0
		03:27	16.2	2.2	0
		04:28	15.8	3.3	0
		05:08	15.6	2.2	0
19.08.23 - 20.08.23	20:31 - 05:48	18:00	19	6.0	0
		21:00	17	7.0	0
		00:00	16	5.0	0
		03:00	16	4.0	0
		06:00	15	4.0	0
20.08.23 - 21.08.23	20:28 - 05:50	18:00	19	6.0	0
		21:00	16	5.0	0

Date	Sunset - Sunrise	Time	Temperature (C)	Windspeed (m/s)	Rainfall rate (mm/hr)
		00:00	15	4.0	0
		03:00	14	4.0	0
		06:00	15	4.0	0
21.08.23 - 22.08.23	20:26 - 05:52	18:00	19	6.0	0
		21:00	17	7.0	0
		00:00	16	6.0	0
		03:00	16	6.0	0
		06:00	16	6.0	0
22.08.23 - 23.08.23	20:23 - 05:54	18:00	16	13.0	0
		21:00	16	13.0	0
		00:00	16	9.0	0
		03:00	15	8.0	0
		06:00	15	7.0	0
31.08.23 – 01.09.23	20:01 - 06:11	20:02	15	-	0
		21:03	14.1	2.0 @ 2100hrs	0
		22:03	13.5	-	0
		23:04	13.6	-	0
		00:04	13.4	3.0 @ 0000hrs	0
		01:05	12.9	-	0
		02:05	13.2	-	0
		03:15	13.7	2.0 @ 0300hrs	0
		03:59	13.1	-	0
		05:33	12.8	-	0
		06:01	13.1	2.0 @ 0600hrs	0
		07:01	14	-	0
01.09.23 – 02.09.23	19:59 – 06:13	20:04	-	-	0
		21:04	15.7	2.0 @ 2100hrs	0
		22:05	15.4	-	0
		23:06	15.2	-	0
		00:06	15.1	1.0 @ 0000hrs	0
		01:07	14.9	-	0
		02:08	14.4	-	0
		03:08	14.3	0.0 @ 0300hrs	0
		04:09	13.8	-	0
		05:10	13.7	-	0
		06:09	13.8	1.0 @ 0600hrs	0
		06:20	13.9	-	0
02.09.23 – 03.09.23	19:56 – 06:15	19:52	17	-	0
		20:53	15.6	3.0 @ 21:00hrs	0
		21:54	15.4	-	0
		22:50	15.5	-	0
		23:51	15.1	3.0 @ 0000hrs	0
		00:52	14.8	-	0
		01:50	14.3	-	0

Date	Sunset - Sunrise	Time	Temperature (C)	Windspeed (m/s)	Rainfall rate (mm/hr)
		02:50	14	3.0 @ 0300hrs	0
		03:51	13.4	-	0
		04:52	12.3	-	0
		05:53	12.1	4.0 @ 0600hrs	0
		06:54	11.7	-	0
03.09.23 – 04.09.23	19:54 – 06:17	19:56	20.3	-	0
		20:57	18.2	3.0 @ 2100hrs	0
		21:57	16.6	-	0
		22:58	15.4	-	0
		23:59	14.2	3.0 @ 0000hrs	0
		00:59	13.2	-	0
		01:50	12.6	-	0
		02:55	12.1	2.0 @ 0300hrs	0
		04:05	11.7	-	0
		05:06	12.4	-	0.1
		06:06	12	3.0 @ 0600hrs	0
04.09.23 – 05.09.23	19:51 – 06:18	19:56	18.4	-	0
		20:57	16.9	1.0 @ 2100hrs	0
		21:57	16.1	-	0
		22:57	15.4	-	0
		23:58	15.3	2.2 @ 0000hrs	0
		00:57	14.7	-	0
		01:58	14.5	-	0
		02:58	14.2	2.0 @ 0300hrs	0
		03:59	13.8	-	0
		05:00	13.2	-	0
		06:00	12.6	2.0 @ 0600hrs	0
		06:20	12.4	-	0



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