



MacArthur  
Green

# Torfichen Wind Farm Bat Survey Report

## Appendix 8.3

---

**Date:** 19 September 2023  
**Tel:** 0141 342 5404  
**Web:** [www.macarthurgreen.com](http://www.macarthurgreen.com)  
**Address:** 93 South Woodside Road | Glasgow | G20 6NT

---

## Document Quality Record

Version	Status	Person Responsible	Date
0.1	Draft	F. Gillies	31/07/2023
0.2	Reviewed	D. MacArthur / G. Chamberlain	02/08/2023
0.3	Updated	F. Gillies	02/08/2023
0.4	Reviewed	G. Chamberlain / N. White	10/08/2023
0.5	Updated	F. Gillies	17/08/2023
0.6	Reviewed	G. Chamberlain / N. White	25/08/2023
0.7	Updated	F. Gillies / K. Hobbs	11/09/2023
1.0	Internal Approval	K. Hobbs / B. Henry	19/09/2023

MacArthur Green is helping combat the climate crisis by operating a biodiversity positive, carbon conscious business. Read more at [www.macarthurgreen.com](http://www.macarthurgreen.com)



## CONTENTS

1	INTRODUCTION .....	1
2	THE PROPOSED DEVELOPMENT AND SURVEY AREA.....	1
3	BATS AND WIND FARMS .....	2
3.1	Policy and Guidance .....	2
4	METHODS.....	2
4.1	Desk-Based Assessment .....	2
4.2	Field Survey Methods .....	3
4.3	Methods for Analysing Bat Activity Levels and Risks .....	5
5	BAT SURVEY LIMITATIONS.....	8
6	SURVEY RESULTS & ANALYSIS .....	9
6.1	Desk-Based Assessment .....	9
6.2	Preliminary Bat Roost Assessment .....	10
6.3	Automated Activity Surveys .....	10
7	REFERENCES .....	16
ANNEX A.	BATS LEGAL STATUS.....	17
ANNEX B.	SURVEY TIMINGS & ANABAT LOCATIONS .....	19
ANNEX C.	INITIAL SITE RISK ASSESSMENT .....	21
ANNEX D.	PRELIMINARY BAT ROOST ASSESSMENT .....	22
ANNEX E.	SEASONAL LOCATION SPECIFIC DATA .....	24

## LIST OF TABLES

Table 4-1: Vulnerability of Bat Species to Turbine Impact in the UK .....	6
Table 4-2: Population Relative Abundance of Bats in Scotland.....	6
Table 4-3: Level of Potential Vulnerability of Populations of British Bat Species.....	7
Table 4-4: Initial Site Risk Level (1-5) Assessment .....	7
Table 4-5: Overall Risk Assessment.....	8
Table 6-1 Data Providers for NBN Atlas Scotland Records Used.....	9
Table 6-2 Total Number of Bat Passes for Each Species Across all Locations .....	11
Table 6-3 Site A: Bat Activity Index of Entire Site.....	11
Table 6-4 Site C: Bat Activity Index of Entire Site.....	12
Table 6-5: Common Pipistrelle Average Annual Site Activity Levels – Bat Passes Per Hour.....	13
Table 6-6 Soprano Pipistrelle Average Annual Site Activity Levels – Bat Passes Per Hour.....	13
Table 6-7 Pipistrelle species Average Annual Site Activity Levels – Bat Passes Per Hour .....	13
Table 6-8 <i>Nyctalus</i> Species Average Annual Site Activity Levels – Bat Passes Per Hour .....	13
Table 6-9: Collision Risk, Population Relative Abundance and Potential Vulnerability.....	14
Table 6-10: Risk Assessment Scores Based on average comparison Reference Site for High Collision Risk Species .....	15
Table A-1 Legal and Conservation Status of all UK Bats.....	18
Table B-1 Description of Anabat Locations and Summary of Temporal Survey Effort.....	19
Table C-1 Initial Site Risk Assessment.....	21
Table D-1 Preliminary Bat Roost Assessment Target Notes .....	22

## LIST OF FIGURES

Figure 8.6	Bat Survey Area, Anabat Locations & Preliminary Bat Roost Assessment Results
Figure 8.7	Average Seasonal Bat Site Activity 2022 – Common pipistrelle
Figure 8.8	Average Seasonal Bat Site Activity 2022 – Soprano pipistrelle
Figure 8.9	Average Seasonal Bat Site Activity 2022 – Nathusius’ pipistrelle
Figure 8.10	Average Seasonal Bat Site Activity 2022 – <i>Nyctalus</i> spp.

## 1 INTRODUCTION

MacArthur Green was commissioned by Renewable Energy Systems Ltd. (the ‘Applicant’) to carry out bat surveys at the proposed Torfichen Wind Farm located near Gorebridge, Midlothian, (hereafter referred to as the ‘Proposed Development’).

Bat surveys included:

- Desk-based assessment;
- A Preliminary Roost Assessment for Bat (PRA); and
- Automated activity surveys.

The aim of the surveys was to quantify the Proposed Development usage by bats and variation in bat activity levels within the site, and to inform the ecological impact assessment for the Torfichen Wind Farm Environmental Impact Assessment (EIA) Report.

## 2 THE PROPOSED DEVELOPMENT AND SURVEY AREA

The Proposed Development is located approximately 4 km south of Gorebridge and 9.5 km south-east of Penicuik, within the northern edge of the Moorfoot Hills in the Midlothian Council (MC) area.

The site is set within a mixed landscape of undulating farmland, fragmented moorland and forestry which is populated sparsely with settlements. The elevation on-site varies from 270 m Above Ordnance Datum (AOD) along the northern boundary of the site to 490 m AOD near the summit of Mauldslie Hill to the south. Elevation generally decreases towards the north-west. A number of tributaries to the Black Burn, Latch Burn and Middleton North Burn intersect the site. The site is primarily agricultural, predominately used for livestock farming.

As described in **Chapter 3: Project Description**, the Proposed Development will comprise 18 stand-alone, three bladed horizontal axis wind turbines up to 180 m blade tip height. The associated infrastructure will include site access, access tracks, crane hardstandings, underground cabling, on-site substation and maintenance building, energy storage facility, temporary construction compounds, laydown area and potential excavations/borrow workings.

The Proposed Development does not overlap with any statutory designated sites containing bat related qualifying features and interests.

The temporal (Anabat) survey area covered the main turbine infrastructure area and consisted of 13 Anabat deployment locations as shown in **Figure 8.6**.

The PRA survey area covered during the baseline PRA survey for the Proposed Development greatly exceeds the extent of the site boundary and is shown in **Figure 8.6**.

## 3 BATS AND WIND FARMS

### 3.1 Policy and Guidance

All bat species are protected under the following legislation:

- The Habitats Directive 92/43/EEC (as amended);
- The Wildlife and Countryside Act 1981 (as amended); and
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

Details pertaining to the legal status of bats are included within **Annex A** and in **Table A-1**.

In the UK and Europe, guidelines have been produced with regards to assessing the ecological impact upon bats from wind farm developments. These guidelines help to inform survey and mitigation strategies.

The following guidance documents have been used in the preparation of this report:

- Collins, J. (ed) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 3<sup>rd</sup> Edition. The Bat Conservation Trust, London<sup>1</sup>;
- Andrews, H. (2018) *Bat Roosts in Trees: a guide for identification and assessment for tree-care and ecology professionals*. Pelagic Publishing, Exeter;
- Reason, P.F. and Wray, S. (2023). *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats*. Chartered Institute of Ecology and Environmental Management, Ampfield;
- Russ, J. (2012) *British Bat Calls, A Guide to Species Identification*, Pelagic Publishing, Exeter; and
- NatureScot, Natural England, Natural Resources Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & the Bat Conservation Trust (BCT). (August 2021). *Bats and Onshore Wind Turbines: Survey Assessment and Mitigation*.

## 4 METHODS

### 4.1 Desk-Based Assessment

A desk-based assessment was undertaken with regards to the presence of bat species within the site and its environs.

A National Biodiversity Network (NBN)<sup>2</sup> Atlas Scotland search was completed to obtain bat records from 2008 to 2023 within 10 km of the Proposed Development.

---

<sup>1</sup> Methods and analysis followed the 3<sup>rd</sup> edition of the Bat Conservation Trust survey guidelines as surveys were completed before the 4<sup>th</sup> edition guidelines were published in September 2023.

<sup>2</sup> NBN Atlas occurrence download at <https://nbnatlas.org> accessed on Fri Jul 14 08:07:02 UTC 2023.

## 4.2 Field Survey Methods

### 4.2.1 Preliminary Bat Roost Assessment

The PRA followed the assessment methodology as set out in Collins (2016), to identify any Potential Roost Features (PRFs) in trees, buildings and structures, which could support roosting bats and to search for evidence of roosting bats. Where PRFs were identified, they were assigned a value of low, moderate or high suitability which indicates the likelihood of bats being present and informs the requirement for further survey work, such as a climbing inspection and/or dusk and dawn bat activity surveys. Collins (2016), state the following descriptions for assessing PRFs:

- Negligible – Negligible habitat features on site to be used by roosting bats.
- Low – A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions<sup>3</sup> and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity or hibernation<sup>4</sup>).

A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential<sup>5</sup>.

- Moderate – A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions<sup>3</sup> and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
- High – A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions<sup>3</sup> and surrounding habitat.

The PRA was carried out within the survey area, as shown in **Figure 8.6**.

### 4.2.2 Automated Activity Surveys

NatureScot *et al.* (2021) recommends that, “Where developments have more than ten turbines, detectors should be placed within the developable area at ten potential turbine locations plus a third of additional potential turbine sites up to a maximum of 40 detectors for the largest developments.”

The Proposed Development layout at the time of survey in 2022 included 19 proposed turbines. A 19-turbine site would therefore require 13 locations to be sampled. Detectors were placed at

---

<sup>3</sup> For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

<sup>4</sup> Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.

<sup>5</sup> This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

potential turbine locations across the site, deployed seasonally (three deployment periods) from May to September, with an additional deployment in October due to detector issues throughout the seasons. NatureScot *et al.* (2021) also recommends a minimum of ten consecutive nights of sampling per seasonal deployment. Detector locations are shown in **Figure 8.6**.

Anabat Chorus, Swift and Express detectors recording full spectrum and zero-crossing files were deployed for a minimum period of 14 consecutive nights across the site (i.e., exceeding minimum survey requirements of ten days per season; spring April - May, summer June - mid-August; autumn mid-August - October) and were positioned at a height of 1 m or 2 m above ground level. Each detector recorded bats from dusk to dawn with detectors starting 30 minutes before dusk and finishing 30 minutes after dawn. Detector operating times and a description of the habitat type at each location is shown in **Table B-1 of Annex B**.

Following the publication of guidance (NatureScot *et al.* 2019, updated 2021) stating that “*full spectrum automatic detectors should be deployed, as a minimum*”. NatureScot<sup>6</sup> were consulted (21st March 2019) and advised that the use of zero-crossing detectors would be permitted with a transition period towards full spectrum detectors. NatureScot recommended deploying a few full-spectrum detectors alongside zero-crossing detectors at a subset of locations, so that detectability could be calibrated. This was incorporated into the survey method for the Proposed Development. At Location 10X and Location 13X (during visit 3), an Anabat Express detector recording zero-crossing files was deployed alongside an Anabat Chorus detector which was set to full spectrum. The Express detector was deployed with a sensitivity value of 8 (High). The full spectrum detector was deployed with the following settings:

- Sensitivity value of 14;
- Minimum frequency of 15 kHz;
- Maximum frequency of 250 kHz;
- Maximum file length of 15 s;
- Minimum event of -2 ms; and
- Sampling rate of 320 kHz.

Data was analysed using Kaleidoscope Pro Auto ID classifier which assigns a species label to a sound file (Reason *et al.* 2016). To ensure that all bat calls (with the exception of common and soprano pipistrelle which were excluded) were identified correctly by the software, they were manually reviewed by an appropriately trained ecologist using Kaleidoscope Viewer and AnalookW software. This method of analysis is in line with current guidelines for data analysis which recommends the manual checking of all non-*Pipistrellus* calls (excluding *Nathusius'* pipistrelle) when using automated methods (Collins, 2016). Sound files labelled as noise were also reviewed. Guidance on call parameters was taken from Russ (2012).

At the time of preparing this report (July/August 2023), the secure online tool Ecobat (Mammal Society, 2017) was not available. Analysis of bat data followed recommendations within

---

<sup>6</sup> Formerly Scottish National Heritage (SNH).



NatureScot *et al.* (2021) to use a measure of relative bat activity at the Proposed Development<sup>7</sup>. Reference sites were used as a comparison for bat activity level at the site. The data was then evaluated in accordance with NatureScot *et al.* (2021) guidance to determine the overall site risk level.

#### 4.3 Methods for Analysing Bat Activity Levels and Risks

NatureScot *et al.* (2021) details the methodology for analysing bat activity levels. This method is summarised below and involves the following steps:

1. Estimating bat activity levels;
2. Categorising collision risk of the relevant species;
3. Identifying population relevant abundance (size of the populations);
4. Categorising the potential vulnerability of bat populations by combining collision risk with population abundance;
5. Categorising the site risk level;
6. Completing the overall risk assessment; and
7. An assessment of significance and mitigation.

The following sections outline the methods used in each step.

##### 4.3.1 Step 1: Bat Activity Levels

To understand behaviour of species at the site, and how bat activity levels vary across the site both spatially and throughout the seasons, bat passes per hour for each species, location and season were ranked by percentile and assigned an activity category corresponding to the following percentile scores:

- 0 to 20 – Low
- 21 to 40 – Low to Moderate
- 41 to 60 – Moderate
- 61 to 80 – Moderate to High
- 81 to 100 - High

A measure of relative bat activity compared to other sites in similar areas at the same time of year could not be obtained using Ecobat due to the tool not being available at the time of reporting. The approach for estimating relative bat activity levels in relation to other sites therefore uses bat passes per hour to provide the relative bat activity from comparing four reference sites within 20 km of the Proposed Development (detailed in Section 6.3.1). Bat activity levels in relation to reference sites have been categorised as High, Moderate or Low.

---

<sup>7</sup> Section 6.1 of NatureScot 2021 states, “Assessments of bat activity that do not use the online repository must detail how the inferred level of relative bat activity has been derived.” Available online: <https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation>.

#### 4.3.2 Step 2: Vulnerability to Collision

Appendix 3 of NatureScot et al. (2021) presents a generic assessment of vulnerability to collision for UK species, based on species behaviour, flight characteristics and casualties in the UK and Europe. **Table 4-1** provides a summary of the vulnerability of each bat species to collision.

**Table 4-1: Vulnerability of Bat Species to Turbine Impact in the UK**

Risk of Turbine Impact (Collision Risk)		
Low Risk	Medium Risk	High Risk
Myotis spp.	Serotine	Common pipistrelle
Long-eared bats	Barbastelle	Soprano pipistrelle
Horseshoe bats		Noctule
		Leisler's bat
		Nathusius' pipistrelle

Habitat characteristics at the location of turbines can have an important influence on the vulnerability of bat species to collision. For example, proximity to key feeding sites and commuting routes such as water features and woodland edge habitats is known to increase the likelihood of bat collision (NatureScot et al. 2021).

#### 4.3.3 Step 3: Population Relative Abundance

NatureScot et al. (2021) details the sensitivity of a bat species to impact based on their population's relative abundance in Scotland as detailed in **Table 4-2**. Species with the rarest relative abundance are more susceptible to significant effects.

**Table 4-2: Population Relative Abundance of Bats in Scotland**

Relative Abundance	Species
Common	Common pipistrelle ( <i>Pipistrellus pipistrellus</i> )
	Soprano pipistrelle ( <i>Pipistrellus pygmaeus</i> )
Rarer	Brown long-eared bat ( <i>Plecotus auritus</i> )
	Daubenton's bat ( <i>Myotis daubentonii</i> )
	Natterer's bat ( <i>Myotis nattereri</i> )
Rarest	Whiskered bat ( <i>Myotis mystacinus</i> )
	Brandt's bat ( <i>Myotis brandtii</i> )
	Nathusius' pipistrelle ( <i>Pipistrellus nathusii</i> )
	Noctule bat ( <i>Nyctalus noctule</i> )
	Leisler's bat ( <i>Nyctalus leisleri</i> )

#### 4.3.4 Step 4: Potential Vulnerability of Bat Populations

**Table 4-3** below, sourced from NatureScot et al. (2021), uses the measure of collision risk, in combination with population relative abundance, to indicate the potential vulnerability of

populations of British bat species. The overall potential vulnerability of bat populations is identified as: low (yellow), medium (orange), high (red).

**Table 4-3: Level of Potential Vulnerability of Populations of British Bat Species**

Relative Abundance of Bats in Scotland	Collision Risk		
	Low collision risk	Medium collision risk	High collision risk
Common species			Common pipistrelle Soprano pipistrelle
Rarer species	Brown long-eared bat Daubenton’s bat Natterer’s bat		
Rarest species	Whiskered bat Brandt’s bat		Nathusius’ pipistrelle Noctule bat Leisler’s bat

**4.3.5 Step 5: Categorise the Site Risk Level**

The site risk level is categorised through a combination of habitat risk and project size which is then entered into the table matrix as shown below in

**Table 4-4** to calculate the overall site risk level. The full matrix table, as provided within NatureScot *et al.* (2021), is shown in **Annex C** of this report which includes descriptions on how to determine the habitat risk and project size for the Proposed Development.

**Table 4-4: Initial Site Risk Level (1-5) Assessment**

Habitat Risk		Project Size		
		Small	Medium	Large
Low		1	2	3
Moderate		2	3	4
High		3	4	5

Key: Green (1-2) – low/lowest site risk; Amber (3) – medium site risk; Red (4-5) – high/highest site risk \*

\* Some sites could conceivably be assessed as being of no (0) risk to bats. This assessment is only likely to be valid in more extreme environments, such as above the known altitudinal range of bats, or outside the known geographical distribution of any resident British species.

**4.3.6 Step 6: Risk Assessment**

The overall risk assessment is undertaken for high collision risk species identified onsite and involves combining site risk level (Section 4.3.5,

**Table 4-4**) with the reference site activity category (Section 4.3.1). The overall risk assessment matrix is shown in **Table 4-5** below where ‘Low’ site risk level (green) is 0-4, ‘Medium’ site risk level (amber) is 5-12, and ‘High’ site risk level (red) is 15-25.

**Table 4-5: Overall Risk Assessment**

		Reference Sites bat activity category					
		Nil (0)	Low (1)	Low-Moderate (2)	Moderate (3)	Moderate-High (4)	High (5)
Site Risk Level	Lowest (1)	0	1	2	3	4	5
	Low (2)	0	2	4	6	8	10
	Medium (3)	0	3	6	9	12	15
	High (4)	0	4	8	12	15	18
	Highest (5)	0	5	10	15	20	25

**4.3.7 Step 7: Assessment of Significance and Mitigation**

The outputs of the risk assessment detailed in step 6 above are then used to assess the significance of effect within the Ecological Impact Assessment. At this stage, other site-specific factors should be considered such as habitat characteristics (and how they may change), behaviour of species at the Proposed Development, and location of the Proposed Development regarding the natural range of the species and how this could affect favourable conservation status.

Mitigation measures as detailed within section 7.1 of NatureScot *et al.* (2021) are then considered where appropriate.

**5 BAT SURVEY LIMITATIONS**

The guidance recommends the minimum level of pre-application survey required for ground level static detectors to be ten nights of recordings in each of spring (April - May), summer (June to mid-August) and autumn (mid-August - October). In Scotland, due to unfavourable weather conditions and low activity levels for bats in April, ground-level automated activity surveys commenced in May and were completed in September by Direct Ecology, with recordings at six additional locations completed in October by MacArthur Green.

Automated activity surveys should capture a sufficient number of nights (minimum of ten nights) with appropriate weather conditions for bat activity (i.e., temperatures at or above of 8°C in Scotland at dusk, maximum ground level wind speed of 5 m/s and no, or only very light, rainfall) (NatureScot *et al.*, 2021). To account for the potential limitations of weather on the number of suitable nights recorded, surveys were carried out over longer deployment periods, with a minimum of 14 nights recorded.

Due to unexpected technical issues with the detectors, microphones, or batteries, it was not always possible to achieve 14 consecutive nights of recordings. Eight detectors failed to record data for the minimum ten nights during a deployment period (Location 5 in June, Locations 12, 13, 18 and 19 in July and Locations 1, 4 and 12 in September), with these locations recording a range of zero to eight nights. Location 13 in October recorded only eight nights of data in the extra deployment period. At Location 1, the detector had fallen during the deployment period, but it had recorded for the full 14 nights. As the majority of locations recorded for more than 10 nights,

with a total of 477 complete nights recorded (555 including the extra deployment period in October) which is beyond the minimum number of nights (13 Anabats\*10 nights\*3 seasonal deployments = 390 nights of data) required for a development of this size, the small loss of data is considered to not have affected the overall assessment of risk. The survey timings can be seen in **Annex B, Table B-1**.

Anabat detectors are a commonly used bat detector for acoustic monitoring at wind farm sites, however all bat detectors have limitations and will only monitor bat activity within a limited area, which for Anabats is usually around 30 m, depending on a variety of environmental factors. Furthermore, due to passive monitoring methodologies depending on sound reaching the microphone, the detection rate of bat calls varies with a bias towards loud bat calls with quieter calls, namely brown long-eared bats (low collision risk species), potentially being under-recorded.

## 6 SURVEY RESULTS & ANALYSIS

### 6.1 Desk-Based Assessment

The NBN Atlas data search<sup>2</sup> returned records of the following bat species within 10 km of the Proposed Development between 2008-2023 inclusive:

- Daubenton's;
- Natterer's;
- *Myotis* spp.;
- Noctule;
- Nathusius' pipistrelle;
- Common pipistrelle;
- *Pipistrelle* spp.;
- Soprano pipistrelle; and
- Brown long-eared bat.

Details regarding licences and data providers for these records are included in **Table 6-1** below.

**Table 6-1 Data Providers for NBN Atlas Scotland Records Used**

Species	Data Provider	Licence <sup>8</sup>
Daubenton's	Bat Conservation Trust (BCT). Scottish Natural Heritage (SNH)/British Trust for Ornithology (BTO) (Southern Scotland Bat Survey)	OGL
Natterer's	Bat Conservation Trust (BCT). Scottish Natural Heritage (SNH)/British Trust for Ornithology (BTO) (Southern Scotland Bat Survey)	OGL

<sup>8</sup> Open Government Licence (OGL) <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/> [Accessed December 2022].

Species	Data Provider	Licence <sup>8</sup>
Myotis spp.	Bat Conservation Trust (BCT). Scottish Natural Heritage (SNH)/British Trust for Ornithology (BTO) (Southern Scotland Bat Survey)	OGL
Noctule	Scottish Natural Heritage (SNH)/British Trust for Ornithology (BTO) (Southern Scotland Bat Survey)	OGL
Nathusius' pipistrelle	Scottish Natural Heritage (SNH)/British Trust for Ornithology (BTO) (Southern Scotland Bat Survey)	OGL
Common pipistrelle	Bat Conservation Trust (BCT). BCT & Biological Records Centre (Marley, Amy). Scottish Natural Heritage (SNH)/British Trust for Ornithology (BTO) (Southern Scotland Bat Survey)	OGL
Pipistrelle spp.	Bat Conservation Trust (BCT). NatureScot (Peter Leach, Dougie McKenna). Scottish Natural Heritage (SNH)/British Trust for Ornithology (BTO) (Southern Scotland Bat Survey)	OGL
Soprano pipistrelle	Bat Conservation Trust (BCT). NatureScot (Peter Leach, Dougie McKenna, Rebecca Brassey, Brian Boag, David Wild). Scottish Natural Heritage (SNH)/British Trust for Ornithology (BTO) (Southern Scotland Bat Survey)	OGL
Brown long-eared bat	Bat Conservation Trust (BCT). Scottish Natural Heritage (SNH)/British Trust for Ornithology (BTO) (Southern Scotland Bat Survey)	OGL

## 6.2 Preliminary Bat Roost Assessment

The PRA survey for the Proposed Development was undertaken by MacArthur Green in October and November 2022. Associated PRF records are shown in **Figure 8.6** with the detailed results (target notes) listed in **Table D-1, Annex D**.

In summary, there were 36 features recorded which contained potential suitability for roosting bats: 32 trees and four structures. Potential roosting suitability were classified as follows; 12 negligible, nine low, 14 moderate and one high (shown in **Figure 8.6**).

No features with moderate or high suitability for roosting bats were recorded within 200 m plus rotor radius of a proposed turbine location and as such no further surveys were required. The closest feature recorded, with moderate suitability, was over 535 m from turbine 1. The closest feature recorded, with high suitability, was 970 m from turbine 15.

## 6.3 Automated Activity Surveys

Direct Ecology deployed detectors at 13 locations at the site from May to September in 2022 over a total period of 48 days and collecting 477 complete recording nights of data, see **Table B-1 of Annex B** and **Figure 8.6**. MacArthur Green deployed detectors at six locations within the site during October 2022 over a total period of 14 days and collecting 78 complete recording nights of data, see **Table B-1 of Annex B** and **Figure 8.6**.

A total of six bat species and one bat genus were recorded at these locations. The total number of passes recorded for each species across all the detectors within the site and average (mean) Bat Passes Per Hour are shown below in **Table 6-2**.

**Table 6-2 Total Number of Bat Passes for Each Species Across all Locations**

Species/Species Group	No of Registrations	Percentage of total (%)	Mean Bat Passes Per Hour*
Soprano pipistrelle	1451	49.04	0.25
Common pipistrelle	1259	42.55	0.23
Daubenton's	129	4.36	0.03
Brown long-eared	53	1.79	0.01
Nyctalus spp.	36	1.21	0.01
Nathusius' pipistrelle	27	0.91	0.00
Natterer's	4	0.14	0.01
<b>Total</b>	<b>2959</b>	<b>100</b>	<b>0.54</b>

\*The number of hours the detectors recorded for each visit was based on an assumed time. Visit 1 recorded 8 hours per night, visit 2 recorded 9 hours per night, visit 3 recorded 12 hours per night and visit 4 recorded 14.5 hours per night. Any failed recordings were not included in the calculations.

The survey results were processed using the reference sites as a comparison to gain a measure of relative bat activity (bat passes per hour) at the Proposed Development. The summarised results and analysis are presented in Steps 1 – 6 below.

### 6.3.1 Step 1: Bat Activity Levels

#### Bat Activity Levels Across the Site and Through the Seasons

Data on the activity levels for all species across the site and through the seasons is provided in **Table E-1 of Annex E**.

#### Average Annual Site Activity Levels (Bat Activity Index)

A summary of the four reference sites is provided below. All four site's assessments concluded that the majority of the High-Risk species had Low risk.

Site A<sup>9</sup> was surveyed in 2013 and categorised bat activity level as Low. The assessment was for an extension of ten proposed turbines. The habitat was mainly grassland, some heathland and patches of conifer plantation. **Table 6-3** presents the total number of bat passes at all locations across the site.

**Table 6-3 Site A: Bat Activity Index of Entire Site**

Species/Genus	Mean Bat Passes Per Hour
Common pipistrelle	2.25

<sup>9</sup> Longpark Wind Farm Extension Environmental Statement (April 2014).

Species/Genus	Mean Bat Passes Per Hour
Soprano pipistrelle	2.12
Noctule	0.02
<i>Myotis</i> spp.	0.01
<i>Pipistrelle</i> spp.	0.02
Unidentified	0.01

Site B<sup>10</sup> was surveyed in 2014 and categorised bat activity level as Low. The assessment was for an extension of six proposed turbines. The habitat was mainly grassland and plantation, with a few burns dissecting the site. Site B recorded common and soprano pipistrelle with the mean bat passes per hour for *Pipistrelle* spp., as 11.24.

Site C<sup>11</sup> was surveyed in 2020 and categorised the high risk *Nyctalus* species as Low and the *Pipistrelle* species as Moderate to High. The assessment was for an extension of 12 proposed turbines. The habitat mainly comprised of conifer plantation, with a few burns dissecting the site. **Table 6-4** indicates the total number of bat passes at all locations across the site.

**Table 6-4 Site C: Bat Activity Index of Entire Site**

	Mean Bat Passes Per Hour
Common pipistrelle	0.20
Soprano pipistrelle	0.15
<i>Nyctalus</i> spp.	0.01
<i>Myotis</i> spp.	0.00
<i>Pipistrelle</i> sp.	0.00
Brown long-eared	0.00

Site D<sup>12</sup> was surveyed in 2017 and categorised the bat activity as Low. The assessment was for eight proposed turbines. The habitat mainly comprised of open ground of moorland and grassland, with strips of conifer plantation and minor watercourses dissecting the site. A total of 951 bat passes were recorded (common pipistrelle, soprano pipistrelle, *Nyctalus* spp. and *Myotis* spp.).

**Table 6-5, Table 6-6, Table 6-7 and Table 6-8** detail the average annual site activity levels for High-risk species, calculated using the reference sites.

<sup>10</sup> Bat Survey for Pogbie Windfarm, Midlothian (October 2014).

<sup>11</sup> Cloich Forest Wind Farm, Volume 3: Technical Appendices, Technical Appendix A7.3: Bat Surveys (March 2021).

<sup>12</sup> Wull Muir Wind Farm, Supplementary Environmental Information, Technical Appendix 4-2: Bat Activity Survey and Roost Assessment (September 2019).



**Table 6-5: Common Pipistrelle Average Annual Site Activity Levels – Bat Passes Per Hour**

Species		Site A	Site B	Site C	Site D
Common pipistrelle	Bat passes per hour	2.25	-	0.20	-
	Sensitivity*	Low	-	Moderate to High	Low
Proposed Development	Bat passes per hour	(0.23) ranked 2 <sup>nd</sup> relative to other reference sites			
	Sensitivity	Low to Moderate (2-6)			

\*as reported by project's Technical Appendix/Environmental Statement.

**Table 6-6 Soprano Pipistrelle Average Annual Site Activity Levels – Bat Passes Per Hour**

Species		Site A	Site B	Site C	Site D
Soprano pipistrelle	Bat passes per hour	2.12	-	0.15	-
	Sensitivity*	Low	-	Moderate to High	Low
Proposed Development	Bat passes per hour	(0.25) ranked 2 <sup>nd</sup> relative to other reference sites			
	Sensitivity	Low to Moderate (2-6)			

\*as reported by project's Technical Appendix/Environmental Statement.

**Table 6-7 Pipistrelle species Average Annual Site Activity Levels – Bat Passes Per Hour**

Species		Site A	Site B	Site C	Site D
Pipistrelle spp.	Bat passes per hour	0.02	11.24	0.00	-
	Sensitivity*	Low	Low	Moderate to High	-
Proposed Development	Bat passes per hour	(0.48) ranked 2 <sup>nd</sup> relative to other reference sites			
	Sensitivity	Low to Moderate (2-6)			

\*as reported by project's Technical Appendix/Environmental Statement.

**Table 6-8 Nyctalus Species Average Annual Site Activity Levels – Bat Passes Per Hour**

Species		Site A	Site B	Site C	Site D
Nyctalus spp.	Bat passes per hour	0.02	-	0.01	-
	Sensitivity*	Low	-	Low	Low
Proposed Development	Bat passes per hour	(0.01) ranked 2 <sup>nd</sup> relative to other reference sites			
	Sensitivity	Low (2)			

\*as reported by project's Technical Appendix/Environmental Statement.

### 6.3.2 Step 2, 3 and 4: Collision Risk, Population Relative Abundance and Potential Vulnerability

**Table 6-9** details the collision risk, population relative abundance and potential vulnerability of the bat species recorded at the Proposed Development.

**Table 6-9: Collision Risk, Population Relative Abundance and Potential Vulnerability**

Bat Species	Collision Risk	Population Relative Abundance	Potential Vulnerability
Soprano pipistrelle	High	Common	Medium
Common pipistrelle	High	Common	Medium
Daubenton's	Low	Rarer	Low
Brown long-eared	Low	Rarer	Low
Nyctalus spp.	High	Rarest	High
Nathusius' pipistrelle	High	Rarest	High
Natterer's	Low	Rarer	Low

### 6.3.3 Step 5: Categorising Site Risk Level

The site risk level is determined by project size and habitat risk (see

**Table 4-4**). The Proposed Development consists of 19 turbines that are over 50 m in height, and so falls within the 'Medium' project size, as shown in

**Table 4-4** and **Table C-1** of **Annex C**.

In terms of habitat risk for bats, there are no buildings, structures, or trees with moderate and/or high bat roosting potential within 200 m plus the rotor radius of turbines. Foraging habitat quality and connectivity within this buffer area is low with a largely treeless environment and small open upland burns and a fairly homogenous area of open grazed moorland habitat present, resulting in a habitat risk classification of '**Low**' as shown in

Table 4-4 and Table C-1 of Annex C.

According to

Table 4-4 above, the 'Medium' project size combined with a 'Low' habitat risk level results in an overall site risk assessment of 'Low/Lowest' (2).

#### 6.3.4 Step 6: Risk Assessment – High Collision Risk Species Only

The overall risk assessment is undertaken for high collision risk species which were identified at the site. Low-risk species have a low risk of collision with a turbine blade, so the impact of the Proposed Development on the local bat population would likely be negligible.

The overall risk assessment involves combining the site's risk level (Section 4.3.5,

Table 4-4) with the average reference site bat activity levels (Section 4.3.1) to calculate the typical (mean) site risk level (Table 4-5).

Table 6-10 combines the seasonal data and summarises the overall risk assessment score for high-risk species based on the average reference site comparison for the Proposed Development. The overall site risk scores for all high collision risk species based on the comparison were 'Low – Moderate' (2 – 6) for *Pipistrelle* spp., and Low (2) for *Nyctalus*.

**Table 6-10: Risk Assessment Scores Based on average comparison Reference Site for High Collision Risk Species**

Species	Risk Assessment Score based on average comparison Reference Site
Common pipistrelle	Low - Moderate (2 - 6)
Soprano pipistrelle	Low - Moderate (2 - 6)
Nathusius' pipistrelle	Low – Moderate (2 - 6)
<i>Nyctalus</i> spp.	Low (2)

Figures 8.7 - 8.10 illustrate the results of the mean seasonal bat activity for high collision risk bat species recorded at the Proposed Development at each survey location, illustrating how bat activity and risk levels varies within the site across the year and by species. This data is also presented in Table E-1 of Annex E which includes the mean bat passes per hour, mean bat passes per night and maximum bat activity (bat passes per night).

The maximum bat passes per night ranges from 1 to 96, generally the mean bat passes per hour is considered Low.

## 7 REFERENCES

Andrews, H. (2018). *Bat Roosts in Trees: a guide for identification and assessment for tree-care and ecology professionals*. Pelagic Publishing, Exeter.

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

Mammal Society (2017). *Ecobat*. Available at: <http://www.mammal.org.uk/science-research/ecostat/>.

NatureScot, Natural England, Natural Resources Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT). (August 2021). *Bats and Onshore Wind Turbines: Survey Assessment and Mitigation*.

Reason, P.F., Newson, S.E. & Jones, K.E. (2016). *Recommendations for using automatic bat identification software with full spectrum recordings*. Bat Conservation Trust.

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

Russ, J. (2012). *British Bat Calls: A Guide to species Identification*. Pelagic Publishing.

## ANNEX A. BATS LEGAL STATUS

The information contained in this Annex is a summarised version of the legislation and should be read in conjunction with the appropriate legislation.

All bat species receive protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)<sup>13</sup>.

For any wild bat species, it is an offence to deliberately or recklessly:

- capture, injure or kill a bat;
- harass a bat or group of bats;
- disturb a bat in a roost (any structure or place it uses for shelter or protection);
- disturb a bat while it is rearing or otherwise caring for its young;
- obstruct access to a bat roost or otherwise deny an animal use of a roost;
- disturb a bat in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species;
- disturb a bat in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young; and
- disturb a bat while it is migrating or hibernating.

It's also an offence to:

- damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly); and
- keep, transport, sell or exchange, or offer for sale or exchange any wild bat (or any part or derivative of one) obtained after 10 June 1994<sup>14</sup>.

---

<sup>13</sup> Sections 39(1) – (3).

<sup>14</sup> Available online: <https://www.nature.scot/professional-advice/protected-areas-and-species/protected-species/protected-species-z-guide/protected-species-bats> [Accessed August 2023].

Table A-1 Legal and Conservation Status of all UK Bats<sup>15</sup>

Species	Legislation / Convention													
	Bern Convention Appendix II	Bonn Convention Appendix II	WCA	Habitats Directive Annex IV	Habitats Directive Annex II	Habs Regs 1994 (as amended) Scotland	Conservation of Habs & Species Regs 2010	Conservation Regs (N Ireland) 1995	CROW Act 2000	NERC Act 2006	Wild Mammals Protection Act	UK BAP Priority species	IUCN Red List*	EUROBATS Agreement
Greater horseshoe bat	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	LC	✓
Lesser horseshoe bat	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	LC	✓
Daubenton's bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Natterer's bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Whiskered bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Brandt's bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Bechstein's bat	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NT	✓
Alcathoe bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		DD	✓
Noctule	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	LC	✓
Leisler's bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Serotine	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Common pipistrelle	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Soprano pipistrelle	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	LC	✓
Nathusius' pipistrelle	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Brown long-eared bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	LC	✓
Grey long-eared bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Barbastelle	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NT	✓
Greater mouse-eared bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓

\*IUCN categories: LC is Least Concern, NT is Near Threatened, DD is Data deficient; see [www.iucnredlist.org](http://www.iucnredlist.org) for more details.

<sup>15</sup> Source: Bat Conservation Trust. Available online: [http://www.bats.org.uk/pages/bats\\_and\\_the\\_law.html](http://www.bats.org.uk/pages/bats_and_the_law.html) [Accessed August 2023].

## ANNEX B. SURVEY TIMINGS & ANABAT LOCATIONS

Table B-1 Description of Anabat Locations and Summary of Temporal Survey Effort

Location	Easting	Northing	Bearing	Habitat	Total Number of Complete Recording Nights			
					Visit 1 31/05/2022 – 20/06/2022	Visit 2 20/07/2022 – 03/08/2022	Visit 3 08/09/2022 – 22/09/2022	Visit 4 07/10/2022 – 21/10/2022
1	331999	653946		Within 70 m of Black Burn	16	14	2	-
1B**	331994	653941	0	Within 70 m of Black Burn	-	-	-	14
2	332146	653507		Within 100 m of Black Burn	16	14	13	-
4	332668	653392		Within 80 m of tributary to Black Burn	16	13	1	-
4B**	332692	653395	56	Within 100 m of tributary to Black Burn	-	-	-	14
5	333220	653351		Within 80 m of tributary to Black Burn	3	14	14	-
7	332461	654371		Within 85 m of tributary to Black Burn	20	14	14	-
8	332951	654230	0	Within 165 m of conifer plantation	16	13	14	14
8**	332951	654230		Within 165 m of conifer plantation	-	-	-	14
10x*	333501	654221		Within 70 m of watercourse tributary	20	5	11	-
10	333501	654221		Within 70 m of watercourse tributary	16	14	14	-
12	334207	654237		Within 200 m of conifer plantation	16	1	0	-
12B**	334312	654166	335	By quarry	-	-	-	14
13x*	333969	654666		Within 135 m of conifer plantation	-	-	0	8
13	333969	654666		Within 135 m of conifer plantation	16	3	14	-
13**	333969	654666		Within 135 m of conifer plantation	-	-	-	8
14	334776	654789		Within 100 m of tributary to Middleton North Burn	10	14	14	-
15	334447	655405	86	Open ground	16	14	14	14

Location	Easting	Northing	Bearing	Habitat	Total Number of Complete Recording Nights			
					Visit 1 31/05/2022 – 20/06/2022	Visit 2 20/07/2022 – 03/08/2022	Visit 3 08/09/2022 – 22/09/2022	Visit 4 07/10/2022 – 21/10/2022
15**	334447	655405		Open ground	-	-	-	14
17	335240	655183		Open ground	-	-	14	-
18	335785	655528		Open ground	20	8	-	-
19	335434	655900		Open ground	16	5	14	-
<b>Total</b>					<b>477 (555 Locations with **)</b>			

\*Removed from analysis as duplicate data from comparing zero-crossing and full-spectrum detectors

\*\*Additional MacArthur Green data



## ANNEX C. INITIAL SITE RISK ASSESSMENT

Table C-1 Initial Site Risk Assessment<sup>16</sup>.

Site Risk Level (1-5) <sup>17</sup>		Project Size		
		Small	Medium	Large
Habitat Risk	Low	1	2	3
	Moderate	2	3	4
	High	3	4	5
Key: Green (1-2) – low/lowest site risk; Amber (3) – medium site risk; Red (4-5) – high/highest site risk				
Habitat Risk	Description			
Low	Small number of potential roost features, of low quality. Low-quality foraging habitats that could be used by small numbers of foraging bats. Isolated site not connected to the wider landscape by prominent linear features.			
Moderate	Buildings, trees or other structures with moderate-high potential as roost sites on or near the site. Habitat could be used extensively by foraging bats. Site is connected to the wider landscape by linear features such as scrub, tree lines and streams.			
High	Numerous suitable buildings, trees (particularly mature ancient woodland) or other structures with moderate-high potential as roost sites on or near the site, and/or confirmed roosts present close to or on the site. Extensive and diverse habitat mosaic of high quality for foraging bats. Site is connected to the wider landscape by a network of strong linear features such as rivers, blocks of woodland and mature hedgerows. At/near edge of range and or an important flyway. Close to key roost and /or swarming.			
Project Size	Description			
Small	Small scale development (<10 turbines). No other wind energy developments within 10 km. Comprising turbines <50 m in height.			
Medium	Larger developments (between 10 and 40). May have some other wind development within 5 km. Comprising turbines 50 – 100 m in height.			
Large	Largest developments (>40 turbines) with other wind energy developments within 5 km. Comprising turbines >100 m in height.			

<sup>16</sup> Sourced from: NatureScot, Natural England, Natural Resources Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT). (2021). *Bats and Onshore Wind Turbines: Survey Assessment and Mitigation*.

<sup>17</sup> Some sites could conceivably be assessed as being of no (0) risk to bats. This assessment is only likely to be valid in more extreme environments, such as above the known altitudinal range of bats, or outside the known geographical distribution of any resident British species.

## ANNEX D. PRELIMINARY BAT ROOST ASSESSMENT

Table D-1 Preliminary Bat Roost Assessment Target Notes

PRF_ID	Feature	Notes	PRF Category	Grid Reference
PS009	Tree	Relatively small conifer plantation, mostly mature trees but no visible PRFs.	Negligible	NT 35914 55932
PS010	Tree	Relatively small conifer plantation, mostly mature trees but no visible PRFs.	Negligible	NT 35217 56210
PS015	Structure	Corrugated metal barn, with low potential for roosting opportunities where roof meets walls.	Low	NT 34987 55513
PS016	Tree	Conifer plantation of mostly thin, straight trees with no obvious PRFs.	Negligible	NT 34829 55493
PS017	Tree	Scots pine plantation and spruce plantation. Row of mature planted Scots pine (some with small cracks of low potential) lining a spruce plantation of negligible potential.	Low	NT 33758 55540
PS018	Tree	Mature birch and rowan, some of the larger ones have small cracks/fissures of low potential.	Low	NT 33603 55714
PS024	Structure	House with slate roof. Occupied so couldn't be inspected closely, however likely high roosting potential under slates and within and around eaves. Potential entries at 2-3m.	High	NT 33524 55671
PS025	Structure	Barn and outbuilding which was not approached closely (occupied). Likely moderate roosting potential within and around where roof meets walls. Potential entrance at 4-5m.	Moderate	NT 33489 55644
PS026	Tree	Row of mostly semi-mature Scots pines with no obvious PRFs.	Negligible	NT 32816 56775
PS027	Tree	Row of conifers and beech along field boundaries. All semi-mature with low roosting potential, apart from five trees (listed under D1-D5)	Low	NT 33045 56814
PS028	Tree	Beech with cavity where bough has broken off, at about 3m.	Moderate	NT 33059 56798
PS029	Tree	Beech with a larger cavity at 3m where bough has broken.	Moderate	NT 33109 56787
PS030	Tree	Dead beech with two woodpecker holes at 3-4m.	Moderate	NT 33115 56797
PS031	Tree	Beech with crack where branch has broken off at 4m.	Moderate	NT 33195 56782
PS032	Tree	Two adjacent beech trees with rot holes at 2m.	Moderate	NT 33217 56782
PS033	Tree	Mostly semi-mature thin birch and rowan planted Scots pine and non-native conifers of negligible potential, apart from two trees (listed E1, E2).	Negligible	NT 33096 56374
PS034	Tree	Standing dead pine at edge of clearfell with several woodpecker holes and a large crack.	Moderate	NT 33116 56337
PS035	Tree	Elm at edge of woodland with a crack of moderate potential.	Moderate	NT 33168 56072
PS036	Structure	Small, corrugated metal shed by sheep wash of low roosting potential.	Low	NT 32995 56463

PRF_ID	Feature	Notes	PRF Category	Grid Reference
PS037	Tree	Row of beech by sheep wash, mostly of low potential, but with one dead beech with three woodpecker holes of moderate potential (3m).	Moderate	NT 32965 56504
PS038	Tree	Large plantation of mostly Scots pine and larch, mostly with no obvious PRFs. A few larger trees with small cracks of low potential.	Low	NT 32305 55492
PS044	Tree	Group of birch, alder and willow around small lochan and up edges of Black Burn with no obvious PRFs.	Negligible	NT 31100 54300
PS045	Tree	Patch of relatively small birch with no obvious PRFs.	Negligible	NT 32463 53814
PS049	Tree	Plantation of young spruce, no obvious PRFs.	Negligible	NT 33827 55422
PS050	Tree	Small plantation of mature spruce, no obvious PRFs.	Negligible	NT 34142 54080
PS051	Tree	Large bark fissure low on tree, doesn't go up into trunk. Fairly large crack high up on trunk.	Low	NT 32801 54763
PS052	Tree	Cracks on bark on multiple parts of tree, none very deep.	Low	NT 32740 54759
PS053	Tree	Small plantation of mature spruce, no obvious PRFs.	Negligible	NT 32887 54688
PS056	Tree	Dead Scots pine with single woodpecker hole ~5m up.	Low	NT 31352 55257
PS057	Tree	Dead Scots pine with multiple woodpecker holes.	Moderate	NT 31818 55034
PS058	Tree	Plantation with young spruce, no obvious PRFs.	Negligible	NT 31621 55137
PS059	Tree	Group of mature Scots pine, no obvious PRFs.	Negligible	NT 31525 54163
PS062	Tree	Large hole in trunk that looks like it continues upwards.	Moderate	NT 31100 52745
PS063	Tree	Line of mature beech trees along a fence line. All of a size with potential to support potential roost features. Double leaders, broken branches, knot holes all noted.	Moderate	NT 31171 52805
PS069	Tree	Group of mature Scots pine with knot holes, twisted branches and splits.	Moderate	NT 31475 54072
PS071	Tree	Of a size and age likely to offer multiple PRFs. Doubler leader and broken branches.	Moderate	NT 31176 52625

## ANNEX E. SEASONAL LOCATION SPECIFIC DATA

Table E- 1 Seasonal Location Specific Data for all Species

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc1	Common pipistrelle	Spring	57	9.125	1.141	High
loc1	Common pipistrelle	Summer	5	0.714	0.079	Moderate to High
loc1	Common pipistrelle	Autumn	16	8.000	0.667	High
loc1	Common pipistrelle	Additional Autumn	3	0.214	0.015	Low to Moderate
loc2	Common pipistrelle	Spring	31	6.125	0.766	High
loc2	Common pipistrelle	Summer	3	0.500	0.056	Moderate to High
loc2	Common pipistrelle	Autumn	32	4.231	0.353	High
loc4	Common pipistrelle	Spring	96	8.000	1.000	High
loc4	Common pipistrelle	Summer	0	0.000	0.000	No Activity
loc4	Common pipistrelle	Autumn	0	0.000	0.000	No Activity
loc4	Common pipistrelle	Additional Autumn	6	0.429	0.030	Moderate
loc5	Common pipistrelle	Spring	20	7.000	0.875	High
loc5	Common pipistrelle	Summer	6	0.429	0.048	Moderate
loc5	Common pipistrelle	Autumn	7	0.571	0.048	Moderate
loc7	Common pipistrelle	Spring	24	0.000	0.000	No Activity
loc7	Common pipistrelle	Summer	1	0.050	0.006	Low
loc7	Common pipistrelle	Autumn	4	0.643	0.054	Moderate
loc8	Common pipistrelle	Spring	14	2.250	0.281	High
loc8	Common pipistrelle	Summer	2	0.308	0.034	Moderate

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc8	Common pipistrelle	Autumn	6	0.786	0.065	Moderate to High
loc8	Common pipistrelle	Additional Autumn	2	0.143	0.010	Low to Moderate
loc10	Common pipistrelle	Spring	16	0.000	0.000	No Activity
loc10	Common pipistrelle	Summer	3	0.714	0.079	Moderate to High
loc10	Common pipistrelle	Autumn	4	0.727	0.061	Moderate to High
loc12	Common pipistrelle	Spring	41	5.250	0.656	High
loc12	Common pipistrelle	Summer	0	0.000	0.000	No Activity
loc12	Common pipistrelle	Additional Autumn	2	0.143	0.010	Low to Moderate
loc13	Common pipistrelle	Spring	15	1.875	0.234	Moderate to High
loc13	Common pipistrelle	Summer	1	0.333	0.037	Moderate
loc13	Common pipistrelle	Autumn	8	0.000	0.000	No Activity
loc13	Common pipistrelle	Additional Autumn	0	0.000	0.000	No Activity
loc14	Common pipistrelle	Spring	13	4.100	0.513	High
loc14	Common pipistrelle	Summer	4	0.643	0.071	Moderate to High
loc14	Common pipistrelle	Autumn	34	2.929	0.244	Moderate to High
loc15	Common pipistrelle	Spring	0	0.000	0.000	No Activity
loc15	Common pipistrelle	Summer	3	0.786	0.087	Moderate to High
loc15	Common pipistrelle	Autumn	16	2.714	0.226	Moderate to High
loc15	Common pipistrelle	Additional Autumn	4	0.357	0.025	Moderate
loc17	Common pipistrelle	Autumn	71	6.429	0.536	High
loc18	Common pipistrelle	Spring	27	5.600	0.700	High
loc19	Common pipistrelle	Spring	10	4.625	0.578	High

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc18	Common pipistrelle	Summer	24	1.813	0.201	Moderate to High
loc19	Common pipistrelle	Summer	8	2.200	0.244	High
loc19	Common pipistrelle	Autumn	7	1.714	0.143	Moderate to High
loc1	Soprano pipistrelle	Spring	45	10.438	1.305	High
loc1	Soprano pipistrelle	Summer	13	2.429	0.270	High
loc1	Soprano pipistrelle	Autumn	9	4.500	0.375	High
loc1	Soprano pipistrelle	Additional Autumn	8	0.786	0.054	Moderate
loc2	Soprano pipistrelle	Spring	42	8.938	1.117	High
loc2	Soprano pipistrelle	Summer	3	1.286	0.143	Moderate to High
loc2	Soprano pipistrelle	Autumn	37	5.308	0.442	High
loc4	Soprano pipistrelle	Spring	86	8.063	1.008	High
loc4	Soprano pipistrelle	Summer	0	0.000	0.000	No Activity
loc4	Soprano pipistrelle	Autumn	0	0.000	0.000	No Activity
loc4	Soprano pipistrelle	Additional Autumn	47	3.429	0.236	Moderate to High
loc5	Soprano pipistrelle	Spring	8	3.333	0.417	High
loc5	Soprano pipistrelle	Summer	3	0.786	0.087	Moderate to High
loc5	Soprano pipistrelle	Autumn	5	0.857	0.071	Moderate to High
loc7	Soprano pipistrelle	Spring	36	4.750	0.594	High
loc7	Soprano pipistrelle	Summer	5	0.400	0.044	Moderate
loc7	Soprano pipistrelle	Autumn	10	1.714	0.143	Moderate to High
loc8	Soprano pipistrelle	Spring	17	3.125	0.391	High
loc8	Soprano pipistrelle	Summer	3	0.385	0.043	Moderate

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc8	Soprano pipistrelle	Autumn	6	1.143	0.095	Moderate to High
loc8	Soprano pipistrelle	Additional Autumn	0	0.000	0.000	No Activity
loc10	Soprano pipistrelle	Spring	22	0.000	0.000	No Activity
loc10	Soprano pipistrelle	Summer	9	1.429	0.159	Moderate to High
loc10	Soprano pipistrelle	Autumn	2	0.636	0.053	Moderate
loc12	Soprano pipistrelle	Spring	33	4.563	0.570	High
loc12	Soprano pipistrelle	Summer	2	2.000	0.222	Moderate to High
loc12	Soprano pipistrelle	Additional Autumn	1	0.071	0.005	Low
loc13	Soprano pipistrelle	Spring	18	2.375	0.297	High
loc13	Soprano pipistrelle	Summer	1	1.000	0.111	Moderate to High
loc13	Soprano pipistrelle	Autumn	4	0.000	0.000	No Activity
loc13	Soprano pipistrelle	Additional Autumn	0	0.000	0.000	No Activity
loc14	Soprano pipistrelle	Spring	16	2.400	0.300	High
loc14	Soprano pipistrelle	Summer	5	0.929	0.103	Moderate to High
loc14	Soprano pipistrelle	Autumn	27	3.214	0.268	High
loc15	Soprano pipistrelle	Spring	0	0.000	0.000	No Activity
loc15	Soprano pipistrelle	Summer	7	1.571	0.175	Moderate to High
loc15	Soprano pipistrelle	Autumn	20	3.357	0.280	High
loc15	Soprano pipistrelle	Additional Autumn	4	0.500	0.034	Moderate
loc17	Soprano pipistrelle	Autumn	26	5.071	0.423	High
loc18	Soprano pipistrelle	Spring	14	2.150	0.269	High
loc19	Soprano pipistrelle	Spring	39	1.750	0.219	Moderate to High

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc18	Soprano pipistrelle	Summer	5	4.188	0.465	High
loc19	Soprano pipistrelle	Summer	6	1.800	0.200	Moderate to High
loc19	Soprano pipistrelle	Autumn	7	1.500	0.125	Moderate to High
loc1	Daubenton's	Spring	2	0.375	0.047	Moderate
loc1	Daubenton's	Summer	1	0.143	0.016	Low to Moderate
loc1	Daubenton's	Autumn	0	0.000	0.000	No Activity
loc1	Daubenton's	Additional Autumn	0	0.000	0.000	No Activity
loc2	Daubenton's	Spring	1	0.063	0.008	Low
loc2	Daubenton's	Summer	1	0.071	0.008	Low
loc2	Daubenton's	Autumn	0	0.000	0.000	No Activity
loc4	Daubenton's	Spring	1	0.125	0.016	Low to Moderate
loc4	Daubenton's	Summer	0	0.000	0.000	No Activity
loc4	Daubenton's	Autumn	0	0.000	0.000	No Activity
loc4	Daubenton's	Additional Autumn	7	0.571	0.039	Moderate
loc5	Daubenton's	Spring	2	2.333	0.292	High
loc5	Daubenton's	Summer	3	0.214	0.024	Low to Moderate
loc5	Daubenton's	Autumn	6	0.714	0.060	Moderate to High
loc7	Daubenton's	Spring	1	0.050	0.006	Low
loc7	Daubenton's	Summer	1	0.357	0.040	Moderate
loc7	Daubenton's	Autumn	1	0.286	0.024	Low to Moderate
loc8	Daubenton's	Spring	2	0.250	0.031	Moderate
loc8	Daubenton's	Summer	1	0.231	0.026	Moderate



Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc8	Daubenton's	Autumn	1	0.143	0.012	Low to Moderate
loc8	Daubenton's	Additional Autumn	1	0.071	0.005	Low
loc10	Daubenton's	Spring	1	0.000	0.000	No Activity
loc10	Daubenton's	Summer	1	0.071	0.008	Low
loc10	Daubenton's	Autumn	1	0.182	0.015	Low to Moderate
loc12	Daubenton's	Spring	12	1.625	0.203	Moderate to High
loc12	Daubenton's	Summer	0	0.000	0.000	No Activity
loc12	Daubenton's	Additional Autumn	1	0.071	0.005	Low
loc13	Daubenton's	Spring	2	0.438	0.055	Moderate
loc13	Daubenton's	Summer	0	0.000	0.000	No Activity
loc13	Daubenton's	Autumn	2	0.000	0.000	No Activity
loc13	Daubenton's	Additional Autumn	0	0.000	0.000	No Activity
loc14	Daubenton's	Spring	0	0.000	0.000	No Activity
loc14	Daubenton's	Summer	2	0.357	0.040	Moderate
loc14	Daubenton's	Autumn	2	0.286	0.024	Low to Moderate
loc15	Daubenton's	Spring	1	0.063	0.008	Low
loc15	Daubenton's	Summer	1	0.143	0.016	Low to Moderate
loc15	Daubenton's	Autumn	1	0.214	0.018	Low to Moderate
loc15	Daubenton's	Additional Autumn	0	0.000	0.000	No Activity
loc17	Daubenton's	Autumn	3	0.286	0.024	Low to Moderate
loc18	Daubenton's	Spring	2	0.200	0.025	Moderate
loc19	Daubenton's	Spring	1	0.000	0.000	No Activity

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc18	Daubenton's	Summer	0	0.063	0.007	Low
loc19	Daubenton's	Summer	1	0.400	0.044	Moderate
loc19	Daubenton's	Autumn	0	0.000	0.000	No Activity
loc1	Noctule	Spring	0	0.000	0.000	No Activity
loc1	Noctule	Summer	0	0.000	0.000	No Activity
loc1	Noctule	Autumn	2	1.000	0.083	Moderate to High
loc1	Noctule	Additional Autumn	0	0.000	0.000	No Activity
loc2	Noctule	Spring	0	0.000	0.000	No Activity
loc2	Noctule	Summer	1	0.071	0.008	Low
loc2	Noctule	Autumn	1	0.154	0.013	Low to Moderate
loc4	Noctule	Spring	0	0.000	0.000	No Activity
loc4	Noctule	Summer	0	0.000	0.000	No Activity
loc4	Noctule	Autumn	0	0.000	0.000	No Activity
loc4	Noctule	Additional Autumn	0	0.000	0.000	No Activity
loc5	Noctule	Spring	0	0.000	0.000	No Activity
loc5	Noctule	Summer	2	0.214	0.024	Low to Moderate
loc5	Noctule	Autumn	1	0.071	0.006	Low
loc7	Noctule	Spring	0	0.000	0.000	No Activity
loc7	Noctule	Summer	0	0.000	0.000	No Activity
loc7	Noctule	Autumn	1	0.050	0.004	Low
loc8	Noctule	Spring	0	0.000	0.000	No Activity
loc8	Noctule	Summer	0	0.000	0.000	No Activity

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc8	Noctule	Autumn	0	0.000	0.000	No Activity
loc8	Noctule	Additional Autumn	1	0.071	0.005	Low
loc10	Noctule	Spring	0	0.000	0.000	No Activity
loc10	Noctule	Summer	2	0.214	0.024	Low to Moderate
loc10	Noctule	Autumn	1	0.182	0.015	Low to Moderate
loc12	Noctule	Spring	0	0.000	0.000	No Activity
loc12	Noctule	Summer	0	0.000	0.000	No Activity
loc12	Noctule	Additional Autumn	2	0.143	0.010	Low to Moderate
loc13	Noctule	Spring	0	0.000	0.000	No Activity
loc13	Noctule	Summer	0	0.000	0.000	No Activity
loc13	Noctule	Autumn	0	0.000	0.000	No Activity
loc13	Noctule	Additional Autumn	0	0.000	0.000	No Activity
loc14	Noctule	Spring	0	0.000	0.000	No Activity
loc14	Noctule	Summer	0	0.000	0.000	No Activity
loc14	Noctule	Autumn	1	0.286	0.024	Low to Moderate
loc15	Noctule	Spring	0	0.000	0.000	No Activity
loc15	Noctule	Summer	2	0.143	0.016	Low to Moderate
loc15	Noctule	Autumn	1	0.071	0.006	Low
loc15	Noctule	Additional Autumn	0	0.000	0.000	No Activity
loc17	Noctule	Autumn	1	0.214	0.018	Low to Moderate
loc18	Noctule	Spring	1	0.050	0.006	Low
loc19	Noctule	Spring	1	0.125	0.016	Low to Moderate

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc18	Noctule	Summer	1	0.063	0.007	Low
loc19	Noctule	Summer	0	0.000	0.000	No Activity
loc19	Noctule	Autumn	1	0.143	0.012	Low to Moderate
loc1	Brown long-eared	Spring	1	0.063	0.008	Low
loc1	Brown long-eared	Summer	1	0.071	0.008	Low
loc1	Brown long-eared	Autumn	0	0.000	0.000	No Activity
loc1	Brown long-eared	Additional Autumn	0	0.000	0.000	No Activity
loc2	Brown long-eared	Spring	1	0.063	0.008	Low
loc2	Brown long-eared	Summer	1	0.071	0.008	Low
loc2	Brown long-eared	Autumn	1	0.231	0.019	Low to Moderate
loc4	Brown long-eared	Spring	0	0.000	0.000	No Activity
loc4	Brown long-eared	Summer	0	0.000	0.000	No Activity
loc4	Brown long-eared	Autumn	0	0.000	0.000	No Activity
loc4	Brown long-eared	Additional Autumn	2	0.143	0.010	Low to Moderate
loc5	Brown long-eared	Spring	1	1.000	0.125	Moderate to High
loc5	Brown long-eared	Summer	0	0.000	0.000	No Activity
loc5	Brown long-eared	Autumn	1	0.143	0.012	Low to Moderate
loc7	Brown long-eared	Spring	0	0.000	0.000	No Activity
loc7	Brown long-eared	Summer	2	0.100	0.011	Low to Moderate
loc7	Brown long-eared	Autumn	1	0.100	0.008	Low to Moderate
loc8	Brown long-eared	Spring	1	0.063	0.008	Low
loc8	Brown long-eared	Summer	0	0.000	0.000	No Activity

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc8	Brown long-eared	Autumn	1	0.071	0.006	Low
loc8	Brown long-eared	Additional Autumn	0	0.000	0.000	No Activity
loc10	Brown long-eared	Spring	0	0.000	0.000	No Activity
loc10	Brown long-eared	Summer	0	0.000	0.000	No Activity
loc10	Brown long-eared	Autumn	1	0.091	0.008	Low
loc12	Brown long-eared	Spring	0	0.000	0.000	No Activity
loc12	Brown long-eared	Summer	1	1.000	0.111	Moderate to High
loc12	Brown long-eared	Additional Autumn	1	0.071	0.005	Low
loc13	Brown long-eared	Spring	1	0.125	0.016	Low to Moderate
loc13	Brown long-eared	Summer	0	0.000	0.000	No Activity
loc13	Brown long-eared	Autumn	1	0.000	0.000	No Activity
loc13	Brown long-eared	Additional Autumn	1	0.125	0.009	Low to Moderate
loc14	Brown long-eared	Spring	1	0.100	0.013	Low to Moderate
loc14	Brown long-eared	Summer	1	0.071	0.008	Low
loc14	Brown long-eared	Autumn	2	0.429	0.036	Moderate
loc15	Brown long-eared	Spring	0	0.000	0.000	No Activity
loc15	Brown long-eared	Summer	1	0.143	0.016	Low to Moderate
loc15	Brown long-eared	Autumn	1	0.071	0.006	Low
loc15	Brown long-eared	Additional Autumn	1	0.143	0.010	Low to Moderate
loc17	Brown long-eared	Autumn	2	0.357	0.030	Moderate
loc18	Brown long-eared	Spring	0	0.000	0.000	No Activity
loc19	Brown long-eared	Spring	0	0.375	0.047	Moderate

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc18	Brown long-eared	Summer	1	0.000	0.000	No Activity
loc19	Brown long-eared	Summer	0	0.000	0.000	No Activity
loc19	Brown long-eared	Autumn	1	0.071	0.006	Low
loc1	Natterer's	Spring	1	0.063	0.008	Low
loc1	Natterer's	Summer	0	0.000	0.000	No Activity
loc1	Natterer's	Autumn	0	0.000	0.000	No Activity
loc1	Natterer's	Additional Autumn	0	0.000	0.000	No Activity
loc2	Natterer's	Spring	0	0.000	0.000	No Activity
loc2	Natterer's	Summer	0	0.000	0.000	No Activity
loc2	Natterer's	Autumn	0	0.000	0.000	No Activity
loc4	Natterer's	Spring	0	0.000	0.000	No Activity
loc4	Natterer's	Summer	0	0.000	0.000	No Activity
loc4	Natterer's	Autumn	0	0.000	0.000	No Activity
loc4	Natterer's	Additional Autumn	1	0.071	0.005	Low
loc5	Natterer's	Spring	0	0.000	0.000	No Activity
loc5	Natterer's	Summer	0	0.000	0.000	No Activity
loc5	Natterer's	Autumn	0	0.000	0.000	No Activity
loc7	Natterer's	Spring	0	2.700	0.338	High
loc7	Natterer's	Summer	0	0.000	0.000	No Activity
loc7	Natterer's	Autumn	0	0.000	0.000	No Activity
loc8	Natterer's	Spring	0	0.000	0.000	No Activity
loc8	Natterer's	Summer	0	0.000	0.000	No Activity

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc8	Natterer's	Autumn	0	0.000	0.000	No Activity
loc8	Natterer's	Additional Autumn	0	0.000	0.000	No Activity
loc10	Natterer's	Spring	0	0.000	0.000	No Activity
loc10	Natterer's	Summer	0	0.000	0.000	No Activity
loc10	Natterer's	Autumn	0	0.000	0.000	No Activity
loc12	Natterer's	Spring	1	0.125	0.016	Low to Moderate
loc12	Natterer's	Summer	0	0.000	0.000	No Activity
loc12	Natterer's	Additional Autumn	0	0.000	0.000	No Activity
loc13	Natterer's	Spring	0	0.000	0.000	No Activity
loc13	Natterer's	Summer	0	0.000	0.000	No Activity
loc13	Natterer's	Autumn	0	0.000	0.000	No Activity
loc13	Natterer's	Additional Autumn	0	0.000	0.000	No Activity
loc14	Natterer's	Spring	0	0.000	0.000	No Activity
loc14	Natterer's	Summer	0	0.000	0.000	No Activity
loc14	Natterer's	Autumn	0	0.000	0.000	No Activity
loc15	Natterer's	Spring	0	0.000	0.000	No Activity
loc15	Natterer's	Summer	0	0.000	0.000	No Activity
loc15	Natterer's	Autumn	0	0.000	0.000	No Activity
loc15	Natterer's	Additional Autumn	0	0.000	0.000	No Activity
loc17	Natterer's	Autumn	0	0.000	0.000	No Activity
loc18	Natterer's	Spring	0	0.000	0.000	No Activity
loc19	Natterer's	Spring	0	0.000	0.000	No Activity

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc18	Natterer's	Summer	0	0.000	0.000	No Activity
loc19	Natterer's	Summer	0	0.000	0.000	No Activity
loc19	Natterer's	Autumn	0	0.000	0.000	No Activity
loc1	Leisler's	Spring	0	0.000	0.000	No Activity
loc1	Leisler's	Summer	0	0.000	0.000	No Activity
loc1	Leisler's	Autumn	0	0.000	0.000	No Activity
loc1	Leisler's	Additional Autumn	0	0.000	0.000	No Activity
loc2	Leisler's	Spring	0	0.000	0.000	No Activity
loc2	Leisler's	Summer	0	0.000	0.000	No Activity
loc2	Leisler's	Autumn	0	0.000	0.000	No Activity
loc4	Leisler's	Spring	0	0.000	0.000	No Activity
loc4	Leisler's	Summer	0	0.000	0.000	No Activity
loc4	Leisler's	Autumn	0	0.000	0.000	No Activity
loc4	Leisler's	Additional Autumn	0	0.000	0.000	No Activity
loc5	Leisler's	Spring	1	0.333	0.042	Moderate
loc5	Leisler's	Summer	0	0.000	0.000	No Activity
loc5	Leisler's	Autumn	0	0.000	0.000	No Activity
loc7	Leisler's	Spring	0	0.000	0.000	No Activity
loc7	Leisler's	Summer	0	0.000	0.000	No Activity
loc7	Leisler's	Autumn	0	0.000	0.000	No Activity
loc8	Leisler's	Spring	0	0.000	0.000	No Activity
loc8	Leisler's	Summer	0	0.000	0.000	No Activity



Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc8	Leisler's	Autumn	0	0.000	0.000	No Activity
loc8	Leisler's	Additional Autumn	0	0.000	0.000	No Activity
loc10	Leisler's	Spring	0	0.000	0.000	No Activity
loc10	Leisler's	Summer	0	0.000	0.000	No Activity
loc10	Leisler's	Autumn	0	0.000	0.000	No Activity
loc12	Leisler's	Spring	0	0.000	0.000	No Activity
loc12	Leisler's	Summer	0	0.000	0.000	No Activity
loc12	Leisler's	Additional Autumn	0	0.000	0.000	No Activity
loc13	Leisler's	Spring	0	0.000	0.000	No Activity
loc13	Leisler's	Summer	0	0.000	0.000	No Activity
loc13	Leisler's	Autumn	0	0.000	0.000	No Activity
loc13	Leisler's	Additional Autumn	0	0.000	0.000	No Activity
loc14	Leisler's	Spring	0	0.000	0.000	No Activity
loc14	Leisler's	Summer	0	0.000	0.000	No Activity
loc14	Leisler's	Autumn	0	0.000	0.000	No Activity
loc15	Leisler's	Spring	0	0.000	0.000	No Activity
loc15	Leisler's	Summer	0	0.000	0.000	No Activity
loc15	Leisler's	Autumn	0	0.000	0.000	No Activity
loc15	Leisler's	Additional Autumn	0	0.000	0.000	No Activity
loc17	Leisler's	Autumn	0	0.000	0.000	No Activity
loc18	Leisler's	Spring	0	0.000	0.000	No Activity
loc19	Leisler's	Spring	0	0.000	0.000	No Activity

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc18	Leisler's	Summer	0	0.000	0.000	No Activity
loc19	Leisler's	Summer	0	0.000	0.000	No Activity
loc19	Leisler's	Autumn	0	0.000	0.000	No Activity
loc1	Nathusius' pipistrelle	Spring	0	0.000	0.000	No Activity
loc1	Nathusius' pipistrelle	Summer	0	0.000	0.000	No Activity
loc1	Nathusius' pipistrelle	Autumn	0	0.000	0.000	No Activity
loc1	Nathusius' pipistrelle	Additional Autumn	0	0.000	0.000	No Activity
loc2	Nathusius' pipistrelle	Spring	0	0.000	0.000	No Activity
loc2	Nathusius' pipistrelle	Summer	0	0.000	0.000	No Activity
loc2	Nathusius' pipistrelle	Autumn	1	0.154	0.013	Low to Moderate
loc4	Nathusius' pipistrelle	Spring	0	0.000	0.000	No Activity
loc4	Nathusius' pipistrelle	Summer	0	0.000	0.000	No Activity
loc4	Nathusius' pipistrelle	Autumn	0	0.000	0.000	No Activity
loc4	Nathusius' pipistrelle	Additional Autumn	0	0.000	0.000	No Activity
loc5	Nathusius' pipistrelle	Spring	0	0.000	0.000	No Activity
loc5	Nathusius' pipistrelle	Summer	0	0.000	0.000	No Activity
loc5	Nathusius' pipistrelle	Autumn	1	0.071	0.006	Low
loc7	Nathusius' pipistrelle	Spring	1	0.050	0.006	Low
loc7	Nathusius' pipistrelle	Summer	0	0.000	0.000	No Activity
loc7	Nathusius' pipistrelle	Autumn	0	0.000	0.000	No Activity
loc8	Nathusius' pipistrelle	Spring	0	0.000	0.000	No Activity
loc8	Nathusius' pipistrelle	Summer	0	0.000	0.000	No Activity

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc8	Nathusius' pipistrelle	Autumn	0	0.000	0.000	No Activity
loc8	Nathusius' pipistrelle	Additional Autumn	1	0.071	0.005	Low
loc10	Nathusius' pipistrelle	Spring	0	0.000	0.000	No Activity
loc10	Nathusius' pipistrelle	Summer	0	0.000	0.000	No Activity
loc10	Nathusius' pipistrelle	Autumn	0	0.000	0.000	No Activity
loc12	Nathusius' pipistrelle	Spring	15	1.188	0.148	Moderate to High
loc12	Nathusius' pipistrelle	Summer	0	0.000	0.000	No Activity
loc12	Nathusius' pipistrelle	Additional Autumn	0	0.000	0.000	No Activity
loc13	Nathusius' pipistrelle	Spring	1	0.063	0.008	Low
loc13	Nathusius' pipistrelle	Summer	0	0.000	0.000	No Activity
loc13	Nathusius' pipistrelle	Autumn	0	0.000	0.000	No Activity
loc13	Nathusius' pipistrelle	Additional Autumn	0	0.000	0.000	No Activity
loc14	Nathusius' pipistrelle	Spring	2	0.200	0.025	Moderate
loc14	Nathusius' pipistrelle	Summer	0	0.000	0.000	No Activity
loc14	Nathusius' pipistrelle	Autumn	0	0.000	0.000	No Activity
loc15	Nathusius' pipistrelle	Spring	0	0.000	0.000	No Activity
loc15	Nathusius' pipistrelle	Summer	0	0.000	0.000	No Activity
loc15	Nathusius' pipistrelle	Autumn	0	0.000	0.000	No Activity
loc15	Nathusius' pipistrelle	Additional Autumn	0	0.000	0.000	No Activity
loc17	Nathusius' pipistrelle	Autumn	0	0.000	0.000	No Activity
loc18	Nathusius' pipistrelle	Spring	0	0.000	0.000	No Activity
loc19	Nathusius' pipistrelle	Spring	0	0.000	0.000	No Activity

Location ID	Species	Season	Maximum bat activity (bat passes per night)	Average bat activity (mean bat passes per night)	Average bat activity (mean bat passes per hour)	Bat Site Activity (based on bat passes per hour)
loc18	Nathusius' pipistrelle	Summer	0	0.000	0.000	No Activity
loc19	Nathusius' pipistrelle	Summer	0	0.000	0.000	No Activity
loc19	Nathusius' pipistrelle	Autumn	0	0.000	0.000	No Activity
loc12	Common pipistrelle	Autumn	0	0.000	0.000	No Data
loc12	Soprano pipistrelle	Autumn	0	0.000	0.000	No Data
loc12	Daubenton's	Autumn	0	0.000	0.000	No Data
loc12	Noctule	Autumn	0	0.000	0.000	No Data
loc12	Brown long-eared	Autumn	0	0.000	0.000	No Data
loc12	Natterer's	Autumn	0	0.000	0.000	No Data
loc12	Leisler's	Autumn	0	0.000	0.000	No Data
loc12	Nathusius' pipistrelle	Autumn	0	0.000	0.000	No Data