Appendix 7.3 Bat Survey Report

This page is intentionally blank.

Cumberhead West Wind Farm

Bat Survey Report

Technical Appendix 7.3

Date:	8th October 2020
Tel:	[redacted]
Web:	www.macarthurgreen.com
Address:	93 South Woodside Road | Glasgow | G20 6NT

Document Quality Record

Version	Status	Person Responsible	Date
0.1	Draft	Leanne Cooke	22/09/2020
0.2	Reviewed	Joanne Martindale	23/09/2020
0.3	Updated	Joanne Martindale	23/09/2020
1	Internal Approval	David H. MacArthur	10/10/2020

CONTENTS

LIST OF TABLES

FIGURES

1 INTRODUCTION

MacArthur Green was commissioned by the Applicant to carry out bat surveys for the Cumberhead West Wind Farm, approximately 4 km to the west of Coalburn, South Lanarkshire (hereafter referred to as the 'Proposed Development').

Bat surveys were undertaken to aid and inform the ecological impact assessment for the Cumberhead West Wind Farm Environmental Impact Assessment Report (EIAR Volume 2, Chapter 7).

This report presents the results of the bat survey work undertaken between May to September 2019 and from July to August 2020 including preliminary ground level roost assessments (PRA). Surveys were carried out within the Proposed Development site and study area which is shown in Figure 7.7 of the EIA Report.

Bat surveys included:

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

The aim of the surveys was to quantify site usage and variation of activity levels within the site in accordance with SNH et al. (2019).

2 THE PROPOSED DEVELOPMENT SITE AND STUDY AREA

The Proposed Development site ('the site') is located mainly within an area of active commercial forestry within the larger Cumberhead Forest complex, west of Douglas, South Lanarkshire. The site adjoins the existing cluster of operational and consented wind farms around Hagshaw Hill, known as the 'Hagshaw Cluster'.

The site extends over the existing Cumberhead Forest, consisting of commercial coniferous plantation and existing forestry tracks. There is also a small area of enclosed fields around Black Hill within the southeast of the site.

The site gradually rises from 320 m Above Ordnance Datum (AOD) in the north to 522 m AOD at the summit of Nutberry Hill in the south of the site. A number of watercourses run through the site, mainly Birkenhead Burn, Eaglin Burn, Long Burn, Logan Water and the River Nethan.

The surrounding land comprises open moorland to the west and south-west, farmland with some scattered individual properties to the north and north-east, with further coniferous plantation to the south and south-east.

The 'study area' in which bat surveys were undertaken covered the entirety of the site where new infrastructure would be constructed. It therefore excludes the length of access track which would be taken from the public road, using existing access track through Cumberhead Forest, because the access would make use of existing tracks. The exception to this is a short stretch of track which would be created for the Proposed Development if the proposed Douglas West Extension Wind

Farm is not built in advance. This 1.38 km section of new track has been assessed separately in Appendix 3.3 of the EIA Report. The study area is shown in Figure 7.7 of the EIA Report.

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* (3rd edn). The Bat Conservation Trust, London; and
- Scottish Natural Heritage, Natural England, Natural Resources Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT). (2019). *Bats and Onshore Wind Turbines: Survey Assessment and Mitigation*.

4 METHODS

4.1 Desk-Based Study

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

A National Biodiversity Network (NBN)[1] Atlas Scotland search was completed to obtain bat records from 2010 to 2020 within 10 km of the site.

South West Scotland Environmental Information Centre (SWSEIC) and Glasgow Museums Biological Record Centre (GMBRC) were contacted to provide bat records within 10 km of the site.

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,

[1] *NBN Atlas occurrence download at https://nbnatlas.org accessed on Mon Feb 17 14:16:22 UTC 2020.*

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.

The PRA was carried out within the study area, as shown in Figure 7.7.

4.2.2 Automated Activity Surveys

SNH *et al.* (2019) 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 2019 included 19 proposed wind turbines. A 19 turbine site requires 13 locations to be sampled. Detectors were placed at potential turbine locations across the site. Where proposed turbine locations within plantation habitat could not be reached, the nearest openings to these locations such as rides, tracks and clear-fell were sampled instead. Sampling open habitats such as these also provides an indication of how bats will adapt to and use new open habitats created through turbine construction. In 2020 two additional turbines were added to the Proposed Development design and these the two locations were also sampled from July to August in 2020. Detector locations are shown in Figure 7.7.

A total of three survey visits to the site were completed in June to July, July to August, and August to September for all 13 locations (locations 1 to 13) in 2019 with locations not altered throughout the survey period. Two turbine locations (locations 14 and 15) were added to the Proposed Development site in 2020 with two detectors deployed at the additional proposed turbine locations from July to August in 2020 for a total of 26 continuous nights. Detector locations are shown in Figure 7.7.

Anabat Express and Swift detectors recording zero-crossing files were deployed for a minimum period of ten consecutive nights across the site as recommended by SNH *et al.* (2019), and were positioned at a height of 2 m. Each detector recorded bats from dusk to dawn with detectors starting 30 minutes before dusk and finishing 30 minutes after dawn. Detector operating times are shown in Table B-2 of Annex B with a description of the habitat type at each location shown in Table B-3 of Annex B.

SNH *et al.* (2019) states that '*full spectrum automatic detectors should be deployed, as a minimum*'. SNH was consulted on the 21st March 2019 regarding the requirement for full spectrum detectors, following the publication of the new guidance. SNH advised that the use of zero-crossing detectors would be permitted with a transition over time towards full spectrum detectors. They recommended deploying a few full-spectrum detectors alongside the zero-crossing detectors at a subset of locations, so that detectability can be calibrated; this was incorporated into the survey method for the site. At location 9, an Anabat Express detector recording zero-crossing files was deployed alongside an Anabat Swift (Location 9R) detector set to full spectrum. The Express detector was deployed with a sensitive value of 8 (High). The full spectrum detector was deployed with the following settings:

- Sensitively value of 14;
- Minimum frequency of 15 kHz;

- Maximum frequency of 250 kHz;
- Minimum event of -2 ms; and
- Sampling rate of 320 kHz.

Data was analysed using Kaleidoscope 4 Auto ID classifier which assigns a species label to a sound file. To ensure that all non-*Pipistrellus* calls (excluding Nathusius' pipistrelle calls) were identified correctly by the software, they were manually reviewed by an experienced bat ecologist using Kaleidoscope Viewer and AnalookW software. This method of analysis is in line with current guidelines (Collins, 2016) for data analysis which recommends the manual checking of all non-*Pipistrellus* calls when using automated methods. Sound files labelled as noise were not reviewed. Guidance on call parameters was taken from Russ (2012).

For the purposed of this report and for Ecobat analysis, a single bat registration was classed as a single labelled Kaleidoscope file containing a sequence of bat pulses.

In line with SNH *et al.* (2019), further analysis of bat data was carried out using the secure online tool *Ecobat* (Mammal Society, 2017), to gain a measure of relative bat activity at the site. Ecobat data was then evaluated in accordance with SNH *et al.* (2019) guidance tables to determine the overall site risk level. The Ecobat analysis automatically analyses data per month and not per season. The results are presented based on this analysis per month.

4.3 Methods for Analysing Bat Activity Levels and Risks

SNH *et al.* (2019) 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

A measure of relative bat activity was obtained using the secure online tool *Ecobat* (Mammal Society, 2017) for automated data. SNH *et al.* (2019) explains that, "*The tool compares data entered by the user with bat survey information collected from similar areas at the same time of year and in comparable weather conditions…. Ecobat generates a percentile rank for each night of activity and provides a numerical way of interpreting the levels of bat activity recorded at a site across regions in Britain*". Table

4-1 below, taken from SNH *et al.* (2019) shows the five percentile categories for ease of reference. Only static data from automated activity surveys was analysed with the Ecobat tool.

The reference range data set were stratified to include:

- Only records from within 30 days of the survey date;
- Only records from within 100 km² of the survey location; and
- Records using any make/model of bat detector.

Table 4-1: Percentile Score and Categorised Level of Bat Activity[2]

Percentile Score	Bat Activity
81 to 100	High
61 to 80	Moderate to High
41 to 60	Moderate
21 to 40	Low to Moderate
0 to 20	Low

4.3.2 Step 2: Vulnerability to Collision

Annex 3 of SNH et al. (2019) presents a generic assessment of vulnerability to collision for UK species, based on species behaviour and flight characteristics. Table 4-2Table 4-2 provides a summary of the vulnerability of each bat species to collision.

Table 4-2: Vulnerability of Bat Species to Turbine Impact in the UK[2].

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 wind 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 (SNH *et al.* 2019).

[2] Table sourced from: Scottish Natural Heritage, Natural England, Natural Resources Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT). (2019). *Bats and Onshore Wind Turbines: Survey Assessment and Mitigation*.

4.3.3 Step 3: Population Relative Abundance

SNH *et al.* (2019) details the sensitivity of a bat species to impact based on their population's relative abundance in Scotland as detailed in Table 4-3. Species with the rarest relative abundance are more susceptible to significant effects.

Table 4-3: Population Relative Abundance of Bats in Scotland[2].

Relative Abundance	Species
Common	Common pipistrelle
	Soprano pipistrelle
Rarer	Brown long-eared bat
	Daubenton's bat
	Natterer's bat
Rarest	Whiskered bat
	Brandt's bat
	Nathusius' pipistrelle
	Noctule bat
	Leisler's bat

4.3.4 Step 4: Potential Vulnerability of Bat Populations

Table 4-4 below, sourced from SNH *et al.* (2019), uses the measure of collision risk, in combination with relative population 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 4-4: Level of Potential Vulnerability of Populations of British Bat Species[2].

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 4-5 to calculate the overall site risk level. The full matrix table, as provided within the SNH *et al.* (2019), is shown in Annex C which includes descriptions on how to determine the habitat risk and project size for the site.

Table 4-5: Initial Site Risk Assessment[2].

Site Risk Level (1-5) *	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

* 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 on-site and involves combining site risk level (Section 4.3.5, Table 4-5) with the Ecobat activity level (Section 4.3.1, Table 4-1). The overall risk assessment matrix is shown in Table 4-6 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 4-6: Overall Risk Assessment[2].

	Ecobat activity category (or equivalent justified categorisation)					
Site Risk Level	**Nil (0)**	**Low (1)**	**Low-Moderate (2)**	**Moderate (3)**	**Moderate-High (4)**	**High (5)**
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 site, and location of the site regarding the natural range of the species and how this could affect favourable conservation status.

Mitigation measures as detailed within SNH *et al.* (2019) 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 10 nights of recordings in each of spring (April - May), summer (June to mid-August) and autumn (Mid-August to October). In Scotland due to unfavourable weather conditions and low activity levels for bats in April, ground-level automated activity surveys, typically commence in May and are completed in September or mid-October (weather dependant). Surveys for the Proposed Development in 2019 did not include ground-level static detector surveys in May, with two survey visits completed in the summer (June to July and July to August) and one survey completed in the Autumn (August to September). To account for the absence of data in the spring, the second deployment period in the summer and the deployment period in autumn were increased beyond the required 10 nights of recording with a total recording period of 568 nights collected for the site, which is beyond the minimum number of nights recommended by SNH *et al.* (2019) for a site of this size. The increased collection of data in the summer and autumn is considered to have enabled a robust assessment of the bat activity on the site. The survey timings can be seen in Annex B, Tables B-1 and B-2.

Two turbine locations were added to the Proposed Development in 2020 with two detectors (locations 14 and 15) deployed at the proposed turbine locations from July to August for a total of 26 continuous nights, which captured the summer and autumn deployment periods. The minimum number of nights required according to guidance for two locations for a seasonal deployment period is 60 nights which was not achieved with only 52 nights recorded. The absence of data in the spring means that bat activity during this period at locations 14 and 15 were not recorded . However, when considering the number of locations in total sampled across the site (locations 1 to 15) and the overall number of nights recorded, the small absence of data at these locations, is not considered to have altered the overall assessment of risk for the site. The survey timings can be seen in Annex B, Tables B-1 and B-2.

Due to unforeseen errors with the detectors, microphones or batteries, it was not always possible to achieve ten consecutive nights of recordings recommended by SNH *et al.* (2019). As the majority of locations recorded for more than ten nights, with a total of 568 nights recorded for the site, which is beyond the minimum number of nights required for a site of this size, the small loss of data is not considered to have materially altered the overall assessment of risk. The survey timings can be seen in Annex B, Tables B-1 and B-2.

Some temporal calls were assigned an unknown value (NoID), due to the recording of a very faint call or an incomplete call that could not be identified to species level on the spectrogram. These were not considered further in the Ecobat analysis.

For some *Myotis* spp. calls it was only possible to identify the call to genus level. It is possible that for *Myotis* spp. these recordings could represent species not identified in the analysis of the recorded data. *Myotis* spp. bats are categorised as low collision risk species.

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 (*Plecotus auritus*), potentially being under-recorded.

An internal inspection was not carried out on the bungalow at Cumberhead or on the ruin at Eaglinside for health and safety reasons including the unknown presence of asbestos and structural stability of the buildings.

At location 9/9R, an Anabat Express detector recording zero-crossing files was deployed alongside an Anabat Swift detector set to full spectrum. The Anabat Express detector recorded a total of 2,306 registrations while the Anabat Swift full spectrum detector recorded 1,887 registrations. The Anabat Express detector recorded an additional species with a brown long-eared registration recorded. The registration difference in detectors at the same location highlights the suite of variables affecting how well bats are recorded including, whether the microphone gets wet, the difference in detectability between microphones, how close the bat passes the microphone, the detector type, and if a recording is filtered out as noise. As full spectrum detectors record bigger files, these detectors can often be set at a lower sensitively than zero--crossing detectors.

6 SURVEY RESULTS & ANALYSIS

6.1 Desk-Based Study

NBN Atlas returned records of the following bat species within 10 km of the Proposed Development site boundary:

- Common pipistrelle (*Pipistrellus pipistrellus*);
- Daubenton's bat (*Myotis daubentonii*); and
- Nathusius's pipistrelle (*Pipistrellus nathusii*).

SWSEIC returned records of the following bat species within 10 km of the Proposed Development site boundary;

- Pipistrelle bat species; and
- Soprano pipistrelle (*Pipistrellus pygmaeus*).

GMBRC were asked to provide records of bats within 10 km of the site however, no response was received.

6.2 Preliminary Bat Roost Assessment

Suitability for roosting bats was recorded within the study area at Cumberhead and Eaglinside (Figure 7.8).

An old derelict bungalow at Cumberhead is located at the end of a farm track which is surrounded by a rectangular block of mature broadleaved trees. The bungalow is constructed of brick and harling with a pitched slate roof. A long section of the bungalow was used for storage and as a working area with the doors to this section left open. At the back of the bungalow, there is a small kennel building with brick walls and a pitched slate roof. An external inspection was carried out and evidence of nesting swallows (*Hirundo rustica*) was seen but no evidence of bats was found. The bungalow and

the kennel were both assessed as having moderate summer and low winter bat roost suitability with numerous PRFs found such as gaps under tiles and broken windows.

An old ruin was located at Eaglinside. The small stone building is missing most of the roof with only a small section of the tile roof remaining with gaps under the tiles. The stone walls with exterior harling are exposed and crumbling with gaps present between the bricks. Due to the dilapidated nature of the building and its exposed nature, the old ruin was classified as having low suitability for summer and winter roosting bats.

The old derelict bungalow at Cumberhead is surrounded by a rectangular block of mature tree which are mainly composed of beech trees (*Fagus sylvatica*) with the occasional Scots pine (*Pinus sylvestris*). Trees within this block of woodland were found to have PRFs of high, moderate and low suitability. Due to the difficulty of identifying PRFs from the ground, especially when leaves are still on the trees during the summer months, trees that were seen to have the maturity and the size to contain PRFs, with no PRFs found at ground level, were given a precautionary classification of low suitability for roosting bats. Tree roosts can be used both as summer and winter roosts.

The PRFs recorded are not within 300 m of a proposed turbine locations and do not require further surveys.

PRF records are shown in Figure 7.8 with the results (target notes) listed in Table D-1, Annex D.

6.3 Automated Activity Surveys

MacArthur Green deployed detectors at 13 locations from June to September in 2019 with two additional locations surveyed from July to August in 2020 (see Table B-2 and B-3 of Annex B and Figure 7.8).

The survey results were processed using the Ecobat tool (Mammal Society, 2017) to gain a measure of relative bat activity at the Proposed Development site. The results are presented in Steps 1 – 6 below.

Between June to September 2019, bats were detected on 48 nights, using 13 static bat detectors at locations 1 to 13. A total of four bat species and two genus classifications were recorded for these locations: soprano pipistrelle, common pipistrelle, Daubenton's bat, brown long-eared bat, *Myotis* spp. and *Nyctalus* spp Table 6-1.

Table 6-1 Total Number of Bat Passes for Each Species Across all Locations

Species/Species Group	No of Registrations	Percentage of total (%)
Soprano pipistrelle	10,910	46.60
Common pipistrelle	10,193	43.54
Nyctalus spp.	1,710	7.30
Myotis spp.	550	2.35
Daubenton's	33	0.14
Brown long-eared	15	0.16
Total	23,411	100

6.3.1 Step 1: Bat Activity Levels

Average Annual Site Activity Levels

Table 6-2, Chart 6-1 and Chart 6-2 detail the average annual site activity levels calculated using the Ecobat tool (Mammal Society, 2017).

Data on the monthly activity levels per location for 2019 and 2020 is provided in Table E-1 of Annex E.

Table 6-2: Average Annual Site Activity Levels from 2019 (locations 1 to 13) and 2020 (locations 14 and 15) taken from Ecobat Analysis[3]

Species/ Group	Year	Locations	Median Percentile	Activity Level	95% Cis*	Max Percentile	Activity Level	Nights Recorded
Pipistrellus pipistrellus	2019	1 – 13	69	Moderate – High	84.5 90.5	99	High	331
Pipistrellus pygmaeus	2019	1 – 13	69	Moderate – High	85.5 – 90.5	100	High	341
Nyctalus spp.	2019	1 – 13	44	Moderate	37 – 62.5	94	High	301
Myotis spp.	2019	1 – 13	1	Low	29+ - 57	88	High	165
Myotis Daubentonii	2019	1 – 13	1	Low	30 - 30	51	Moderate	22
Plecotus auritus	2019	1 - 13	1	Low	1 – 15.5	30	Low to Moderate	13
Pipistrellus pipistrellus	2020	14 - 15	47	Moderate	35 - 58	85	High	34
Pipistrellus pygmaeus	2020	14 - 15	40	Low – Moderate	31 – 54.5	76	Moderate to High	34
Nyctalus spp.	2020	14 - 15	33	Low – Moderate	17 – 44.5	66	Moderate to High	28
Myotis spp.	2020	14 - 15	1	Low	1 - 1	1	Low	5

*Cis: confidence intervals.

[3] Taken from Ecobat analysis report created from automated activity data of the Proposed Development site in 2019 and 2020.

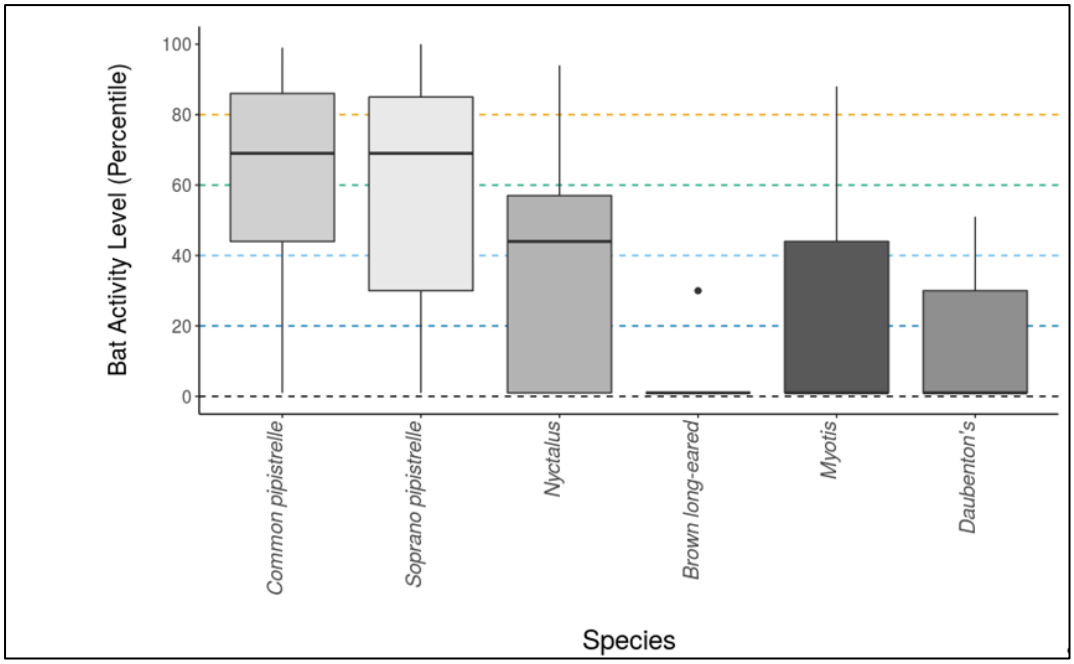

Chart 6-1: Average Annual Site Activity Levels 2019[3]

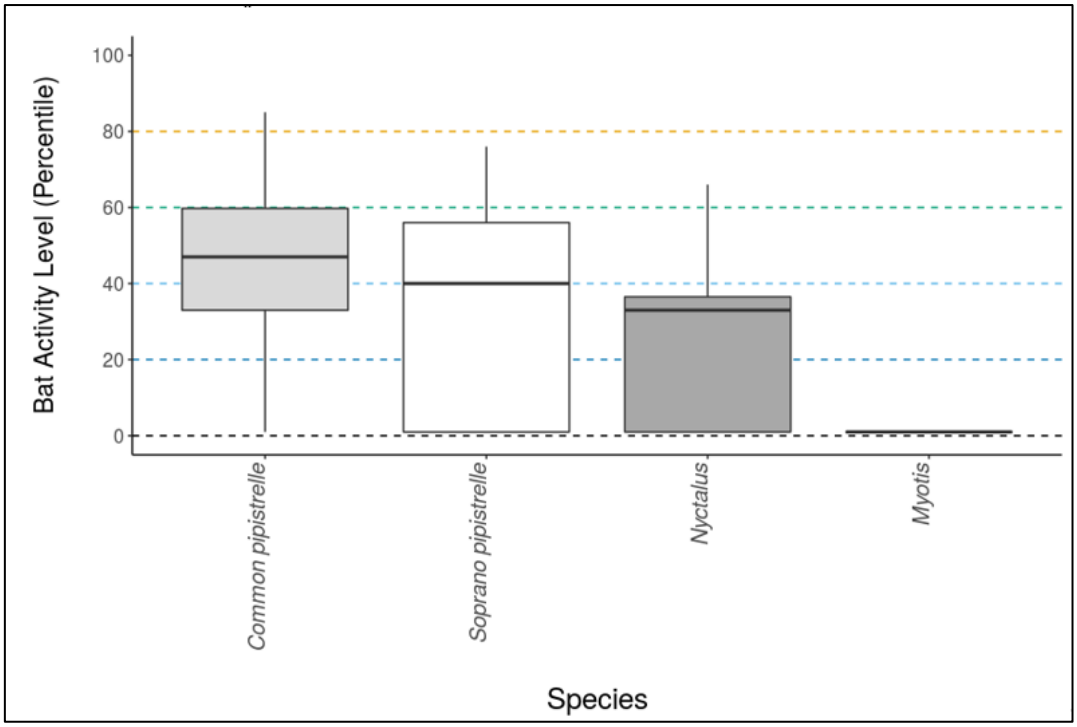

Chart 6-2: Average Annual Site Activity Levels 2020[3]

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

Table 6-3 details the collision risk, population relative abundance and potential vulnerability of the bat species recorded within the site.

Table 6-3: Collision Risk, Population Relative Abundance and Potential Vulnerability.

Bat Species	Collision Risk	Population Relative Abundance	Potential Vulnerability
Common pipistrelle	High	Common	Medium
Soprano pipistrelle	High	Common	Medium
Nyctalus spp.	High	Rarest	High
Daubenton's	Low	Rarer	Low
Myotis spp.	Low	Rarer	Low
Brown long-eared	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 4-5). The Proposed Development consists of 21 turbines that are over 50 m in height, and so falls within the upper category of 'Medium' project size which is between 10 to 40 turbines, as shown in Table 4-5 and Table C-1 of Annex C.

In terms of habitat risk for bats, there are buildings and trees with low, moderate and high bat roosting potential within the study area. There are burns of different sizes within the study area, providing connectivity and foraging habitats throughout the site and the surrounding landscape. The habitat consists of closed plantation with open habitats such as tracks rides and openings, which could be used by foraging bats. The foraging, connectivity and roosting potential of the site results in a habitat risk classification of 'Moderate', as shown in Table 4-5 and Table C-1 of Annex C.

According to Table 4-5 above and Table C-1 of Annex C, the 'Medium' project size combined with a 'Moderate' habitat risk level results in an overall site risk assessment of 'Medium' (3), in accordance with Table 4-5 above and in Table C-1 of Annex C.

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 within the site. Low-risk species (*Myotis* spp. and Daubenton's bat) have low collision risk, so the impact of the Proposed Development on the local bat population would likely be negligible. The overall risk assessment involves multiplying the site's risk level (Section 4.3.5, Table 4-5) with the median and the maximum Ecobat activity levels (Section 4.3.1,Table 4-1) to calculate both the typical site risk level, and the maximum site risk level.

Table 6-4Table 6-2, details the overall level of risk for all high-risk species. The overall risk scores in 2019 for all high collision risk species was 'Medium' (9 - 12), while the overall site risk score based on maximum Ecobat activity levels was 'High' (15). In 2020 the overall risk score was 'Medium' (6 - 9),

while the overall site risk score based on maximum Ecobat activity levels was 'High' (15) for common pipistrelle and 'Medium' (12) for both soprano pipistrelle and *Nyctalus* spp.

Table 6-4: Risk Assessment Scores Based on Median and Maximum Percentiles for High Collision Risk Species (2019 and 2020)

Species	Survey period	Risk Assessment Score based on Median Percentile	Risk Assessment Score based on Max. Percentile
Common pipistrelle	2019	Medium (12)	High (15)
Soprano pipistrelle	2019	Medium (12)	High (15)
Nyctalus spp.	2019	Medium (9)	High (15)
Common pipistrelle	2020	Medium (9)	High (15)
Soprano pipistrelle	2020	Medium (6)	Medium (12)
Nyctalus spp.	2020	Medium (6)	Medium (12)

To provide an indication how activity varies across the year by species,

Table 6-5 shows the % of sample locations where a medium percentile 'High' risk assessment score was recorded. Using this method, June, July and August appear to be the three months with greater risk.

Figures 7.9 to 7.11 presents the overall median monthly risk assessment scores for high collision risk bat species at the various sample locations.

Data on the monthly activity levels per location is also provided in Table E-1 of Annex E.

Table 6-5: The Percentage of Locations with High-Risk Assessment Scores based on Median Percentiles for High Collision Risk Species

	Species	June	July	August	September
Median Percentile	Common pipistrelle	23%	23%	15%	8%
	Soprano pipistrelle	15%	23%	23%	8%
	Nyctalus spp.	8%	0%	0%	0%

Green - 0, Yellow - 1-33%, Amber 34-66%, Red - 67-100%

7 REFERENCES

Collins, J. (ed) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

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

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

Scottish Natural Heritage, Natural England, Natural Resources Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT). (2019). Bats and Onshore Wind Turbines: Survey Assessment and Mitigation.

ANNEX A. PROTECTED SPECIES LEGAL STATUS

All bat species receive protection under the Conservation Regulations (1994) (as amended).

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

It is an offence to:

- Deliberately or recklessly to capture, injure or kill a wild animal of a European protected species;
- Deliberately or recklessly:
  - Harass a wild animal or group of wild animals of a European protected species;
  - Disturb such an animal while it is occupying a structure or place which it uses for shelter or protection;
  - Disturb such an animal while it is rearing or otherwise caring for its young;
  - To obstruct access to a breeding site or resting place of such an animal, or otherwise to deny the animal use of the breeding site or resting place (i.e. roost sites);
  - To disturb such an animal in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of the species to which it belongs; or
  - To disturb such an animal in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young;
- To damage or destroy a breeding site or resting place of such an animal.

Table A-1 Legal and Conservation Status of all UK Bats[4]

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 for more details.

[4] Source: Bat Conservation Trust http://www.bats.org.uk/pages/bats_and_the_law.html

ANNEX B. SURVEY TIMINGS & ANABAT LOCATIONS

Table B-1 Summary of Temporal Survey Effort

Survey Date	Locations	Total Number of Complete Nights
June 21/06/2019 – July 01/07/2019	1	10
	2	10
	3	10
	4	10
	5	10
	6	10
	7	10
	8	10
	9	10
	9R*	10
	10	10
	11	10
	12	10
	13	10
July 24/07/19 – August 19/08/19	1	20
	2	17
	3	20
	4	25
	5	16
	6	24
	7	20
	8	26
	9	20
	9R*	26
	10	20
	11	20
	12	19
	13	19
August 19/08/19 – September 02/09/19	1	14
	2	14
	3	6
	4	14
	5	12
	6	14
	7	14
	8	14

Survey Date	Locations	Total Number of Complete Nights
	9	14
	9R*	14
	10	14
	11	14
	12	14
	13	14
Total	-	**618**
July 31/07/2020 – August 26/08/2020	14	26
	15	26
Total	**-**	**52**

* Location 9R is not included in the total number of nights as this detector was at the same location as location 98 and was used as a reference detector to determine the variability of detectability between a zero-crossing detector (Express) and a full spectrum detector (Swift).

Table B-2 Description of Anabat Locations

Location	Easting	Northing	Bearing	Habitat
1	274622	632958	170	Open clear-fell
2	273781	633399	120	Open moorland
3	274562	633591	240	Immature plantation
4	275273	634020	130	Open clear-fell
5	273928	634053	120	Recent clear-fell
6	274900	634077	40	Plantation edge and immature planation
7	275348	634607	40	Near plantation edge, track and small pond
8	275197	635107	120	Open ride
9	275864	635264	160	Near path, open clear-fell
9R	275864	635264	160	Near path, open clear-fell
10	276233	634949	210	Clear-fell
11	276819	634861	200	Immature planation
12	277041	635562	280	Immature plantation, planation edge and track
13	276534	635629	200	Clear-fell

Location	Easting	Northing	Bearing	Habitat
14	276734	634310	90	Adjacent to immature plantation by <1m and grazing pasture
15	276762	633841	180	Immature plantation <1m away

ANNEX C. INITIAL SITE RISK ASSESSMENT

Table C-1 Initial Site Risk Assessment[5].

Site Risk Level (1-5)6	Project Size			
Habitat Risk		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				

Habitat Risk	Description
Low	Small number of potential roost features, of low quality. Low-quality forging 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 liner 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 10km. Comprising turbines <50m in height.
Medium	Larger developments (between 10 and 40). May have some other wind development within 5km. Comprising turbines 50 – 100m in height.
Large	Largest developments (>40 turbines) with other wind energy developments within 5km. Comprising turbines >100m in height.

[5] Sourced from: Scottish Natural Heritage, Natural England, Natural Resources Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT). (2019). *Bats and Onshore Wind Turbines: Survey Assessment and Mitigation*.

[6] 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

ID	Feature	Notes	Classification	Grid Reference
T002	Building	Derelict bungalow farmhouse building with harling and a slate roof. Gaps under slate tiles and broken window. Swallows nesting in building. Adjacent kennel building with PRFs.	Moderate	NS 77079 34368
BT10	Beech tree	Beech trees with no PRF located from ground survey. Trees are of a maturity and a size which may harbour PRFs therefore given low potential category.	Low	NS 76985 34267
T004	Beech tree	Cavity wound at 2 m.	Moderate	NS 76982 34263
T005	Beech tree	Butt rot cavity running from the ground to 1.2 m with cavity within trunk.	Moderate	NS 76935 34218
BT9	Beech tree	Beech trees with no PRF located from ground survey. Trees are of a maturity and a size which may harbour PRFs therefore given low potential category.	Low	NS 76953 34296
T007	Scots Pine tree	Recent tear out with potential cavity.	Moderate	NS 76970 34291
BT7	Beech tree	Line of beech trees with some PRFs present. Trees are also of a maturity and a size which may harbour PRFs therefore given low potential category.	Low	NS 76995 34334
T009	Beech tree	Branch union at 7 m.	Moderate	NS 76986 34343
T010	Scots Pine tree	Tear out cavity on scots pine at 7 m.	Moderate	NS 76977 34403
BT6	Beech tree	Beech trees with no PRF located from ground survey. Trees are of a maturity and a size which may harbour PRFs therefore given low potential category.	Low	NS 76961 34406
T012	Beech tree	Beech tree with tear out on branch at 4.5 m.	Moderate	NS 76960 34417
T013	Scots Pine tree	Dead tree with crumbling bark and woodpecker holes. Advance decay of tree reducing likelihood of PRF supporting a bat.	Moderate	NS 76992 34426
BT3	Beech tree	Beech trees with no PRFs located from ground survey. Trees are of a maturity and a size which may harbour PRFs therefore given low potential category.	Low	NS 76966 34443
BT2	Beech tree	Line of beech trees with no PRFs from ground survey but of a maturity and a size which may harbour PFR therefore categorised as low potential.	Low	NS 77021 34469
T016	Beech tree	Beech tree with butt rot cavity running from ground to 1.5 m.	Moderate	NS 76991 34467
BT1	Scots Pine tree	Collection of six scots pine trees with high to moderate PRF. Few anchor points at height. Birds' nests in two trees.	High	NS 76989 34459
T018	Building	Old building with a small section of the tile roof remaining. Stone walls with exterior harling exposed and crumbling. Some gaps in brickwork and under tiles. Due to dilapidated nature of the buildings and the PRFs identified the structure has been classed as low potential.	Low	NS 76199 34344

ANNEX E. MONTHLY LOCATION SPECIFIC DATA

Table E-1 Monthly Location Specific Data for High Collision Risk Species

Location ID	Species	Month	Median Percentile	Median Activity Category (Taken from Table 4-1)	Maximum Percentile	Maximum Activity Category (Taken from Table 4-1)	Site Risk (Taken from Table 4-5)	Overall Median Category Score (Taken from Table 4-6)	Overall Median Category Score	Overall Maximum Category Score (Taken from Table 4-6)	Overall Maximum Category Score
1	*Myotis*	Jun	16	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
1	*Myotis*	Jul	30	Low-Moderate	30	Low-Moderate	3	**6**	**Medium**	**6**	**Medium**
1	*Myotis*	Aug	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
1	*Myotis daubentonii*	Jun	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
1	*Nyctalus*	Jun	16	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
1	*Nyctalus*	Jul	30	Low-Moderate	30	Low-Moderate	3	**6**	**Medium**	**6**	**Medium**
1	*Nyctalus*	Aug	30	Low-Moderate	69	Moderate-High	3	**6**	**Medium**	**12**	**Medium**
1	*Pipistrellus pipistrellus*	Jun	37	Low-Moderate	51	Moderate	3	**6**	**Medium**	**9**	**Medium**
1	*Pipistrellus pipistrellus*	Jul	30	Low-Moderate	30	Low-Moderate	3	**6**	**Medium**	**6**	**Medium**
1	*Pipistrellus pipistrellus*	Aug	51	Moderate	64	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
1	*Pipistrellus pygmaeus*	Jun	1	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
1	*Pipistrellus pygmaeus*	Jul	1	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
1	*Pipistrellus pygmaeus*	Aug	44	Moderate	70	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
2	*Myotis*	Aug	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
2	*Nyctalus*	Jun	44	Moderate	44	Moderate	3	**9**	**Medium**	**9**	**Medium**
2	*Nyctalus*	Jul	16	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
2	*Nyctalus*	Aug	30	Low-Moderate	83	High	3	**6**	**Medium**	**15**	**High**
2	*Pipistrellus pipistrellus*	Jun	26	Low-Moderate	51	Moderate	3	**6**	**Medium**	**9**	**Medium**
2	*Pipistrellus pipistrellus*	Aug	16	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
2	*Pipistrellus pygmaeus*	Jun	31	Low-Moderate	61	Moderate-High	3	**6**	**Medium**	**12**	**Medium**
2	*Pipistrellus pygmaeus*	Jul	30	Low-Moderate	30	Low-Moderate	3	**6**	**Medium**	**6**	**Medium**
2	*Pipistrellus pygmaeus*	Aug	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
3	*Myotis*	Aug	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
3	*Nyctalus*	Jul	1	Low	44	Moderate	3	**3**	**Low**	**9**	**Medium**
3	*Nyctalus*	Aug	30	Low-Moderate	79	Moderate-High	3	**6**	**Medium**	**12**	**Medium**

Location ID	Species	Month	Median Percentile	Median Activity Category (Taken from Table 4-1)	Maximum Percentile	Maximum Activity Category (Taken from Table 4-1)	Site Risk (Taken from Table 4-5)	Overall Median Category Score (Taken from Table 4-6)	Overall Median Category Score	Overall Maximum Category Score (Taken from Table 4-6)	Overall Maximum Category Score
3	*Pipistrellus pipistrellus*	Jun	26	Low-Moderate	51	Moderate	3	**6**	**Medium**	**9**	**Medium**
3	*Pipistrellus pipistrellus*	Jul	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
3	*Pipistrellus pipistrellus*	Aug	1	Low	44	Moderate	3	**3**	**Low**	**9**	**Medium**
3	*Pipistrellus pygmaeus*	Jun	23	Low-Moderate	44	Moderate	3	**6**	**Medium**	**9**	**Medium**
3	*Pipistrellus pygmaeus*	Jul	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
3	*Pipistrellus pygmaeus*	Aug	1	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
3	*Plecotus auritus*	Aug	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
4	*Myotis*	Jun	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
4	*Myotis*	Aug	1	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
4	*Myotis*	Sep	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
4	*Nyctalus*	Jun	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
4	*Nyctalus*	Jul	1	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
4	*Nyctalus*	Aug	44	Moderate	75	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
4	*Pipistrellus pipistrellus*	Jun	44	Moderate	57	Moderate	3	**9**	**Medium**	**9**	**Medium**
4	*Pipistrellus pipistrellus*	Jul	1	Low	57	Moderate	3	**3**	**Low**	**9**	**Medium**
4	*Pipistrellus pipistrellus*	Aug	72	Moderate-High	99	High	3	**12**	**Medium**	**15**	**High**
4	*Pipistrellus pygmaeus*	Jun	37	Low-Moderate	61	Moderate-High	3	**6**	**Medium**	**12**	**Medium**
4	*Pipistrellus pygmaeus*	Jul	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
4	*Pipistrellus pygmaeus*	Aug	80	High	100	High	3	**15**	**High**	**15**	**High**
5	*Myotis*	Jun	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
5	*Myotis*	Jul	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
5	*Myotis*	Aug	1	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
5	*Nyctalus*	Jun	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
5	*Nyctalus*	Jul	30	Low-Moderate	44	Moderate	3	**6**	**Medium**	**9**	**Medium**
5	*Nyctalus*	Aug	16	Low	80	Moderate-High	3	**3**	**Low**	**12**	**Medium**
5	*Pipistrellus pipistrellus*	Jun	16	Low	57	Moderate	3	**3**	**Low**	**9**	**Medium**
5	*Pipistrellus pipistrellus*	Jul	81	High	87	High	3	**15**	**High**	**15**	**High**

Location ID	Species	Month	Median Percentile	Median Activity Category (Taken from Table 4-1)	Maximum Percentile	Maximum Activity Category (Taken from Table 4-1)	Site Risk (Taken from Table 4-5)	Overall Median Category Score (Taken from Table 4-6)	Overall Median Category Score	Overall Maximum Category Score (Taken from Table 4-6)	Overall Maximum Category Score
5	*Pipistrellus pipistrellus*	Aug	37	Low-Moderate	70	Moderate-High	3	**6**	**Medium**	**12**	**Medium**
5	*Pipistrellus pygmaeus*	Jun	23	Low-Moderate	67	Moderate-High	3	**6**	**Medium**	**12**	**Medium**
5	*Pipistrellus pygmaeus*	Jul	83	High	89	High	3	**15**	**High**	**15**	**High**
5	*Pipistrellus pygmaeus*	Aug	57	Moderate	81	High	3	**9**	**Medium**	**15**	**High**
6	*Myotis*	Jun	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
6	*Myotis*	Aug	1	Low	44	Moderate	3	**3**	**Low**	**9**	**Medium**
6	*Myotis*	Sep	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
6	*Nyctalus*	Jun	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
6	*Nyctalus*	Jul	1	Low	51	Moderate	3	**3**	**Low**	**9**	**Medium**
6	*Nyctalus*	Aug	30	Low-Moderate	76	Moderate-High	3	**6**	**Medium**	**12**	**Medium**
6	*Pipistrellus pipistrellus*	Jun	16	Low	88	High	3	**3**	**Low**	**15**	**High**
6	*Pipistrellus pipistrellus*	Jul	30	Low-Moderate	76	Moderate-High	3	**6**	**Medium**	**12**	**Medium**
6	*Pipistrellus pipistrellus*	Aug	57	Moderate	83	High	3	**9**	**Medium**	**15**	**High**
6	*Pipistrellus pygmaeus*	Jun	44	Moderate	78	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
6	*Pipistrellus pygmaeus*	Jul	62	Moderate-High	79	Moderate-High	3	**12**	**Medium**	**12**	**Medium**
6	*Pipistrellus pygmaeus*	Aug	57	Moderate	86	High	3	**9**	**Medium**	**15**	**High**
6	*Plecotus auritus*	Aug	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
7	*Myotis*	Jun	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
7	*Myotis*	Jul	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
7	*Myotis*	Aug	1	Low	57	Moderate	3	**3**	**Low**	**9**	**Medium**
7	*Nyctalus*	Jun	51	Moderate	51	Moderate	3	**9**	**Medium**	**9**	**Medium**
7	*Nyctalus*	Jul	37	Low-Moderate	44	Moderate	3	**6**	**Medium**	**9**	**Medium**
7	*Nyctalus*	Aug	44	Moderate	61	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
7	*Pipistrellus pipistrellus*	Jun	87	High	98	High	3	**15**	**High**	**15**	**High**
7	*Pipistrellus pipistrellus*	Jul	67	Moderate-High	86	High	3	**12**	**Medium**	**15**	**High**
7	*Pipistrellus pipistrellus*	Aug	76	Moderate-High	94	High	3	**12**	**Medium**	**15**	**High**
7	*Pipistrellus pipistrellus*	Sep	69	Moderate-High	69	Moderate-High	3	**12**	**Medium**	**12**	**Medium**

Location ID	Species	Month	Median Percentile	Median Activity Category (Taken from Table 4-1)	Maximum Percentile	Maximum Activity Category (Taken from Table 4-1)	Site Risk (Taken from Table 4-5)	Overall Median Category Score (Taken from Table 4-6)	Overall Median Category Score	Overall Maximum Category Score (Taken from Table 4-6)	Overall Maximum Category Score
7	*Pipistrellus pygmaeus*	Jun	73	Moderate-High	91	High	3	**12**	**Medium**	**15**	**High**
7	*Pipistrellus pygmaeus*	Jul	70	Moderate-High	90	High	3	**12**	**Medium**	**15**	**High**
7	*Pipistrellus pygmaeus*	Aug	76	Moderate-High	96	High	3	**12**	**Medium**	**15**	**High**
7	*Pipistrellus pygmaeus*	Sep	64	Moderate-High	64	Moderate-High	3	**12**	**Medium**	**12**	**Medium**
8	*Myotis*	Jun	72	Moderate-High	76	Moderate-High	3	**12**	**Medium**	**12**	**Medium**
8	*Myotis*	Jul	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
8	*Myotis*	Aug	37	Low-Moderate	77	Moderate-High	3	**6**	**Medium**	**12**	**Medium**
8	*Myotis*	Sep	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
8	*Myotis daubentonii*	Jun	37	Low-Moderate	51	Moderate	3	**6**	**Medium**	**9**	**Medium**
8	*Myotis daubentonii*	Jul	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
8	*Myotis daubentonii*	Aug	16	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
8	*Nyctalus*	Jun	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
8	*Nyctalus*	Jul	37	Low-Moderate	44	Moderate	3	**6**	**Medium**	**9**	**Medium**
8	*Nyctalus*	Aug	30	Low-Moderate	57	Moderate	3	**6**	**Medium**	**9**	**Medium**
8	*Pipistrellus pipistrellus*	Jun	69	Moderate-High	82	High	3	**12**	**Medium**	**15**	**High**
8	*Pipistrellus pipistrellus*	Jul	77	Moderate-High	87	High	3	**12**	**Medium**	**15**	**High**
8	*Pipistrellus pipistrellus*	Aug	78	Moderate-High	98	High	3	**12**	**Medium**	**15**	**High**
8	*Pipistrellus pipistrellus*	Sep	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
8	*Pipistrellus pygmaeus*	Jun	64	Moderate-High	78	Moderate-High	3	**12**	**Medium**	**12**	**Medium**
8	*Pipistrellus pygmaeus*	Jul	75	Moderate-High	82	High	3	**12**	**Medium**	**15**	**High**
8	*Pipistrellus pygmaeus*	Aug	79	Moderate-High	98	High	3	**12**	**Medium**	**15**	**High**
8	*Pipistrellus pygmaeus*	Sep	61	Moderate-High	61	Moderate-High	3	**12**	**Medium**	**12**	**Medium**
9	*Myotis*	Jun	16	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
9	*Myotis*	Jul	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
9	*Myotis*	Aug	1	Low	44	Moderate	3	**3**	**Low**	**9**	**Medium**
9	*Myotis daubentonii*	Jun	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
9	*Myotis daubentonii*	Aug	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**

Location ID	Species	Month	Median Percentile	Median Activity Category (Taken from Table 4-1)	Maximum Percentile	Maximum Activity Category (Taken from Table 4-1)	Site Risk (Taken from Table 4-5)	Overall Median Category Score (Taken from Table 4-6)	Overall Median Category Score	Overall Maximum Category Score (Taken from Table 4-6)	Overall Maximum Category Score
9	*Nyctalus*	Jun	48	Moderate	57	Moderate	3	**9**	**Medium**	**9**	**Medium**
9	*Nyctalus*	Jul	30	Low-Moderate	51	Moderate	3	**6**	**Medium**	**9**	**Medium**
9	*Nyctalus*	Aug	44	Moderate	64	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
9	*Nyctalus*	Sep	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
9	*Pipistrellus pipistrellus*	Jun	65	Moderate-High	70	Moderate-High	3	**12**	**Medium**	**12**	**Medium**
9	*Pipistrellus pipistrellus*	Jul	64	Moderate-High	64	Moderate-High	3	**12**	**Medium**	**12**	**Medium**
9	*Pipistrellus pipistrellus*	Aug	69	Moderate-High	99	High	3	**12**	**Medium**	**15**	**High**
9	*Pipistrellus pipistrellus*	Sep	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
9	*Pipistrellus pygmaeus*	Jun	57	Moderate	76	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
9	*Pipistrellus pygmaeus*	Jul	57	Moderate	87	High	3	**9**	**Medium**	**15**	**High**
9	*Pipistrellus pygmaeus*	Aug	76	Moderate-High	99	High	3	**12**	**Medium**	**15**	**High**
9	*Pipistrellus pygmaeus*	Sep	44	Moderate	44	Moderate	3	**9**	**Medium**	**9**	**Medium**
9	*Plecotus auritus*	Aug	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
10	*Myotis*	Jun	44	Moderate	64	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
10	*Myotis*	Jul	1	Low	61	Moderate-High	3	**3**	**Low**	**12**	**Medium**
10	*Myotis*	Aug	37	Low-Moderate	88	High	3	**6**	**Medium**	**15**	**High**
10	*Myotis daubentonii*	Jun	30	Low-Moderate	30	Low-Moderate	3	**6**	**Medium**	**6**	**Medium**
10	*Nyctalus*	Jun	56	Moderate	79	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
10	*Nyctalus*	Jul	61	Moderate-High	64	Moderate-High	3	**12**	**Medium**	**12**	**Medium**
10	*Nyctalus*	Aug	51	Moderate	82	High	3	**9**	**Medium**	**15**	**High**
10	*Pipistrellus pipistrellus*	Jun	90	High	96	High	3	**15**	**High**	**15**	**High**
10	*Pipistrellus pipistrellus*	Jul	84	High	93	High	3	**15**	**High**	**15**	**High**
10	*Pipistrellus pipistrellus*	Aug	91	High	98	High	3	**15**	**High**	**15**	**High**
10	*Pipistrellus pipistrellus*	Sep	51	Moderate	51	Moderate	3	**9**	**Medium**	**9**	**Medium**
10	*Pipistrellus pygmaeus*	Jun	81	High	93	High	3	**15**	**High**	**15**	**High**
10	*Pipistrellus pygmaeus*	Jul	90	High	94	High	3	**15**	**High**	**15**	**High**
10	*Pipistrellus pygmaeus*	Aug	90	High	99	High	3	**15**	**High**	**15**	**High**

Location ID	Species	Month	Median Percentile	Median Activity Category (Taken from Table 4-1)	Maximum Percentile	Maximum Activity Category (Taken from Table 4-1)	Site Risk (Taken from Table 4-5)	Overall Median Category Score (Taken from Table 4-6)	Overall Median Category Score	Overall Maximum Category Score (Taken from Table 4-6)	Overall Maximum Category Score
10	*Pipistrellus pygmaeus*	Sep	75	Moderate-High	75	Moderate-High	3	**12**	**Medium**	**12**	**Medium**
10	*Plecotus auritus*	Jun	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
11	*Myotis*	Jul	1	Low	44	Moderate	3	**3**	**Low**	**9**	**Medium**
11	*Myotis*	Aug	1	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
11	*Myotis daubentonii*	Jun	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
11	*Nyctalus*	Jun	41	Moderate	51	Moderate	3	**9**	**Medium**	**9**	**Medium**
11	*Nyctalus*	Jul	44	Moderate	51	Moderate	3	**9**	**Medium**	**9**	**Medium**
11	*Nyctalus*	Aug	48	Moderate	90	High	3	**9**	**Medium**	**15**	**High**
11	*Nyctalus*	Sep	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
11	*Pipistrellus pipistrellus*	Jun	61	Moderate-High	73	Moderate-High	3	**12**	**Medium**	**12**	**Medium**
11	*Pipistrellus pipistrellus*	Jul	70	Moderate-High	76	Moderate-High	3	**12**	**Medium**	**12**	**Medium**
11	*Pipistrellus pipistrellus*	Aug	68	Moderate-High	92	High	3	**12**	**Medium**	**15**	**High**
11	*Pipistrellus pipistrellus*	Sep	51	Moderate	51	Moderate	3	**9**	**Medium**	**9**	**Medium**
11	*Pipistrellus pygmaeus*	Jun	30	Low-Moderate	57	Moderate	3	**6**	**Medium**	**9**	**Medium**
11	*Pipistrellus pygmaeus*	Jul	30	Low-Moderate	67	Moderate-High	3	**6**	**Medium**	**12**	**Medium**
11	*Pipistrellus pygmaeus*	Aug	67	Moderate-High	92	High	3	**12**	**Medium**	**15**	**High**
11	*Pipistrellus pygmaeus*	Sep	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
11	*Plecotus auritus*	Aug	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
12	*Myotis*	Jul	30	Low-Moderate	30	Low-Moderate	3	**6**	**Medium**	**6**	**Medium**
12	*Myotis*	Aug	30	Low-Moderate	51	Moderate	3	**6**	**Medium**	**9**	**Medium**
12	*Myotis*	Sep	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
12	*Nyctalus*	Jun	83	High	94	High	3	**15**	**High**	**15**	**High**
12	*Nyctalus*	Jul	44	Moderate	67	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
12	*Nyctalus*	Aug	61	Moderate-High	73	Moderate-High	3	**12**	**Medium**	**12**	**Medium**
12	*Nyctalus*	Sep	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
12	*Pipistrellus pipistrellus*	Jun	1	Low	67	Moderate-High	3	**3**	**Low**	**12**	**Medium**
12	*Pipistrellus pipistrellus*	Jul	30	Low-Moderate	64	Moderate-High	3	**6**	**Medium**	**12**	**Medium**

Location ID	Species	Month	Median Percentile	Median Activity Category (Taken from Table 4-1)	Maximum Percentile	Maximum Activity Category (Taken from Table 4-1)	Site Risk (Taken from Table 4-5)	Overall Median Category Score (Taken from Table 4-6)	Overall Median Category Score	Overall Maximum Category Score (Taken from Table 4-6)	Overall Maximum Category Score
12	*Pipistrellus pipistrellus*	Aug	48	Moderate	89	High	3	**9**	**Medium**	**15**	**High**
12	*Pipistrellus pygmaeus*	Jun	51	Moderate	67	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
12	*Pipistrellus pygmaeus*	Jul	51	Moderate	61	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
12	*Pipistrellus pygmaeus*	Aug	67	Moderate-High	98	High	3	**12**	**Medium**	**15**	**High**
12	*Pipistrellus pygmaeus*	Sep	30	Low-Moderate	30	Low-Moderate	3	**6**	**Medium**	**6**	**Medium**
13	*Myotis*	Jun	1	Low	44	Moderate	3	**3**	**Low**	**9**	**Medium**
13	*Myotis*	Jul	30	Low-Moderate	57	Moderate	3	**6**	**Medium**	**9**	**Medium**
13	*Myotis*	Aug	48	Moderate	73	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
13	*Myotis*	Sep	64	Moderate-High	64	Moderate-High	3	**12**	**Medium**	**12**	**Medium**
13	*Myotis daubentonii*	Jul	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
13	*Myotis daubentonii*	Aug	1	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
13	*Nyctalus*	Jun	72	Moderate-High	89	High	3	**12**	**Medium**	**15**	**High**
13	*Nyctalus*	Jul	30	Low-Moderate	72	Moderate-High	3	**6**	**Medium**	**12**	**Medium**
13	*Nyctalus*	Aug	51	Moderate	70	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
13	*Nyctalus*	Sep	57	Moderate	57	Moderate	3	**9**	**Medium**	**9**	**Medium**
13	*Pipistrellus pipistrellus*	Jun	86	High	97	High	3	**15**	**High**	**15**	**High**
13	*Pipistrellus pipistrellus*	Jul	90	High	99	High	3	**15**	**High**	**15**	**High**
13	*Pipistrellus pipistrellus*	Aug	89	High	97	High	3	**15**	**High**	**15**	**High**
13	*Pipistrellus pipistrellus*	Sep	83	High	83	High	3	**15**	**High**	**15**	**High**
13	*Pipistrellus pygmaeus*	Jun	83	High	94	High	3	**15**	**High**	**15**	**High**
13	*Pipistrellus pygmaeus*	Jul	90	High	97	High	3	**15**	**High**	**15**	**High**
13	*Pipistrellus pygmaeus*	Aug	90	High	98	High	3	**15**	**High**	**15**	**High**
13	*Pipistrellus pygmaeus*	Sep	82	High	82	High	3	**15**	**High**	**15**	**High**
13	*Plecotus auritus*	Jun	1	Low	30	Low-Moderate	3	**3**	**Low**	**6**	**Medium**
13	*Plecotus auritus*	Aug	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
14	*Myotis*	Aug	1	Low	1	Low	3	**3**	**Low**	3	**Low**
14	*Nyctalus*	Jul	33	Low-Moderate	33	Low-Moderate	3	**6**	**Medium**	**6**	**Medium**

Location ID	Species	Month	Median Percentile	Median Activity Category (Taken from Table 4-1)	Maximum Percentile	Maximum Activity Category (Taken from Table 4-1)	Site Risk (Taken from Table 4-5)	Overall Median Category Score (Taken from Table 4-6)	Overall Median Category Score	Overall Maximum Category Score (Taken from Table 4-6)	Overall Maximum Category Score
14	*Nyctalus*	Aug	33	Low-Moderate	66	Moderate-High	3	**6**	**Medium**	**12**	**Medium**
14	*Pipistrellus pipistrellus*	Jul	33	Low-Moderate	33	Low-Moderate	3	**6**	**Medium**	**6**	**Medium**
14	*Pipistrellus pipistrellus*	Aug	47	Moderate	85	High	3	**9**	**Medium**	**15**	**High**
14	*Pipistrellus pygmaeus*	Aug	47	Moderate	76	Moderate-High	3	**9**	**Medium**	**12**	**Medium**
15	*Myotis*	Aug	1	Low	1	Low	3	**3**	**Low**	**3**	**Low**
15	*Nyctalus*	Aug	17	Low	47	Moderate	3	**3**	**Low**	**9**	**Medium**
15	*Pipistrellus pipistrellus*	Aug	33	Low-Moderate	61	Moderate-High	3	**6**	**Medium**	**12**	**Medium**
15	*Pipistrellus pygmaeus*	Aug	1	Low	56	Moderate	3	**3**	**Low**	**9**	**Medium**