Butterfly Solar Farm

on behalf of RWE Renewables UK Ltd.

Appendix 5-5: Bat Survey Report

avian ecology

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CONTENTS

ANNEXES

1 INTRODUCTION

1.1 Background and Scope

1.1.1 Avian Ecology Ltd. was commissioned by Axis Ltd on behalf of RWE Renewables Ltd to undertake baseline bat surveys, in relation to a proposed solar energy generating station, and associated on-site Battery Energy Storage System (BESS) (the 'Proposed Development') located on land to the north of the B5426, Wrexham (the 'Site') as shown on **Figure 7-6**. The Proposed Development also includes the associated infrastructure and connection to the Legacy National Grid substation.

1.1.2 This Technical Appendix has been prepared to accompany Chapter 5 of the Environmental Statement (ES) and presents survey methodology and results of surveys undertaken to establish baseline conditions with regards to bat species on-Site.

1.1.3 Only common names of bat species are used within this report, with scientific names provided in **Annex 1**.

2 METHODOLOGY

2.1 Overview

2.1.1 The approach to baseline information gathering with regards to bats has been undertaken with reference to Bat Conservation Trust (BCT) Survey Guidelines (Collins, 2023[1]), in addition to the Bat Mitigation Guidelines (Reason, P.F. & Wray, S, 2023[2]), and Bat Workers Manual (Mitchell-Jones, A. J. & McLeish, A. P, 2004[3]).

2.1.2 Additional pieces of guidance and peer reviewed literature have also been consulted and are referenced where relevant.

2.2 Field Surveys

2.2.1 The purpose of the baseline field surveys has been to establish the following:

- bat species assemblage using the Site;
- the spatial and seasonal distribution of bat activity; and
- the suitability, location and extent of commuting and foraging habitat used by bats; and,
- the locations of any bat roosts that could potentially be affected by the Proposed Development.

2.2.2 As such, the following assessment and/or baseline surveys have been completed:

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

[2] 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.

[3] Mitchell-Jones, A. J. & McLeish, A. P. (2004). *Bat Workers Manual*. 3rd Edition. Joint Nature Conservation Committee, Peterborough.

- Habitat Suitability Assessment (HSA).
- Manual Bat Activity Surveys (i.e., Night-time Bat Walkovers).
- Automated Bat Activity Surveys (i.e., static detector surveys).

2.2.3 Bat activity survey effort was determined in reference to BCT guidance (Collins, 2023) following an assessment of **Moderate** habitat suitability for the overall Site (**3.1 Habitat Suitability Assessment**).

2.2.4 As such, night-time bat walkovers (NBW) (i.e., manual bat activity surveys) were undertaken on a seasonal basis (i.e. spring, summer and autumn).

2.2.5 Static detector surveys (i.e., automated bat activity surveys) were undertaken on a monthly basis throughout the established bat activity period (April to October).

2.2.6 Methodologies relating to each specific bat activity survey are described below.

Habitat Suitability Assessment

2.2.7 A habitat suitability assessment (HSA) of the Site was undertaken in reference to criteria detailed in **Table 4.1** of BCT guidance (Collins, 2023), which provided an appraisal of the potential value of habitats located within the Site relative to foraging and commuting potential.

Bat Activity Surveys

Night-time Bat Walkover Surveys

2.2.8 The NBW surveys were designed and implemented with reference to BCT guidance (Collins, 2023) and were informed by a prior baseline survey acting in lieu of a Daytime Bat Walkover (DBW). The NBW surveys were undertaken using four transect routes in total, as presented in **Figure 7-6**.

2.2.9 NBW transect routes were designed to cover the recommended transect length (i.e., 3-5km) relative to the size of the Site, to be completed within 2-3 hours after sunset. Where possible, transect routes were also designed to cover a representative range of habitats and ecological features present within and bordering the Site (as determined by accessibility).

2.2.10 NBW surveys were scheduled on a seasonal basis, in accordance with the recommended effort for habitats assessed as having Moderate suitability for foraging and commuting bats, and conducted during periods of suitable weather conducive for bat activity (i.e., mild and dry, with relatively low wind speeds).

2.2.11 Each NBW incorporated an initial 30–60-minute vantage point (VP) observation period, commencing at sunset during which potential bat activity was observed and recorded; vantage point locations were informed by prior Site walkovers, and were determined based on favourable locations which might support potential roost sources and/or flight-lines. Should emergence activity or large numbers of directionally commuting bats be observed, this methodology encourages surveyors to investigate possible emergence locations via back tracking within this initial VP period.

2.2.12 Post-VP observation, surveyors walked a pre-determined transect route, utilising a full spectrum Wildlife Acoustics Echo Meter Touch 2 Pro detector, and in some instances a night-vison aid (NVA); this equipment allowed for both acoustic recordings and observations of activity to be recorded, allowing for bat identification and a time-stamped narrative of activity to be spatially logged.

2.2.13 During each NBW, particular emphasis was placed on recording observed activity (e.g., numbers of bats, behaviour, habitat usage etc.) for the purpose of understanding how bats are using the Site, and to help further inform a response to proposed impacts. Whilst the transect routes were pre-determined, flexibility was enabled, permitting some deviation from redefined transect route to allow for a better understanding of bat activity on Site

2.2.14 A summary of NBW survey effort is presented in **Table 2.1** below.

Table 2.1: *A summary of NBW survey effort, per transect area.*

Survey Date	Transect ID	Sunset Time	Field Surveyors	Start Time	End Time	Survey Conditions
10/10/2023	T1	18:28	A Hulme; F. Wilde	18:30	20:35	Temperature: 18°C Precipitation: 0; Wind[4]: Light breeze (2) Cloud Cover: 6/8
	T2		A Tomlinson; G. Smith	18:26	20:30	
	T3		A Logan; J Stevens	18:28	20:34	
	T4		L. Quarton; H Davies	18:28	20:40	
23/05/2024	T1	21:14	A Hulme; P. Baker	21:14	23:28	Temperature: 12°C Precipitation: 0; Wind: Light breeze (2) Cloud Cover: 8/8
	T2		A Tomlinson; F Wilde	21:15	23:16	
	T3		J. Stevens; K. Love	21:16	23:25	
	T4		L. Quarton; C. Dean	21:14	23:28	
01/08/2024	T1	21:05	A Crone; H. Slinger	21:05	23:50	Temperature: 17°C Precipitation: 0; Wind: Gentle breeze (3) Cloud Cover: 4/8
	T2		Z. Hinchcliff; F. Wilde	21:05	22:45	
	T3		J. Stevens; subcontractor	21:03	23:07	
	T4		L. Quarton; H. Davies	21:05	23:25	

[4] Beaufort wind scale.

Automatic Bat Activity Surveys

2.2.15 Eight automated monitoring stations (MSs) were deployed within the Site boundary.

2.2.16 MS locations were chosen to sample activity from a representative range of habitats within the Site (where accessible), including features considered to be potentially ecologically important for bats.

2.2.17 A summary of MS locations is detailed in **Table 2.2** below, and presented in **Figure 7-6**.

Table 2.2: *A summary of static monitoring station (MS) deployment.*

MS ID	Grid Reference	Habitat
MS1	SJ 31670 46343	Edge habitat; placed at an intersection between two linear features (i.e., a mature hedgerow and line of trees), within the western area of the Site (T2). Adjacent habitats primarily included open grazing pasture.
MS2	SJ 31713 46533	Linear feature; placed along a defunct hedgerow running parallel with a shallow stream, within the Site's western area (T2). Adjacent habitats primarily included open grazing pasture.
MS3	SJ 34117 46135	Edge habitat; placed close to the intersection between two linear features (i.e., mature hedgerows with trees), within the northern area of the Site (T4). Adjacent habitats primarily included open pasture and arable crop.
MS4	SJ 34213 45623	Edge habitat; placed along a mature treeline, in association with an off-Site area of linear woodland, within the northern area of the Site (T4). Adjacent habitats primarily included open pasture and woodland edge.
MS5	SJ 34070 45468	Edge habitat; placed along a linear feature (i.e., hedgerow with trees), within the southern area of the Site (T3). Adjacent habitats primarily included open pasture and arable crop, with woodland edge found in relative proximity.
MS6	SJ 33901 45379	Edge habitat; placed along a linear feature (i.e., hedgerow with trees), within the southern area of the Site (T3). Adjacent habitats primarily included open pasture and arable crop.
MS7	SJ 36647 45921	Edge habitat; place at edge of linear woodland block, within the Site's eastern area (T1). Adjacent habitats primarily included open pasture and arable crop.
MS8	SJ 37158 46202	Open habitat; placed along fence line within open parcel of the Site's eastern area (T1). Adjacent habitats primarily included open pasture and arable crop.

2.2.18 Static detectors deployed at MS locations during activity surveys consisted of either a full spectrum Wildlife Acoustics Song Meter (SM) Mini or Song Meter 2 (SM2) detector attached at a minimum hight of 1m to a suitable on-Site feature.

2.2.19 Surveys were undertaken between time periods spanning approximately thirty minutes before sunset to thirty minutes after sunrise, with detectors set to record simultaneously.

2.2.20 Where possible, bat activity was sampled per month for a minimum of five consecutive nights of suitable weather, in line with the minimum recommended survey effort prescribed for sites assessed to have **Moderate** habitat suitability for foraging and commuting bats (Collins, 2023).

2.2.21 Key metrics for each MS deployed throughout automatic activity surveys are detailed in **Table 2.3.**

Table 2.3: *A summary of automated activity survey effort.*

MS ID	Recording Period	Start Date	End Date	No. Nights Surveyed	Recording Hours
MS1	April	18/04/2024	30/04/2024	12	113.25
	May	16/05/2024	23/05/2024	7	55.5
	June	14/06/2024	21/06/2024	7	49
	July	12/07/2024	19/07/2024	7	53
	August[5]	01/08/2024	04/08/2024	3	25.5
	September	16/09/2024	23/09/2024	7	81.25
	October	03/10/2023	10/10/2023	7	88.75
MS2	April	18/04/2024	30/04/2024	12	113.25
	May	16/05/2024	23/05/2024	7	55.5
	June	14/06/2024	21/06/2024	7	49
	July	12/07/2024	19/07/2024	7	53
	August	01/08/2024	09/08/2024	8	69
	September	16/09/2024	23/09/2024	7	81.25
	October	03/10/2023	10/10/2023	7	88.75
MS3	April	18/04/2024	30/04/2024	12	113.25
	May	16/05/2024	23/05/2024	7	55.5
	June	14/06/2024	21/06/2024	7	49
	July	12/07/2024	19/07/2024	7	53
	August	01/08/2024	09/08/2024	8	69
	September	16/09/2024	23/09/2024	7	81.25
	October	03/10/2023	10/10/2023	7	88.75
MS4	April	18/04/2024	27/04/2024	9	85.75
	May	16/05/2024	23/05/2024	7	55.5
	June	14/06/2024	21/06/2024	7	49
	July	12/07/2024	19/07/2024	7	53
	August	01/08/2024	09/08/2024	8	69

[5] Recording period fell short of five days due to detector failure.

MS ID	Recording Period	Start Date	End Date	No. Nights Surveyed	Recording Hours
	September[6]	16/09/2024	20/09/2024	4	46
	October	03/10/2023	10/10/2023	7	88.75
MS5	April	18/04/2024	30/04/2024	12	113.25
	May	16/05/2024	23/05/2024	7	55.5
	June	14/06/2024	21/06/2024	7	49
	July[7]	N/A	N/A	0	0
	August	01/08/2024	09/08/2024	8	69
	September	16/09/2024	23/09/2024	7	81.25
	October	03/10/2023	10/10/2023	7	88.75
MS6	April	18/04/2024	30/04/2024	12	113.25
	May	16/05/2024	23/05/2024	7	55.5
	June	14/06/2024	21/06/2024	7	49
	July	12/07/2024	19/07/2024	7	53
	August	01/08/2024	09/08/2024	8	69
	September	16/09/2024	23/09/2024	7	81.25
	October	03/10/2023	10/10/2023	7	88.75
MS7	April	18/04/2024	30/04/2024	12	113.25
	May	16/05/2024	23/05/2024	7	55.5
	June	14/06/2024	21/06/2024	7	49
	July	12/07/2024	19/07/2024	7	53
	August	01/08/2024	09/08/2024	8	69
	September	16/09/2024	23/09/2024	7	81.25
	October	03/10/2023	10/10/2023	7	88.75
MS8	April	18/04/2024	30/04/2024	12	113.25
	May	16/05/2024	23/05/2024	7	55.5
	June	14/06/2024	21/06/2024	7	49
	July	12/07/2024	19/07/2024	7	53
	August	01/08/2024	09/08/2024	8	69

[6] Recording period fell short of five days due to disturbance.

[7] Detector failure due to technical error.

MS ID	Recording Period	Start Date	End Date	No. Nights Surveyed	Recording Hours
	September	16/09/2024	23/09/2024	7	81.25
	October	03/10/2023	10/10/2023	7	88.75

2.2.22 Weather conditions, taken from World Weather Online[8] are presented in **Annex 2.**

2.3 Data Analysis and Assumptions of Bat Activity

Acoustic Analysis

2.3.1 Data analysis and interpretation of results followed the principles presented in the BCT guidance (Collins, 2023). Data analysis was undertaken by L. Quarton *MSc BSc* (Hons.), an experienced bat ecologists who regularly carries out analysis of bat survey data.

2.3.2 Bat detectors recorded data onto digital media and were analysed using Kaleidoscope Pro (Wildlife Acoustics) software. Kaleidoscope Pro automatically identified sonograms, and a manual check was conducted to confirm species identified. Bat species were identified using diagnostic features (e.g., frequency, slope, duration, time between calls, minimum call length etc.).

2.3.3 For the purpose of sonogram analysis, the number of 'bat registered calls' were defined as a sequence of echolocation calls consisting of two or more call notes (pulse of frequency), not separated by more than one second (White and Gehrt, 2001 and Gannon et al., 2003), with a minimum call note length of two milliseconds (Weller et al., 2009).

Bat Activity Index

2.3.4 An individual bat can pass a particular feature on several occasions while foraging. As such, it is not possible to estimate the number of individual bats or draw a fair comparison where survey times differ.

2.3.5 In response, bat activity as presented within this technical appendix is recorded as an index, accounting for bat pass rate per hour or a 'Bat Activity Index (BAI)', as outlined BCT guidance (Collins, 2023), and defined as follows:

BAI (per hour): Total number of registered bat calls / total number of recording hours

2.3.6 BAI presented herein is a measure of total pass rate per hour relative to each MS location and recording period for both the combined bat assemblage and individual species recorded, accounting for both spatial and temporal activity across the survey effort

[8] https://www.worldweatheronline.com/ [Accessed 13/02/25].

2.4 Limitations

Bat Activity Surveys

RLB Amendments

2.4.1 As the scheme design has progressed the planning red line boundary has changed, and as such the survey area has included areas that are now outside of the Site. As all areas proposed for solar arrays have been surveyed this is not considered a limitation to the assessment.

Monitoring Station Failure

2.4.2 Due to technical issues, the detector located at MS5 failed to record during the July survey period. As such, it is not possible to make a direct comparison of activity across all detectors for the month of July or between months at MS5. However, habitats of similar character and/or proximity (e.g., MS4) were successful during the July period, and provide insight in lieu of MS5. As such, the failure of a single detector in July is not considered to be a substantial limitation to the baseline data assessment.

Survey Effort

2.4.3 During the August survey period, MS1 fell short of the recommended survey effort (i.e., five consecutive nights) by two nights due to technical failure. However, during this deployment period, MS4 accounted for the maximum number of species recorded at the deployment location and accounted for high BAI activity relative to some species (i.e., soprano pipistrelle). As such, data collected still provides insight into species presence, distribution and relative activity for the recording period, and is not considered a substantial limitation to baseline data assessment.

2.4.4 Additionally, MS4 fell short of the recommended survey effort (i.e., five consecutive nights) by a single night due to disturbance. However, data collected confirmed the continued presence of most species previously recorded at the location (apart from lesser horseshoe) and still provides distribution and relative activity for the recording period, with an under recording of a single night not considered a substantial limitation to baseline data assessment.

Weather Conditions

2.4.5 BCT guidance (Collins, 2023) recommends activity surveys be carried out in the following conditions: temperature above 10°C at sunset and with no rain or strong wind. For the purpose of this assessment, strong wind is considered to be anything above 5m/s.

2.4.6 During the spring, summer and autumn NBW surveys, weather conditions were noted to be within the recommended range for each weather parameter; consequently, no limitations in regard to conditions on-Site were recorded during the manual bat activity surveys.

2.4.7 However, the suitability of weather conditions during automatic activity surveys was variable, with fourteen surveyed nights noted to have been undertaken when at least one of the parameters would be considered sub-optimal, most of which occurred during the April recording period (**Annex 2**). However, bat activity was recorded on all fourteen of these nights. As such, all survey nights that recorded bat activity have been included within the automated survey analysis.

Acoustic Analysis

2.4.8 Kaleidoscope software can identify certain bat species from sonograms, but some species within the *Myotis* and *Nyctalus* genus can be difficult to distinguish. In some cases, calls may be partially heard or distorted by external factors like passing cars, rain or wind, resulting in unknown or genus-only labels. Likewise, species such as brown long-eared bat have lower detectability and may not be detected during activity surveys relative to their hunting strategies in less open habitats. Survey results have been carefully interpreted across species.

2.4.9 Additionally, a number of *Pipistrellus* social calls were recorded over the survey effort; whilst social call components can broadly be distinguished between species, calls still show variation within and between species, and in the absences of additional diagnostic features (i.e., an echolocation call), and in light of the confirmed presence of both common and soprano pipistrelle on-Site, these calls have been identified broadly as *Pipistrellus* call registrations, and analysed accordingly.

3 RESULTS

3.1 Habitat Suitability Assessment

3.1.1 The Site is primarily comprised of open habitat types, which mostly include large areas of grassland pasture and arable crop. However, linear features (i.e., hedgerows, treelines and associated diches) are commonly distributed across field margins and Site boundaries. Localised areas of woodland and woodland edge habitat are also present both on-Site and directly adjacent. As such, viable habitat capable of supporting a variety of bat guilds is present on Site, although variable in both suitability, distribution and scale

Foraging

3.1.2 Open foraging habitat present within the Site is noted to be continuous but is of variable quality. Grassland areas are generally of limited diversity in terms of both species and structural composition, and subject to frequent disturbance (e.g., mowing or grazing). Cropland areas are of negligible foraging suitability. However, localised areas of open habitat feature increased ecological value (e.g., mesic grassland) but are proportionally minor in scope.

3.1.3 However, edge habitats (e.g., field margins) which include wooded linear and woodland edges (e.g., hedgerows and treelines) within the Site provide increased foraging suitability, and represent a valuable resource within the local landscape. Standing water bodies (i.e., ponds) are occasionally found in association with these areas, providing additional foraging niches.

3.1.4 Closed foraging habitat is relativley scare within the Site proper, although what areas are present are of suitable age and character to provide additional foraging resources for specialist species, whilst boundary habitats, such as the Well Wood located centrally to the Site, are likely to represent ecological important features relative to the Site, and local landscape.

Commuting

3.1.5 Mature wooded linear features are frequently distributed throughout and bordering the Site providing sheltered flightpaths. As such, connectivity is well-established between the Site and habitats within the wider landscape (e.g., woodland parcels, standing waterbodies, wooded and blue linear features etc.), in addition to potential roosting opportunities associated with both natural and urban habitats found locally. Likewise, open habitat present on-Site does not represent a significant barrier to commuting for open or generalist species.

Roosting Opportunities

3.1.6 Mature trees found in association with linear features (i.e., hedgerows and treelines) are frequently distributed across the Site area, most of which are of sufficient age and character to support PRFs. Likewise, localised areas of woodland habitat and free-standing trees present on-Site or adjoing offer additional potential roost resources, whilst the distribution of linear features, which function as direct flightpaths to potential roost features possibly on-Site and within the local landscape.

Summary

3.1.7 In reference to BCT guidance (Collins, 2023), the Site is considered to have **Moderate** habitat suitability based on its overall commuting and foraging value for bat species, in addition to its potential as a possible roost resource relative to the local landscape.

3.2 Night-time Bat Walkovers

3.2.1 Species recorded during each NBW per transect area, in addition to call total call registrations, are presented in **Table 3.4**.

3.2.2 Call registrations for each species per season are further presented in **Table 3.5**, relative to each transect area.

NBW Species Overview

3.2.3 Collectively, NBW surveys recorded at least five species on Site: common pipistrelle, soprano pipistrelle, noctule, brown long-eared bat and *Myotis* bats.

3.2.4 Species presence was recorded uniformly between transect areas for the collective NBW survey effort, apart from brown long-eared bat going undetected across T4.

3.2.5 Likewise, species presence was recorded uniformly between seasons for the collective NBW survey effort, apart from brown long-eared bat going undetected across transect areas during spring NBWs.

3.2.6 However, species presence between seasons at individual transect areas showed variation, in addition to activity metrics (i.e., total call registrations and proportion of call registrations per species) also being variable (**Table 3.5**).

NBW Activity Distribution

Transect 1

3.2.7 Bat activity was frequently recorded in association with wooded linear features or woodland parcels, although some activity was also noted relative to open pasture and cropland (i.e., soprano and *Myotis* species passes) (**Figure 7-6**).

3.2.8 Per species, common pipistrelle, soprano pipistrelle and *Myotis* bats were relatively well distributed across the transect area, whilst noctule and brown long-eared bat activity was relatively localised.

3.2.9 Observed foraging and commuting activity was limited to common and soprano pipistrelle, in association with linear fear feature and woodland edges.

Transect 2

3.2.10 Bat activity was frequently recorded in association with wooded linear features, although some activity was also noted relative to open pasture (**Figure 7-6**).

3.2.11 Per species, common and soprano pipistrelle activity was relatively well distributed across the transect area, whilst noctule and *Myotis* activity was generally recorded in association with the southern transect area.

3.2.12 Likewise, observed foraging and commuting activity was noted for common pipistrelle, soprano pipistrelle, noctule and *Myotis* bats, generally in association with wooded linear featured, with limited foraging observed relative to open pasture (i.e., common pipistrelle).

Transect 3

3.2.13 Bat activity was frequently recorded in association with wooded linear features and adjacent woodland parcels, although limited activity was also noted relative to open pasture (**Figure 7-6**).

3.2.14 Per species, common and soprano pipistrelle activity was relatively well distributed across the transect area. Noctule activity was noted to be less widespread, whilst *Myotis* and brown long-eared bat activity was generally recorded centrally to the transect route

3.2.15 Likewise, observed foraging and commuting activity was noted for common pipistrelle, soprano pipistrelle, noctule and *Myotis* bats, but was limited to wooded linear features and woodland edge.

Transect 4

3.2.16 Bat activity was frequently recorded in association with wooded linear features and adjacent woodland parcels, although limited activity was also noted relative to open pasture (i.e., *Myotis* bats) (**Figure 7-6**).

3.2.17 Per species, common and soprano pipistrelle activity was relatively well distributed across the transect area, whilst noctule and *Myotis* bat activity was relatively localised.

3.2.18 Likewise, observed foraging and commuting activity was noted for common pipistrelle, soprano pipistrelle and *Myotis* bats, but was limited to wooded linear features and woodland edge.

Table 3.4: *Summary of bat activity metrics per NBW transect, for combined survey effort.*

Transect ID	Species / Genus	NBW Transect Metrics	
		No. Registered Calls	Percentage (%)
T1	Common pipistrelle	41	19.16
	Soprano pipistrelle	147	73.36
	Noctule	5	2.34
	Myotis spp.	10	4.67
	Brown long-eared	1	0.47
	Total	214	100.00
T2	Common pipistrelle	26	19.26
	Soprano pipistrelle	40	29.63
	Noctule	61	45.19
	Myotis spp.	7	5.19
	Brown long-eared	1	0.74
	Total	135	100.00

Transect ID	Species / Genus	NBW Transect Metrics	
		No. Registered Calls	Percentage (%)
T3	Common pipistrelle	65	17.11
	Soprano pipistrelle	268	70.53
	Noctule	15	3.95
	Myotis spp.	31	8.16
	Brown long-eared	1	0.26
	Total	380	100.00
T4	Common pipistrelle	100	22.42
	Soprano pipistrelle	329	73.77
	Noctule	12	1.12
	Myotis spp.	5	2.69
	Total	446	100.00

Table 3.5: *Summary of bat activity metrics per NBW transect, per season.*

Transect ID	Survey Date	Species / Genus	NBW Transect Metrics	
			No. Registered Calls	Percentage (%)
T1	10/10/23	Common pipistrelle	12	18.75
		Soprano pipistrelle	47	73.44
		Myotis spp.	4	6.25
		Brown long-eared	1	1.56
		Total	64	100.00
	23/05/24	Common pipistrelle	29	22.14
		Soprano pipistrelle	99	75.57
		Noctule	3	2.29
		Total	131	100.00
	01/08/24	Soprano pipistrelle	11	57.89
		Noctule	2	10.53
		Myotis spp.	6	31.58
		Total	19	100.00
T2	10/10/23	Common pipistrelle	7	15.22
		Soprano pipistrelle	32	69.57

Transect ID	Survey Date	Species / Genus	NBW Transect Metrics	
			No. Registered Calls	Percentage (%)
		Myotis spp.	6	13.04
		Brown long-eared	1	2.17
		Total	46	100.00
	23/05/24	Common pipistrelle	19	38.00
		Soprano pipistrelle	4	8.00
		Noctule	26	52.00
		Myotis spp.	1	2.00
		Total	50	100.00
	01/08/24	Soprano pipistrelle	4	10.26
		Noctule	35	89.74
		Total	39	100.00
T3	10/10/23	Common pipistrelle	8	8.89
		Soprano pipistrelle	81	90.00
		Noctule	1	1.11
		Total	90	100.00
	23/05/24	Common pipistrelle	39	18.31
		Soprano pipistrelle	145	68.08
		Noctule	8	3.76
		Myotis spp.	21	9.86
		Total	213	100.00
	01/08/24	Common pipistrelle	18	23.38
		Soprano pipistrelle	42	54.55
		Noctule	6	7.79
		Myotis spp.	10	12.99
		Brown long-eared	1	1.30
		Total	77	100.00
T4	10/10/23	Common pipistrelle	2	3.77
		Soprano pipistrelle	51	96.23
		Total	53	100.00

Transect ID	Survey Date	Species / Genus	NBW Transect Metrics	
			No. Registered Calls	Percentage (%)
	23/05/24	Soprano pipistrelle	62	28.57
		Noctule	153	70.51
		Myotis spp.	2	0.92
		Total	217	100.00
	01/08/24	Common pipistrelle	36	20.45
		Soprano pipistrelle	125	71.02
		Noctule	5	2.84
		Myotis spp.	10	5.68
		Total	176	100.00

3.3 Automatic Activity Survey

Species Assemblage

3.3.1 Bat activity was detected on-Site during all 55 nights comprising the survey effort (i.e., over the duration of detector deployment, between April-October deployment periods).

3.3.2 Overall, bat calls indicative of a minimum of six species / genus of bats were detected, accounting for a total of 84,036 call registrations. Social calls of pipistrelle species were also recorded but were not identified to species level, these are likely attributable to common and soprano pipistrelle.

3.3.3 **Table 3.6** summarises the overall number of registered calls recorded, the percentage of registered calls, and the total BAI (passes per hour) per species for the overall Site.

3.3.4 Soprano pipistrelle accounted for the highest number of registered calls detected on-Site (36547 passes) accounting for 43.49% of total call registrations, and a BAI of 9.33 passes per hour.

3.3.5 Common pipistrelle accounted for the second highest number of registered call (30234 passes) accounting for 35.98% of total call registrations, and a BAI of 7.72 passes per hour.

3.3.6 Comparably, additional species detected on Site comprised a relatively smaller number of total call registrations, proportion of call registrations and pass rate (**Table 3.6**).

Table 3.6: *Total bat passes and percentage of passes, per-species[9].*

Species/Genus	Total No. Registered Calls	Percentage of Total Calls (%)	Total BAI (per Species)
Common pipistrelle	30,234	35.98	7.72
Soprano pipistrelle	36547	43.49	9.33
Pipistrellus spp.	1,025	1.22	0.26

[9] The 'total' percentage may be slightly above 100% due to rounding of the percentages per species.

Species/Genus	Total No. Registered Calls	Percentage of Total Calls (%)	Total BAI (per Species)
Noctule	4,521	5.38	1.15
Myotis spp.	9,780	11.64	2.50
Brown long-eared	1,921	2.29	0.49
Lesser horseshoe	8	0.01	<0.01
Total	**84,036**	**100.00**	**21.44**

Combined Assemblage

Bat Activity per Monitoring Station

3.3.7 A summary of the spatial distribution of call registrations and the frequency of recorded activity relative to survey effort for the combined bat assemblage recorded on-Site, is summarised in **Table 3.7** and illustrated on **Graph 3.1**.

Total BAI per MS (Combined Assemblage)

3.3.8 Bat activity was recorded at all eight MS locations surveyed on-Site.

3.3.9 Proportionally, MS1 and MS4 accounted for the highest percentage of call registrations recorded for the combined assemblage, accounting for 25.08% and 24.06% of total call registrations, respectively.

3.3.10 Likewise, MS1 and MS4 accounted for the highest total BAI for the combined assemblage, equating to a pass rate of 45.21 and 45.24 passes per hour, respectively.

3.3.11 Total BAI and recorded activity at other MS locations was noted to be variable, ranging from a BAI of 6.05 to 21.44 passes per hour.

Frequency per MS (Combined Assemblage)

3.3.12 Bat activity (when considered cumulatively for the combined bat assemblage) was recorded on-Site at a minimum of one MS location during each night of the survey effort, and during most nights sampled per individual MS location (98.82% of cumulative nights sampled); however, individual MS locations showed some variation in the frequency of recorded activity (**Table 3.7**).

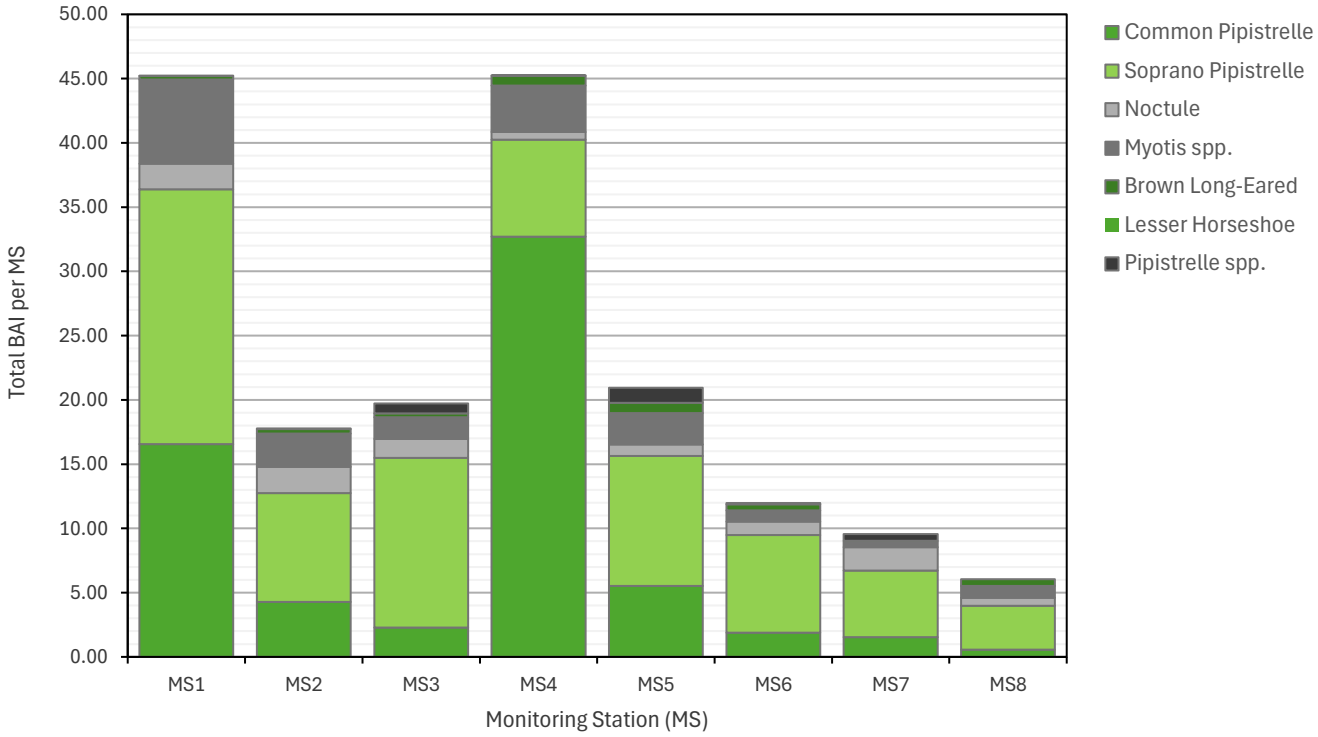
3.3.13 Per individual MS location, MS1, MS3 and MS4 accounted for the highest percentage of nights with recorded activity, each accounting for 100% of nights surveyed.

Table 3.7: *Bat activity survey results per monitoring station (MS)[10] for the combined species assemblage.*

MS ID	No. Nights Sampled	No. Nights Bats Recorded	Percentage Nights Bats Recorded	Total No. Passes	Percentage Distribution Passes (%)	Total Assemblage BAI (per MS)
MS1	50	50	100.00	21,080	25.08	45.21
MS2	55	54	98.18	9,051	10.77	17.76
MS3	55	55	100.00	10,050	11.96	19.72

[10] The number of dates sampled is the number of nights each detector was operational for throughout the survey period, taking account of detector failures and unsuitable weather conditions.

MS ID	No. Nights Sampled	No. Nights Bats Recorded	Percentage Nights Bats Recorded	Total No. Passes	Percentage Distribution Passes (%)	Total Assemblage BAI (per MS)
MS4	49	49	100.00	20,223	24.06	45.24
MS5	48	47	97.92	9,564	11.38	20.94
MS6	55	54	98.18	6110	7.27	11.99
MS7	55	54	98.18	4873	5.80	9.56
MS8	55	54	98.18	3085	3.67	6.05
Total	**422**	**417**	98.82%	84,036	100.00	21.44



Graph 3.1: *Total BAI (pass per hour) per monitoring station (MS) for the overall survey effort.*

Bat Activity per Recording Period

3.3.14 A summary of monthly distribution of call registrations, in addition to frequency of recorded activity relative to survey effort for the combined bat assemblage recorded on-Site, is summarised in **Table 3.8** and illustrated on **Graph 3.2**.

Total BAI per Recording Period (Combined Assemblage)

3.3.15 Bat activity was recorded on-Site during each monthly recording period surveyed (i.e., April-October).

3.3.16 Proportionally, April[11] and October accounted for the highest percentage of total call registrations per month for the combined assemblage, accounting for 20.39% and 17.74% of total call registration, respectively.

3.3.17 However, June and July accounted for the highest total BAI for the combined assemblage, equating to a pass rate of 28.34 and 26.72 passes per hour, respectively.

3.3.18 Other survey months were noted to be relatively comparable in relation to total BAI, ranging between 19.16 to 21.00 passes per hour.

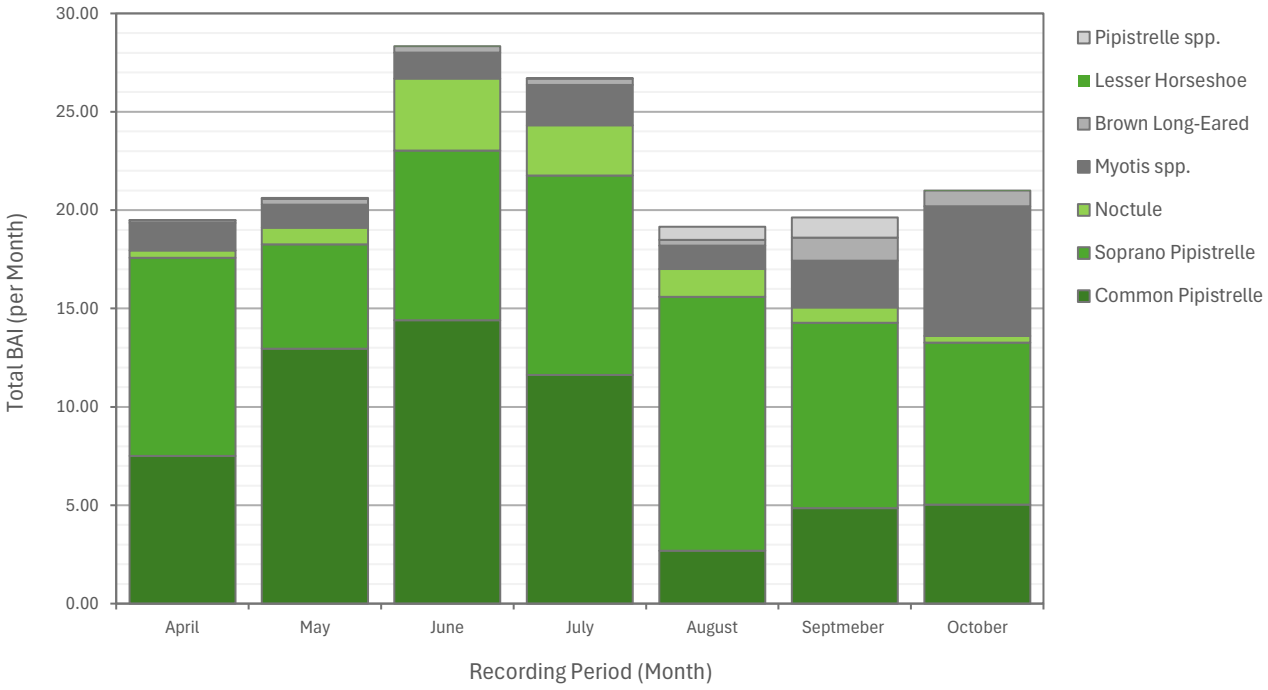
Frequency per Recording Period (Combined Assemblage)

3.3.19 Bat activity (when considered cumulatively for the bat assemblage) was recorded during each night sampled per month (**Table 3.8**).

Table 3.8: *Bat activity survey results per recording period for the combined species assemblage.*

Recording Period	No. Nights Sampled	No. Nights Bats Recorded	Percentage Nights Bats Recorded (%)	Total No. Passes	Percentage Distribution Passes (%)	Total Assemblage BAI (per Recording Period)
April	93	93	100.00	17,132	20.39	19.50
May	56	56	100.00	9,159	10.90	20.63
June	56	56	100.00	11,111	13.22	28.34
July	49	49	100.00	9,913	11.80	26.72
August	59	59	100.00	9,743	11.59	19.16
September	53	53	100.00	12,069	14.36	19.63
October	56	56	100.00	14,909	17.74	21.00
Total	422	422	100.00	84,036	100.00	21.44

[11] Note, April accounted for a higher number of nights sampled due to poor weather forecast, as such BAI should be interpreted as a more accurate measure of activity per recording period.



Graph 3.2: *Total BAI (passes per hour) per recording period for the overall survey effort.*

Species per Monitoring Station

3.3.20 **Table 3.9** summarises the total pass rate (BAI) per species at each MS location for the overall survey effort.

3.3.21 Five species were recorded across each individual MS location deployed on-Site, except for lesser horseshoe bat and unidentified *Pipistrellus* social calls, the former of which was undetected at MS1-MS2 and MS7-MS8, and the latter being absent from MS8.

3.3.22 A summary pass rates (pr species) for each monitoring station per recording period is provided in **Annex 3**.

Common pipistrelle

3.3.23 Common pipistrelle total BAI ranged between 0.56 to 32.70 passes per hour, being relatively higher at MS4 (32.70 passes per hour) and MS1 (16.57 passes per hour).

3.3.24 Activity was relatively variably between other MS locations but accounted for less than < 6 passes per hour. However, MS8 was notable for relatively low activity, accounting for < 1 pass per hour.

Soprano pipistrelle

3.3.25 Soprano pipistrelle total BAI ranged between 3.43 to 19.83 passes per hour, being relatively higher at MS1 (19.82 passes per hour) and MS3 (13.20 passes per hour).

3.3.26 BAI was relatively comparable between other MS locations, ranging between 5-10 passes per hour. However, activity was relatively lower at MS8 (3.43 passes per hour).

Pipistrellus spp.

3.3.27 Unidentified *Pipistrellus* total BAI was relatively comparable between MS locations where detected, accounting for < 1 pass per hour at each positive MS, apart from MS5 (1.18 passes per hour).

Noctule

3.3.28 Noctule total BAI ranged between 0.54 to 2.05 passes per hour, being relatively higher at MS2 (2.05 passes per hour) and MS3 (13.20 passes per hour).

3.3.29 Activity was comparable between other MS locations, although relatively higher between MS1, MS3 and M6 (each accounting for > 1 pass per hour), and lower at MS4, MS5, MS7 and MS8 (each accounting for < 1 pass per hour).

Myotis spp.

3.3.30 *Myotis* total BAI ranged between 0.86 to 6.67 passes per hour, being relatively higher at MS1 (6.67 passes per hour).

3.3.31 Activity was comparable between other MS locations, although relatively higher between MS2-MS5 (each accounting for > 1 pass per hour), and lower between MS6-MS8 (each accounting for < 1 pass per hour).

Brown long-eared

3.3.32 Brown long-eared total BAI was comparable between MS locations, each accounting for < 1 pass per hour, but was relatively higher at MS4 (0.75 passes per hour) and MS5 (0.79 passes per hour).

Lesser horseshoe

3.3.33 Lesser horseshoe total BAI (where activity was detected) was comparable between MS locations, with each positive MS accounting for ≤ 0.01 passes per hour.

Table 3.9: *A summary of total BAI per monitoring station (per species).*

Species / Genus	Monitoring Stations (Total BAI)							
	MS1	**MS2**	**MS3**	**MS4**	**MS5**	**MS6**	**MS7**	**MS8**
Common pipistrelle	16.57	4.27	2.28	32.70	5.52	1.89	1.54	0.56
Soprano pipistrelle	19.82	8.47	13.20	7.55	10.11	7.60	5.19	3.43
Pipistrellus spp.	0.01	0.04	0.77	0.02	1.18	0.10	0.01	N/A
Noctule	1.98	2.05	1.48	0.60	0.91	1.04	0.54	0.62
Myotis spp.	6.57	2.59	1.68	3.61	2.43	0.86	1.80	0.91
Brown long-eared	0.27	0.35	0.30	0.75	0.79	0.49	0.49	0.53
Lesser horseshoe	N/A	N/A	0.004	0.01	0.002	0.002	N/A	N/A

Species per Recording Period

3.3.34 **Table 3.10** presents the total pass rate (per species) recorded during each month of the survey effort (MS locations combined).

3.3.35 Most species were recorded on-Site consistently between months, except for lesser horseshoe bat and unidentified *Pipistrellus* social calls, the former of which was limited to April, June and October, and the latter going undetected during June and October.

3.3.36 A summary pass rates (pr species) for each monitoring station per recording period is provided in **Annex 3**.

Common pipistrelle

3.3.1 Common pipistrelle total BAI was variable between months, being relatively higher between May-July (> 10 passes per hour), and relatively lower during April and between September-October (~ 5 - 10 passes per hour), and lowest during August (< 5 passes per hour).

3.3.2 Specifically, peak BAI was recorded during June (14.40 passes per hour), whilst BAI was lowest during August (2.69 passes per hour).

Soprano pipistrelle

3.3.3 Soprano pipistrelle total BAI was variable between months, being relatively higher during April and between July-August (> 10 passes per hour), relatively lower during April and August-October (< 10 passes per hour), and lowest during May (< 5 passes per hour).

3.3.4 Specifically, peak BAI was recorded during August (12.91 passes per hour), whilst BAI was lowest during May (5.32 passes per hour).

Pipistrellus spp.

3.3.5 Unidentified *Pipistrellus total* BAI was relatively comparable between recording periods when detected, accounting for < 1 pass per hour per month, apart from September (1.03 passes per hour).

Noctule

3.3.6 Noctule total BAI showed some variability between recording periods, being relatively higher between June-August (> 1 pass per hour), relatively lower between April-May and September-October (< 1 passes per hour).

3.3.7 Specifically, peak BAI was recorded during June (3.66 passes per hour), whilst BAI was lowest during April (0.38 passes per hour).

Myotis spp.

3.3.8 *Myotis* species total BAI was variable between months, being relatively higher during October (> 5 passes per hour), relatively lower during July and September (≥ 2 passes per hour), and lowest during April-June and August May (< 2 passes per hour).

3.3.9 Specifically, peak BAI was recorded during October (3.66 passes per hour), whilst BAI was lowest during May and August (1.17 and 1.18 passes per hour, respectively).

Brown long-eared

3.3.10 Brown long-eared total BAI showed some variability between recording periods, being relatively higher during September (> 1 pass per hour), relatively lower between April-August and October (< 1 passes per hour).

3.3.11 Specifically, peak BAI was recorded during September (1.17 passes per hour), whilst BAI was lowest during April (0.12 passes per hour).

Lesser horseshoe

3.3.12 Lesser horseshoe total BAI was relatively comparable between recording periods when detected, accounting for < 1 pass per hour per month.

Table 3.10: *A summary of total BAI per recording period (per species).*

Species / Genus	Recording Period (Total BAI)						
	April	**May**	**June**	**July**	**August**	**September**	**October**
Common pipistrelle	7.51	12.95	14.40	11.62	2.69	4.86	5.04
Soprano pipistrelle	10.07	5.32	8.63	10.14	12.91	9.42	8.22
Pipistrellus spp.	0.02	0.04	0.00	0.02	0.67	1.03	0.00
Noctule	0.38	0.84	3.66	2.55	1.41	0.77	0.34
Myotis spp.	1.40	1.17	1.32	2.06	1.18	2.38	6.60
Brown long-eared	0.12	0.30	0.33	0.32	0.30	1.17	0.80
Lesser horseshoe	< 0.01	0.00	< 0.01	0.00	0.00	0.00	< 0.01

4 SUMMARY

Habitat Suitability Assessment

4.1.1 The Site includes continuous habitat types comprised of open, edge and closed niches, which provide both foraging, commuting and roosting opportunities relative to bats.

4.1.2 Whilst largely dominated by arable habitat types of limited value, given the distribution and quality of linear features and localised woodland parcels, and overall connectivity both on-Site and relative to the local landscape.

4.1.3 Consequently, the Site is of **Moderate** habitat suitability (in reference to current BCT guidance).

Night-time Bat Walkover Surveys

Species Assemblage

4.1.4 Over the combined NBW survey effort, a minimum of six species/genus of bat were recorded on-Site, including common pipistrelle, soprano pipistrelle, noctule, brown long-eared bat, an*d Myotis* species.

4.1.5 Spatially, most species were recorded per transect area over the combined survey effort, apart from brown long-eared bat being undetected at T4 (although presence was detected during automated activity surveys).

4.1.6 Seasonally, most species were recorded on-Site at a minimum of one transect area, apart from brown long-eared bat going undetected across transect areas during spring (although presence was detected during automated activity surveys).

4.1.7 However, species presence at each transect area per season showed variation, with only soprano pipistrelle call registrations recorded consistently (**Table 3.2**).

Species Distribution

4.1.8 Per transect area, bat activity was most frequently distributed in association with wooded linear features and woodland edge habitats, with limited activity recorded and/or observed in association with open pasture and croplands (**Figure 7-6**).

4.1.9 Per species, common and soprano pipistrelle were well-distributed across transect areas, whilst noctule, brown long-eared and *Myotis* bats were more localised when recorded, per transect (**Figure 7-6**).

4.1.10 Likewise, observed activity was limited to foraging and commuting activity, and was generally recorded in association with edge habitats, although some instances of open foraging were noted between transects.

Automatic Activity Surveys

Species Distribution

4.1.11 Over the combined survey effort, a minimum of seven species/genus of bat were recorded on-Site, including common pipistrelle, soprano pipistrelle, noctule, brown long-eared bat, lesser horseshoe bat and *Myotis* species.

4.1.12 When considering spatial distribution broadly, most species were recorded uniformly across each MS location over the combined survey effort, apart from horseshoe bat being limited to centrally distributed MS locations (i.e., MS3-MS6).

4.1.13 Likewise, when considering seasonal presence per MS location, most species were recorded on-Site during each monthly recording period (April-October), apart from horseshoe bat being limited to April, June and October recording periods (although presence per MS varied between recorded months).

Overall BAI Activity

4.1.14 Total BAI was variable between both MS locations and recording periods when considering combined bat activity (i.e., the assemblage) and individual species.

Overall BAI per Species

4.1.15 Total BAI for the combined assemblage for the overall Site equated for 21.44 passes per hour.

4.1.16 Soprano and common pipistrelle accounted for the highest pass rates relative to the overall Site area, equating to 9.33 and 7.72 passes per hour, respectively.

4.1.17 Per MS location, soprano pipistrelle accounted for the highest total BAI rate for most MS locations, apart from MS4 at which common pipistrelle accounted for the highest pass rate.

4.1.18 Per recording period, soprano pipistrelle accounted for the highest total BAI across most months (i.e., April, August-October), with common pipistrelle accounting for the highest pass rates during other recording periods (i.e., May-July).

Overall BAI per Monitoring Station

4.1.19 Per MS location, MS1 and MS4 accounted for the highest total pass rates for the combined assemblage at 45.21 and 45.24 passes per hour. Comparably, overall pass rates for the combined assemblage at other MS locations equated ≤ 20 passes per hour (MS5) or under, with MS8 accounting for lowest pass rate at 6.05 passes per hour.

4.1.20 Per species, peak activity was variable, with pass rates being greatest at MS1 relative to soprano pipistrelle and *Myotis* species, MS4 relative to common pipistrelle, MS5 relative to Pipistrellus calls and brown long-eared bat, and MS2 relative to noctule.

4.1.21 However, for some species peak BAI was not substantially greater than activity recorded at other MS locations (e.g., brown long-eared bat, lesser horseshoe and noctule).

Overall BAI per Recording Period

4.1.22 Per recording period, total pass rates for the combined assemblage were greatest during June and July recordings periods, with early to mid-summer representing peak activity. Total pass rates for the combined assemblage were relatively comparable between remaining months.

4.1.23 Per species, peak activity was variable, with pass rates being greatest during June relative to common pipistrelle and noctule, August relative to soprano pipistrelle, September relative to brown long-eared bat and *Pipistrellus* calls and October relative to *Myotis* species.

4.1.24 However, peak activity for lesser horseshoe bat was equal during both April and June, although overall peak BAI was not substantially greater than activity rates recorded during other months (i.e., October).

Annex 1

Scientific Names

Table A1.1 provides common and scientific names of bat species mentioned within this report.

Common Name	Scientific Name
Common pipistrelle	*Pipistrellus pipistrellus*
Soprano pipistrelle	*Pipistrellus pygmaeus*
Nathusius' pipistrelle	*Pipistrellus nathusii*
Noctule	*Nyctalus noctula*
Brown long-eared bat	*Plecotus auritus*
Whiskered bat	*Myotis mystacinus*
Natterer's bat	*Myotis nattererii*
Brandt's bat	*Myotis brandtii*
Daubenton's bat	*Myotis daubentonii*
Lesser horseshoe	*Rhinolophus hipposideros*
Greater horseshoe	*Rhinolophus ferrumequinum*

Annex 2

Weather Conditions

Table A2.1 below provides weather conditions during automatic activity surveys. Underlined text in **red** highlights sub-optimal weather conditions for bats, based on guidance outlined in Collins (2023).

Date	Temp at Dusk (°C)	Rainfall (mm)	Maximum Wind Speed (m/s)[12]
03/10/2023	10	0	2.78
04/10/2023	13	0	**5.83**
05/10/2023	14	0	4.72
06/10/2023	18	0	5.00
07/10/2023	14	0	1.11
08/10/2023	14	0	1.67
09/10/2023	15	0	2.22
18/04/2024	**9**	0.1	5.00
19/04/2024	**9**	0	3.33
20/04/2024	**8**	0	3.33
21/04/2024	10	0	3.33
22/04/2024	**9**	0	2.50
23/04/2024	**8**	0	4.17
24/04/2024	**7**	0	3.61
25/04/2024	**8**	0	3.33
26/04/2024	**9**	0	1.39
27/04/2024	**7**	0.1	2.22
28/04/2024	**9**	0	3.61
29/04/2024	**9**	0.2	3.89
16/05/2024	11	0.1	2.50
17/05/2024	12	0	1.67
18/05/2024	11	0	2.22
19/05/2024	12	0	0.56
20/05/2024	13	0	1.39
21/05/2024	11	0.7	1.39
22/05/2024	11	0	**5.28**
14/06/2024	**9**	0	3.06
15/06/2024	10	0	3.33
16/06/2024	12	0.4	4.17
17/06/2024	10	0	3.33

[12] Converted from km/h

Date	Temp at Dusk (°C)	Rainfall (mm)	Maximum Wind Speed (m/s)[12]
18/06/2024	10	0	2.78
19/06/2024	11	0	1.67
20/06/2024	12	0	1.67
12/07/2024	11	0	1.67
13/07/2024	12	0	1.67
14/07/2024	12	0	0.56
15/07/2024	13	0	1.39
16/07/2024	13	0	1.94
17/07/2024	15	0	0.28
18/07/2024	15	0	1.39
01/08/2024	14	0	1.94
02/08/2024	16	0	2.50
03/08/2024	11	0	2.50
04/08/2024	15	0	4.17
05/08/2024	19	0	**5.83**
06/08/2024	12	0	3.61
07/08/2024	13	0	2.78
08/08/2024	17	0	5.00
16/09/2024	11	0	0.83
17/09/2024	11	0	1.39
18/09/2024	12	0	1.11
19/09/2024	12	0	1.67
20/09/2024	12	0	2.78
21/09/2024	13	1	1.67
22/09/2024	15	0	2.22

Annex 3

Monitoring Stations per Recording Period (per Species)

Common pipistrelle

4.1.25 A BAI summary of common pipistrelle activity at each MS location per recording period is presented in **Table A3.1**.

4.1.26 Common pipistrelle activity was noted to have been recorded consistently at each MS location per recording period[13] However, common pipistrelle BAI per MS location showed variation between recording periods.

4.1.27 BAI was most frequently relatively higher at MS1 and MS4 (being highest at MS4 during May), and lowest at MS8 across recording periods (excluding August).

Table A3.1: *Common pipistrelle BAI (call registrations per hour) at each MS location, per recording period.*

MS ID	Recording Period per MS (BAI)						
	April	May	June	July	August	September	October
MS1	12.87	22.04	41.84	11.74	13.73	0.91	21.95
MS2	0.56	1.32	9.33	2.30	2.84	13.27	2.11
MS3	1.97	3.57	2.22	1.92	4.45	1.93	0.75
MS4	37.42	66.16	58.00	57.74	4.61	31.52	0.74
MS5	8.88	5.73	1.06	N/A	0.58	1.10	11.45
MS6	2.60	2.81	2.02	5.15	0.68	0.96	0.18
MS7	2.53	1.77	0.63	1.55	0.23	0.46	2.63
MS8	0.50	0.18	0.10	0.96	1.33	0.32	0.50

Soprano pipistrelle

4.1.28 A BAI summary of soprano pipistrelle activity at each MS location per recording period is presented in **Table A3.2.**

4.1.29 Soprano pipistrelle activity was also noted to have been recorded consistently at each MS location per recording period. However, soprano pipistrelle BAI per MS location showed variation between recording periods.

4.1.30 BAI was most frequently higher at MS1 (i.e., May, June and August) being highest during August, although peak activity was noted to be variable between other MS locations per recording period.

4.1.31 However, BAI was most frequently observed to be lowest at MS8 across recording periods (apart from June and July).

[13] Presence/absences at MS5 during the July recording period is unknown due to detector failure.

Table A3.2: *Soprano pipistrelle BAI (call registrations per hour) at each MS location, per recording period.*

MS ID	Recording Period per MS (BAI)						
	April	May	June	July	August	September	October
MS1	12.86	16.52	36.18	19.49	93.96	3.00	16.00
MS2	2.93	6.02	8.33	6.91	20.54	13.92	3.71
MS3	20.45	6.13	5.06	6.98	16.14	22.31	5.97
MS4	13.07	1.77	2.96	3.87	1.23	32.89	2.37
MS5*	14.15	2.83	3.16	N/A	6.71	3.51	22.02
MS6	6.59	6.20	8.14	9.36	11.35	5.03	7.85
MS7	10.54	2.40	1.73	2.49	3.26	3.69	6.48
MS8	0.70	0.72	3.49	21.89	1.19	1.17	1.37

Noctule

4.1.32 A BAI summary of noctule activity at each MS location per recording period is presented in **Table A3.3**.

4.1.33 Noctule was noted to have been recorded consistently at each MS location per recording period. BAI was broadly comparable but also showed variation between MS locations per recording period.

4.1.34 BAI was most frequently observed to be relatively higher at MS3 (i.e., April, May and October), although peak activity was noted to be variable between other MS locations per recording period (being highest at MS2 during June).

4.1.35 Noctule BAI was most frequently observed to be lowest at MS7 across recording periods (apart from August-October).

Table A3.3: *Noctule species BAI (call registrations per hour) at each MS location, per recording period..*

MS ID	Recording Period per MS (BAI)						
	April	May	June	July	August	September	October
MS1	0.41	0.67	11.22	3.43	2.00	0.54	0.14
MS2	0.19	0.97	12.14	2.87	1.99	0.60	0.38
MS3	0.96	2.81	2.90	2.43	1.03	1.22	0.52
MS4	0.26	0.47	0.53	2.28	0.28	0.37	0.41
MS5*	0.37	0.79	0.86	N/A	2.42	1.34	0.14
MS6	0.27	0.65	0.61	2.91	2.59	0.80	0.41
MS7	0.19	0.18	0.39	1.58	0.81	0.58	0.44
MS8	0.37	0.22	0.61	2.34	0.57	0.53	0.27

Myotis species

4.1.36 A BAI summary of *Myotis* activity at each MS location (per recording period) is presented in **Table A3.4**.

4.1.37 *Myotis* species were recorded consistently at each MS location per recording period. BAI was broadly comparable, but also showed variation between MS locations per recording period.

4.1.38 BAI was most frequently observed to be relatively higher at MS4 (i.e., April-August), apart from MS2 during September, and MS1 during October (the latter being notable for peak BAI).

4.1.39 Lowest BAI was also variable between MS locations (per recording period), but was most frequently observed at MS8 (i.e., May-June, and October).

Table A3.4: *Myotis species BAI (call registrations per hour) at each MS location, per recording period.*

MS ID	Recording Period per MS (BAI)						
	April	May	June	July	August	September	October
MS1	0.34	1.59	1.16	1.00	0.67	1.51	30.25
MS2	0.34	0.74	0.51	1.11	1.84	4.89	7.11
MS3	1.62	1.35	2.63	1.98	1.07	2.41	1.05
MS4	6.95	3.17	4.12	3.83	2.03	3.74	1.42
MS5*	1.39	1.15	1.04	N/A	1.61	2.02	6.33
MS6	0.42	0.52	0.24	2.13	1.20	0.95	0.87
MS7	0.75	0.83	0.71	1.30	0.22	2.60	5.13
MS8	0.71	0.04	0.16	3.09	0.45	1.51	0.65

Brown long-eared bat

4.1.1 A BAI summary of brown long-eared activity at each MS location (per recording period) is presented in **Table A3.5**.

4.1.2 Brown long-eared was recorded consistently at each MS location per recording period. BAI was relatively comparable. mostly accounting for < 1 pass per hour between MS locations per recording period but showed some variation.

4.1.3 BAI was most frequently observed to be relatively higher at MS4 (i.e., May-June, October) and MS5 (April, September-October), apart from MS2 during July, and MS6 during August. Peak BAI (per recording period) was recorded at MS5 during September.

4.1.4 Lowest BAI was also notably variable between MS locations (per recording period), but was most frequently recorded at MS1 (i.e., April, October).

Table A3.5: *Brown long-eared BAI (call registrations per hour) at each MS location, per recording period.*

MS ID	Recording Period per MS (BAI)						
	April	May	June	July	August	September	October
MS1	0.03	0.34	0.14	0.32	0.08	0.65	0.28
MS2	0.19	0.27	0.20	0.53	0.65	0.32	0.36
MS3	0.12	0.14	0.22	0.09	0.04	0.76	0.54
MS4	0.08	0.79	1.04	0.43	0.09	2.00	1.26
MS5*	0.19	0.25	0.12	N/A	0.42	2.18	1.26
MS6	0.08	0.07	0.47	0.43	0.91	0.71	0.79
MS7	0.11	0.34	0.27	0.19	0.03	1.40	0.90
MS8	0.12	0.18	0.14	0.25	0.04	1.67	0.98

Lesser horseshoe

4.1.5 A BAI summary of lesser horseshoe activity at each MS location (per recording period) is presented in **Table A3.6.**

4.1.6 At MS locations where detected, lesser horseshoe was not recorded consistently per recording period.

4.1.7 BAI was relatively comparable, accounting for < 0.01 pass per hour between MS locations (MS3-MS5) during April, MS3 during June, and MS4 and MS6 during October.

Table A3.6: *Lesser horseshoe BAI (call registrations per hour) at each MS location, per recording period.*

MS ID	Recording Period per MS (BAI)						
	April	May	June	July	August	September	October
MS1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS3	0.01	0.00	0.02	0.00	0.00	0.00	0.00
MS4	0.02	0.00	0.00	0.00	0.00	0.00	0.02
MS5*	0.01	0.00	0.00	N/A	0.00	0.00	0.00
MS6	0.00	0.00	0.00	0.00	0.00	0.00	0.01
MS7	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS8	0.00	0.00	0.00	0.00	0.00	0.00	0.00